

**ORDINANCE NO. 16-1016**

AN ORDINANCE of the City Council of the City of SeaTac, Washington, amending Chapter 15.700 of the SeaTac Municipal Code related to Critical Areas.

**WHEREAS**, RCW 36.70A, the Growth Management Act, requires that each comprehensive land use plan and development regulations be subject to continuing review and evaluation by the county or city that adopted them and periodically, requires a major update to ensure consistency with State law (RCW 36.70A.130); and

**WHEREAS**, the City of SeaTac adopted a major update to its Comprehensive Plan in June, 2015 consistent with RCW 36.70A; and

**WHEREAS**, certain development regulations pertaining to critical areas are required to be amended to implement the Comprehensive Plan's policies and to be consistent with state laws and administrative codes; and

**WHEREAS**, the city received correspondence in 2015 from the Department of Ecology noting that some of our development regulations relating to critical areas are out of compliance with state law; and

**WHEREAS**, amendments to those development regulations were developed using Washington Department of Ecology and Department of Commerce guidance documents, representing the Best Available Science, as references; and

**WHEREAS**, no known critical aquifer recharge areas have been mapped in the City by the water purveyors, this Ordinance therefore addresses the requirements of state law through wellhead protection and general groundwater protection; and

**WHEREAS**, the environmental impacts of the proposed amendments have been assessed, a Determination of Nonsignificance, File No. SEP16-0003, was issued April 19, 2016 and no appeals were filed; and

**WHEREAS**, after a duly-noticed public hearing on May 3, 2016 to consider proposed amendments to the development regulations, the Planning Commission recommended to the City Council adoption of the proposed amendments to the development regulations; and

**WHEREAS**, a draft of these proposed amendments was filed with the Washington Department of Commerce not less than sixty days prior to final action, pursuant to RCW 36.70A.106 and WAC 365-195-620 and no official response was received; and

**WHEREAS**, at their May 24, 2016 Council Study Session, the City Council sent the Planning Commission's draft to the Land Use and Parks (LUP) Committee for further review; and;

**WHEREAS**, the LUP Committee recommended additional changes to the Planning Commission's draft as represented in Exhibit B to this Ordinance; and

**WHEREAS**, The City is accepting the proposed amendments in order to meet Department of Ecology guidelines by the extended deadline of September 30, 2016, and may continue to review this chapter of the SeaTac Municipal Code, and may recommend further amendments in the future; and

**WHEREAS**, all of the foregoing recitals are deemed by the City Council to be findings of fact;

**NOW, THEREFORE, THE CITY COUNCIL OF THE CITY OF SEATAC, WASHINGTON DO ORDAIN as follows:**

**Section 1.** SeaTac Municipal Code Chapter 15.700 is hereby amended as set forth in Exhibit B.

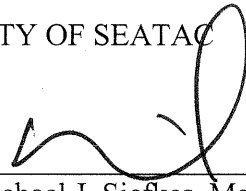
**Section 2.** The City Clerk is directed to transmit a complete and accurate copy of this Ordinance to the Washington Department of Commerce, Growth Management Services Division within ten days after final adoption, pursuant to RCW 36.70A.106 and WAC 365-195-620. The City Clerk is further directed to transmit a copy of this Ordinance to the King County Assessor by the ensuing 31<sup>st</sup> day of July, pursuant to RCW 35A.63.260.

**Section 3.** If any provision of this ordinance or its application to any person or circumstance is held invalid, the remainder of the ordinance or the application of the provision to other persons or circumstances shall not be affected.

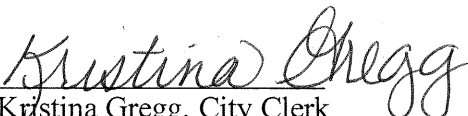
**Section 4.** This Ordinance shall be in full force and effect five (5) days after passage and publication.

ADOPTED this 27<sup>th</sup> day of September, 2016 and signed in authentication thereof this 27<sup>th</sup> day of September, 2016.

CITY OF SEATAAC

  
Michael J. Siefkes, Mayor

ATTEST:

  
Kristina Gregg, City Clerk

Approved as to Form:

  
Mary Mirante Bartolo, City Attorney

[Effective Date: 10/8/16]

[Critical Areas]

# Exhibit A

## SMC Chapter 15.700

Draft Recommended by the Planning

Commission, 5/17/16

### **Division VII. ~~Environmentally Sensitive~~ Critical Areas**

#### **CHAPTERS:**

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#### **15.700 ~~Environmentally Sensitive~~ Critical Areas**

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## **Chapter 15.700**

### **Environmentally Sensitive Critical Areas**

#### **SECTIONS:**

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- 15.700.260 Seismic Hazard Areas – Development Standards and Permitted Alterations
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  - 15.700.350 Streams – Mitigation Requirements
  - 15.700.360 Wellhead Protection Areas and General Groundwater Resources  
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  - 15.700.370 Fish and Wildlife Habitat Conservation Areas
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#### 15.700.005 Purpose

The purpose of this chapter is to implement the goals and policies of the Washington State Environmental Policy Act, Chapter 43.21C RCW, and the SeaTac Comprehensive Plan which call for protection of the natural environment and the public health and safety by:

- A. Establishing development standards to protect defined ~~sensitive~~ critical areas;
- B. Protecting members of the public, public resources and facilities from injury, loss of life, property damage or financial loss due to flooding, erosion, landslides, seismic and soil subsidence or steep slope failures;
- C. Protecting unique, fragile and valuable elements of the environment including, but not limited to, wildlife and its habitat;
- D. Requiring mitigation of unavoidable impacts on environmentally ~~sensitive~~ critical areas by regulating alterations in or near ~~sensitive~~ critical areas;
- E. Preventing cumulative adverse environmental impacts on water availability, water quality, wetlands and streams;

- F. Measuring the quantity and quality of wetland and stream resources and preventing overall net loss of wetland and stream functions;
- G. Protecting the public trust as to navigable waters and aquatic resources;
- H. Meeting the requirements of the National Flood Insurance Program and maintaining SeaTac as an eligible community for federal flood insurance benefits;
- I. Alerting members of the public including, but not limited to, appraisers, owners, real estate agents, potential buyers or lessees to the development limitations of sensitive-critical areas; and
- J. Providing City officials with sufficient information to protect critical areas.

#### **15.700.010 Authority and Application**

- A. The provisions of this chapter shall apply to all land uses in the City and property owners within the City shall comply with the requirements of this chapter;
- B. The City shall not approve any permit or issue any authorization to alter the condition of any land, water or vegetation or to construct any structure or improvement without first assuring compliance with the requirements of this chapter; and
- C. The provisions of this of this chapter do not apply to any habitat areas which come under the jurisdiction of the Shoreline Management Program.
- ~~D.~~ E. When any provision of any other chapter of the SeaTac Municipal Code conflicts with this chapter or when the provisions of this chapter are in conflict, that provision which provides more protection to environmentally sensitive areas shall apply unless specifically provided otherwise in this chapter or unless such provision conflicts with Federal or State laws or regulations.

#### **15.700.015 Definitions**

##### Alteration

Any human-induced change to an existing condition of a critical area or its buffer. Alterations include, but are not limited to, grading, filling, channelizing, dredging, clearing of vegetation, construction, compaction, excavation, or any other activity that changes the character of the critical area or its buffer.

**Base Flood**

A flood having a one percent (1%) chance of being equaled or exceeded in any given year, often referred to as the “100-year flood.”

**Base Flood Elevation**

The water surface elevation of the base flood in relation to the National Geodetic Vertical Datum of 1929.

**Creation**

The manipulation of the physical, chemical, or biological characteristics to develop a wetland on an upland or deepwater site, where a wetland did not previously exist. Creation results in a gain in wetland acreage and function. A typical action is the excavation of upland soils to elevations that will produce a wetland hydroperiod and hydric soils, and support the growth of hydrophytic plant species

**Critical Drainage Area**

An area which has been formally defined in the City Surface Water Management Program to require more restrictive regulation than is standard in noncritical areas of the City in order to mitigate severe flooding, water quality issues, erosion or sedimentation problems which result from the cumulative impacts of development and urbanization.

**Enhancement**

The manipulation of the physical, chemical, or biological characteristics of a wetland to heighten, intensify, or improve specific function(s) or to change the growth stage or composition of the vegetation present. Enhancement is undertaken for specified purposes such as water quality improvement, flood water retention, or wildlife habitat. Enhancement results in a change in wetland function(s) and can lead to a decline in other wetland functions, but does not result in a gain in wetland acres. Examples are planting vegetation, controlling non-native or invasive species, and modifying site elevations to alter hydroperiods.

**Erosion and Deposition**

The removal of soils and the placement of these removed soils elsewhere by the natural forces of wind and/or water runoff.

**Federal Emergency Management Agency (FEMA) Floodway**

The channel of the stream and that portion of the adjoining floodplain which is necessary to contain and discharge the base flood flow without increasing the base flood elevation more than one (1) foot.

**Flood Fringe**

That portion of the floodplain outside of the zero-rise floodway (See Floodway, Zero-Rise) which is covered by floodwater during the base flood, generally associated with standing water rather than rapidly flowing water.

**Flood Hazard Areas**

Those areas in the City subject to inundation by the base flood including, but not limited to, streams, lakes, wetlands and closed depressions.

**Flood Insurance Rate Map (FIRM)**

The official map on which the Federal Insurance Administration has delineated some of the major areas of flood hazard.

**Flood Insurance Study for King County**

The official report provided by the Federal Insurance Administration which includes flood profiles and the flood insurance rate map.

**Floodplain**

The total area subject to inundation by the base flood.

**Floodproofing**

Adaptations, pursuant to the Building Code, which will make a structure that is below the flood protection elevation substantially impermeable to the passing of water and resistant to hydrostatic and hydrodynamic loads including the impacts of buoyancy.

**Flood Protection Elevation**

An elevation which is one (1) foot above the base flood elevation.

**Floodway, Zero-Rise**

The channel of a stream and that portion of the adjoining floodplain which is necessary to contain and discharge the base flood flow without any measurable increase in flood height. A measurable increase in base flood height means a calculated upward rise in the base flood elevation, equal to or greater than .01 foot, resulting from a comparison of existing conditions and changed conditions directly attributable to development in the floodplain. This definition is broader than that of the FEMA floodway, but always includes the FEMA floodway. The boundaries of the one hundred (100) year floodplains, as shown on the FIRM maps for King County, are considered the boundaries of the zero-rise floodway unless otherwise delineated by a ~~sensitive-critical area report~~special study.

**Functions and Values**

The services provided by critical areas to society, including but not limited to, improving and maintaining water quality, providing fish and wildlife habitat, supporting terrestrial and aquatic food chains, reducing flooding and erosive flows, wave attenuation, historical or archaeological importance, educational opportunities, and recreation.

**Hazardous Production Material (HPM)**

A solid, liquid or gas that has a degree of hazard rating in health, flammability or reactivity of 3 or 4 as ranked by Fire Code Standard No. 79-3 and which is used directly in research, laboratory or production processes which have, as their end product, materials which are not hazardous.

### **Hazardous Substances**

Any solid, liquid, gas or sludge, including any material, substance, product, commodity or waste, regardless of quantity, that exhibits any of the physical, chemical or biological properties described in WAC 173-303-090 or 173-303-100.

### **Mitigation of Environmental Impacts**

The use of any or all of the following actions, listed in descending order of preference:

- ~~\_\_\_\_\_ A. Avoiding the impact by not taking a certain action~~
- ~~\_\_\_\_\_ B. Minimizing the impact by limiting the degree of magnitude of the action by using appropriate technology or by taking affirmative steps to avoid or reduce the impact;~~
- ~~\_\_\_\_\_ C. Rectifying the impact by repairing, rehabilitating or restoring the affected sensitive area or buffer;~~
- ~~\_\_\_\_\_ D. Reducing or eliminating the impact over time by preservation or maintenance operations during the life of the development proposal;~~
- ~~\_\_\_\_\_ E. Compensating for the impact by replacing, enhancing, or providing substitute sensitive areas and environments; and~~
- ~~\_\_\_\_\_ F. Monitoring the impact and taking appropriate corrective measures.~~

### **Ordinary High Water Mark**

The mark found by examining the bed and banks of a stream and ascertaining where the presence and action of waters are common and long maintained in ordinary years as to mark upon the soil a vegetative character distinct from that of the abutting upland. In any area where the ordinary high water mark cannot be found, the line of mean high water shall substitute. In any area where neither can be found, the top of the channel or lake bank shall substitute. In braided channels and alluvial fans, the ordinary high water mark or line of mean high water shall be measured so as to include the entire stream feature.

### **Qualified Professional**

A person with experience and training in the pertinent scientific discipline, and who is a qualified scientific expert with expertise appropriate for the relevant critical area subject in accordance with WAC 365-195-905. A qualified professional must have obtained a B.S. or B.A. or equivalent degree in biology, engineering, environmental studies, fisheries, geomorphology, or related field, and have at least five years of related work experience.

- (a) A qualified professional for wetlands must be a professional wetland scientist with at least two years of full-time work experience as a wetlands professional, including delineating wetlands using the federal manuals and supplements, preparing wetlands reports, conducting function assessments, and developing and implementing mitigation plans.

- (b) A qualified professional for habitat must have a degree in biology or a related degree and professional experience related to the subject species.
- (c) A qualified professional for a geological hazard must be a professional engineer or geologist, licensed in the state of Washington.
- (d) A qualified professional for critical aquifer recharge areas means a hydrogeologist, geologist, engineer, or other scientist with experience in preparing hydrogeologic assessments.

#### **Re-establishment**

The manipulation of the physical, chemical, or biological characteristics of a site with the goal of returning natural or historic functions to a former wetland. Re-establishment results in rebuilding a former wetland and results in a gain in wetland acres and functions. Activities could include removing fill, plugging ditches, or breaking drain tiles.

#### **Regulated Wetland**

A wetland that meets one or more of the following criteria:

- A. Serves significant biological functions;
- B. Serves significant drainage and sedimentation functions;
- C. Shields other areas from wave action, erosion or storm damage;
- D. Serves as valuable storage area for storm and flood waters;
- E. Is a prime natural recharge area;
- F. Serves significant water purification functions.

Although a site specific wetland may not meet the criteria described above, it will be considered a regulated wetland if it is functionally related to another wetland that meets the criteria. Within the wetlands classification process there are the following classes: Class I, Class II, and Class III (See "Wetland" definition.).

#### **Rehabilitation**

The manipulation of the physical, chemical, or biological characteristics of a site with the goal of repairing natural or historic functions and processes of a degraded wetland. Rehabilitation results in a gain in wetland function but does not result in a gain in wetland acres. Activities could involve breaching a dike to reconnect wetlands to a floodplain or returning tidal influence to a wetland.

#### **Restoration**

Measures taken to restore an altered or damaged natural feature, including:



1. Active steps taken to restore damaged wetlands, streams, protected habitat, or their buffers to the functioning condition that existed prior to an unauthorized alteration; and
2. Actions performed to re-establish structural and functional characteristics of the critical area that have been lost by alteration, past management activities, or catastrophic events.

~~Returning a stream, wetland or other sensitive area or any associated buffer to a state in which its stability and functions approach its unaltered (or original) state as closely as possible~~

### **Retention/Detention Facility**

A type of drainage facility designed either to hold water for a considerable length of time and to release it by evaporation, plant transpiration and/or infiltration into the ground, or to hold runoff via structural controls and then release it to the surface and storm drainage system.

### **Retention/Detention Facility, Regional**

A surface water control structure installed in or adjacent to a drainage facility, stream or wetland of a basin or sub-basin by the City or a project proponent, as required by the City. Such facilities protect downstream properties from predicted significant regional basin flooding or erosion problems.

### **Seismic Hazard Area**

~~(Denoted on critical areas maps.)~~ Those areas in the City subject to severe risk of earthquake damage as a result of soil liquefaction in areas underlain by cohesionless soils of low density and usually in association with a shallow groundwater table or other seismically induced settlement.

### **Sensitive Critical Area**

Any of those areas in the City which are subject to natural hazards or those land features which support unique, fragile or valuable natural resources including fishes, wildlife and other organisms and their habitat, and such resources which carry, hold or purify water in their natural state. Sensitive Critical areas include coal mine hazard areas, erosion hazard areas, flood hazard areas, landslide hazard areas, seismic hazard areas, steep slope hazard areas, streams, volcanic hazard areas, and wetlands and critical aquifer recharge areas.

### **SEPA**

The State Environmental Policy Act (Chapter 43.21C RCW) and the adopted City environmental policies.

### **Shoreline Master Program**

The applicable City and State laws/codes related to the shoreline programs.

### Steep Slope Hazard Areas

Those areas in the City on slopes of forty percent (40%) or greater within a vertical elevation change of at least ~~ten~~ twenty (2010) feet. A slope is delineated by establishing its toe and top, and is measured by averaging the inclination over at least ten (10) feet of vertical relief.

### Stream

A course or route, formed by nature, including those modified by man, generally consisting of a channel with a bed, banks, or sides substantially throughout its length, along which surface waters naturally and normally flow in draining from higher to lower lands. Normal rainfall is rainfall that is at or near the mean of the accumulated annual rainfall record, based upon the water year as recorded at the Seattle-Tacoma International Airport. Pursuant to the ~~sensitive~~ critical areas section, there are the following stream classifications:

- A. Class 1 streams, only including streams inventoried as “Shorelines of the State” under the adopted Shoreline Master Program, pursuant to Chapter 90.58 RCW;
- B. Class 2 streams, only including streams smaller than Class 1 streams which flow year-round during years of normal rainfall or those which are used by salmonids; and
- C. Class 3 streams, only including streams which are intermittent or ephemeral during years of normal rainfall and which are not used by salmonids.

### ~~Stream Functions~~

~~Natural processes performed by streams including functions which are important in facilitating food chain production; providing habitat for nesting, rearing and resting sites for aquatic, terrestrial and avian species; maintaining the availability and quality of water, such as purifying water; acting as recharge and discharge areas for groundwater aquifers; moderating surface and storm water flows and maintaining the free flowing conveyance of water, sediments and other organic matter.~~

### Wetland

Those areas in the City ~~which that~~ are inundated or saturated by ~~ground or surface~~ water or ground water at a frequency and duration sufficient to support, and ~~that~~ under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. ~~According to the 33 CFR 328.3 (1988), w~~Wetlands generally include swamps, marshes, bogs and similar areas. Wetlands do not include those artificial wetlands intentionally created from non-wetland sites including but not limited to, irrigation and drainage ditches, grass-lined swales, canals, detention facilities, wastewater treatment facilities, farm ponds, and landscape amenities, or those wetlands created after July 1, 1990, that were unintentionally created as a result of the construction of a road, street, or highway. Wetlands may include those artificial wetlands intentionally created from non-wetland areas created to mitigate conversion of wetlands. Where the ~~vegetation has been removed or substantially altered, a wetland shall be determined by the presence or evidence of hydric or organic soil, as well as by other documentation;~~

such as aerial photographs of the previous existence of wetland vegetation. When the areas of any wetlands are hydrologically connected to each other, they shall be added together to determine which of the following categories of wetlands apply:

~~A. Class I Wetland. Only includes wetlands assigned the Unique/Outstanding #1 rating in the 1983 King County Wetlands Inventory (or the most recent City inventory) or which meet any of the following criteria:~~

- ~~1. Are wetlands which have present species listed by the Federal or State government as endangered or threatened or outstanding actual habitat for those;~~
- ~~2. Are wetlands which have forty percent (40%) to sixty percent (60%) permanent open water in dispersed patches with two (2) or more classes of vegetation;~~
- ~~3. Are wetlands equal to or greater than ten (10) acres in size and have three (3) or more wetland classes, one of which is open water;~~
- ~~4. Are wetlands which have present plant associations of infrequent occurrence;~~
- ~~5. Sphagnum or peat wetlands; or~~
- ~~6. Forested wetlands equal to or greater than one (1) acre in size;~~

~~B. Class II Wetland. Only includes wetlands assigned the Significant #2 rating in the 1983 King County Wetlands Inventory (or the most recent City inventory) or which meet any of the following criteria:~~

- ~~1. Are wetlands greater than one (1) acre in size; or~~
- ~~2. Are wetlands equal to or less than one (1) acre in size and have three (3) or more wetland classes; or~~
- ~~3. Are forested wetlands less than one (1) acre in size but are larger than two thousand five hundred (2,500) square feet; or~~
- ~~4. Are wetlands which have present heron rookeries or raptor nesting trees.~~

~~C. Class III Wetland. Only includes wetlands assigned the Lesser Concern #3 rating in the 1983 King County Wetlands Inventory (or most recent City inventory) or which are wetlands equal to or less than one (1) acre in size and have two (2) or fewer wetland classes. This does not include drainage ditches used as part of an approved public storm drainage system that may support wetland vegetation or retention/detention systems.~~

### **Wetland Edge**

The line delineating the outer edge of a wetland established in accordance with the approved federal wetland delineation manual and applicable regional supplements, by using the 1987 U.S. Army Corps of Engineers Wetlands Delineation Manual in conjunction with the Washington Regional Guidance on the 1987 Wetland Delineation Manual dated May 23, 1994.

### **Wetland, Forested**

A wetland with at least thirty percent (30%) of the surface area covered which is characterized by woody vegetation greater than at least twenty (20) feet in height that is at least partially rooted within the wetland tall.

### **Wetland Functions**

Natural processes performed by wetlands including functions which are important in facilitating food chain production, providing habitat for nesting, rearing and resting sites for aquatic, terrestrial and avian species, maintaining availability and quality of water, acting as recharge and discharge areas for groundwater aquifers and moderating surface and storm water flows, as well as providing other functions including, but not limited to, those set forth in 33 CFR 320.4(b)(2), 1988.

### **Wetland, Isolated**

A wetland that is outside of and not contiguous to any 100-year flood plain of a lake, river or which has a total size less than two thousand five hundred (2,500) square feet excluding buffers, which is hydrologically isolated from other wetlands or streams, and has no contiguous hydric soil or hydrophytic vegetation between the wetland and any surface which does not have permanent open water, including other wetlands.

### **Wetland Mosaic**

An area with a concentration of multiple small wetlands, in which each patch of wetland is less than one acre; on average, patches are less than 100 feet from each other; and areas delineated as vegetated wetland are more than 50% of the total area of the entire mosaic, including uplands and open water

### **Wetland Mitigation Bank**

A site where wetlands are restored, created, enhanced, or in exceptional circumstances, preserved expressly for the purpose of providing advance mitigation to compensate for future, permitted impacts to similar resources.

### **Wet Meadow, Grazed**

Palustrine emergent wetland typically having up to six (6) inches of standing water during the wet season and dominated under normal conditions by meadow emergents such as reed, canary grass, spike rushes, bulrushes, sedges and other rushes. During the growing season, the soil is often saturated but not covered with water. These meadows frequently have been or are being used for livestock activities.

### **Wet Pond**

An artificial water body constructed as a part of a surface water management system.

### **15.700.020 Appeals**

Any decision to approve, condition or deny a development proposal based on the requirements of Chapter 15.700 ~~Environmentally Sensitive Critical~~ Areas SMC may be appealed according to, and as part of, the appeal procedure for the permit or approval involved.

### **15.700.030 ~~Sensitive Critical~~ Area Rules**

Applicable City departments are authorized to adopt administrative rules and regulations as are necessary and appropriate to implement Chapter 15.700 ~~Environmentally Sensitive Critical~~ Areas SMC, and to prepare and require the use of such forms as are necessary for its administration.

### **15.700.040 Complete Exemptions**

The following are exempt from the provisions of this chapter and any administrative rules promulgated thereunder:

- A. Emergencies which threaten the public health, safety and welfare or which pose an imminent risk of damage to private and public property as long as any alteration undertaken pursuant this subsection is reported to the Department and Department of Public Works immediately, upon which the Director(s) shall either confirm that an emergency exists or determine if further permit review or mitigation is necessary;
- B. Agricultural activities in existence before November 27, 1990 as follows:
  - 1. Mowing of hay, grass or grain crops;
  - 2. Tilling, dicing, planting, seeding, harvesting and related activities for pasture, food crops, grass seed or sod if such activities do not take place on steep slopes; and
  - 3. Normal and routine maintenance of existing irrigation and drainage ditches not used by salmonids;
- C. Permitted building construction, normal and routine landscaping and maintenance not otherwise prohibited by this chapter.
- D. When a property redevelops, if portions of a required buffer width are already developed with legally established uses, those portions of the proposed redevelopment within the required buffer width are exempt from the buffer requirements of this Chapter.

EE. Public water, electric and natural gas distribution, public and private sewer collection, storm water systems to include retention/detention ponds, cable communications, telephone distribution and collection system, and related activities undertaken pursuant to City approved best management practices, as follows:

1. Normal and routine maintenance or repair of existing utility structures or rights-of-way;
2. Relocation of electric facilities, lines, equipment or appurtenances, not including substations, with an associated voltage of fifty-five thousand (55,000) volts or less, only when required by a local governmental agency which approves the new location of facilities;
3. Replacement, operation, repair, modification or installation or construction in an improved city road right-of-way of all electric facilities, lines, equipment or appurtenances, not including substations, with an associated voltage of fifty-five thousand (55,000) volts or less;
4. Relocation or maintenance of sanitary and storm sewer systems, public water local distribution, natural gas, cable communication or telephone distribution and collection facilities, lines, pipes, ditches, mains, equipment or appurtenances, only when required by a local governmental agency which approves the new location of the facilities; and
5. Replacement, operation, repair, modification, installation or construction in an improved City road right-of-way of public local collection, public water distribution, natural gas, cable communication or telephone facilities, lines, pipes, mains, equipment or appurtenances;

EF. Improvements, on-going maintenance, operation, repair or replacement of public roadways and pedestrian improvements in an improved public road right-of-way in existence prior to November 27, 1990 which, at a minimum, is improved with an all-weather driving surface (with any associated shoulders);

EG. Construction and improvements of unimproved public rights-of-way in existence prior to November 27, 1990;

FH. Improvements, on-going maintenance, operation, repair or replacement of public roadways and pedestrian improvements in an improved public road right-of-way constructed after November 27, 1990, in conformance with this chapter which, at a minimum, is improved with an all-weather driving surface (with any associated shoulders);

- GL. Emergent wetlands that have been created directly as the result of poorly maintained public storm drainage systems and would have not been created if the storm drainage system had otherwise been maintained;
- HJ. Public agency development proposals only to the extent of any construction contract awarded before November 27, 1990; provided, that any law or regulation in effect at the time of such award shall apply to the proposal.

#### **15.700.050 Partial Exemptions**

The following are exempt from the provisions of this and any administrative rules promulgated thereunder, except for the notice on title provisions, SMC 15.700.160 Notice of Title, and the flood hazard area provisions, SMC 15.700.200 Flood Hazard Areas - Components through 15.700.240 Flood Hazard Areas – Certification by an Engineer or Surveyor:

- A. Structural modification of, addition to, or replacement of structures, except single-family detached residences, in existence before November 27, 1990, which do not meet the building setback or buffer requirements for wetlands, streams or steep slope hazard areas if the modification, addition, replacement or related activity does not increase the existing footprint of the structure lying within the above-described building setback area, ~~sensitive-critical~~ area or buffer;
- B. Structural modification of, addition to, or replacement of single-family detached residences in existence before November 27, 1990, which do not meet the building setback or buffer requirements for wetland, streams or steep slope hazard areas if the modification, addition, replacement or related activity does not increase the existing footprint of the residence lying within the above-described buffer or building setback area by more than one thousand (1,000) square feet over that existing before November 27, 1990, and no portion of the modification, addition or replacement is located closer to the ~~sensitive-critical~~ area or, if the existing residence is in the ~~sensitive-critical~~ area, extends further in the ~~sensitive-critical~~ area; and
- C. Maintenance or repair of structures which do not meet the development standards of this chapter for landslide and seismic hazard areas if the maintenance or repair does not increase the footprint of the structure, and there is no increased risk to life or property as a result of the proposed maintenance or repair.

#### **15.700.060 Exceptions**

- A. If the application of this chapter would prohibit a development proposal by a public agency or public utility, the agency or utility may apply for an exception pursuant to this subsection:

1. The public agency or utility shall apply to the Department and shall make available to the Department other related project documents such as permit applications to other agencies, special studies and SEPA documents. The Department shall prepare a recommendation to the Hearing Examiner;
2. The Hearing Examiner shall review the application and conduct a public hearing pursuant to the provisions of Chapter 15.115 Land Use Actions and Procedures SMC. The Hearing Examiner shall make a recommendation to the City Council based on the following criteria:
  - a. There is no other practical alternative to the proposed development with less impact on the ~~sensitive-critical~~ area; and
  - b. The proposal minimizes the impact on ~~sensitive-critical~~ areas;
3. This exception shall not allow the use of the following ~~sensitive-critical~~ areas for regional retention/detention facilities except where there is a clear showing that the facility will protect public health and safety or repair damaged natural resources:
  - a. Class 1 streams or buffers;
  - b. Class I wetlands or buffers with plant association of infrequent occurrence; or
  - c. Class I or II wetlands or buffers which provide critical or outstanding habitat for herons, raptors or State or Federal designated endangered or threatened species unless clearly demonstrated by the applicant that there will be no impact on such habitat.
  - d. See subsection 15.700.290(G)(2) for additional criteria

B. If the application of this chapter would deny all reasonable use of the property, the applicant may apply for an exception pursuant to this subsection:

1. The applicant shall apply to the Department who shall prepare a recommendation to the Hearing Examiner. The applicant may apply for a reasonable use exception without first having applied for a variance if the requested exception includes relief from standards for which a variance cannot be granted pursuant to the provisions of this code.
2. The Hearing Examiner shall review the application in consultation with the City Attorney and shall conduct a public hearing pursuant to the provisions of Chapter 15.115 Land Use Actions and Procedures SMC. The Hearing Examiner shall make a final decision based on the following criteria:



- a. The application of this chapter would deny all reasonable use of the property;
  - b. There is no other reasonable use with less impact on the ~~sensitive critical~~ area;
  - c. The proposed development does not pose an unreasonable threat to the public health, safety or welfare on or off the development proposal site and is consistent with the general purposes of this chapter and the public interest; and
  - d. Any alterations permitted to the ~~sensitive critical~~ area shall be the minimum necessary to allow for reasonable use of the property.
3. Any authorized alteration of a ~~sensitive critical~~ area under this subsection shall be subject to conditions established by the Hearing Examiner including, but not limited to, mitigation under an approved mitigation plan.

#### **15.700.070 Critical Area Maps and Inventories**

The distribution of ~~environmentally sensitive critical~~ areas in the City is displayed on maps in the ~~Environment Element of the city's Comprehensive Plan, available Sensitive Areas Map Folio by King County from the Community and Economic Development Department and through the city's website. Many of the wetlands are inventoried and rated, and that information is published in the SeaTac Wetlands Inventory Notebooks. Flood Hazard areas are mapped by the Federal Insurance Administration.~~ If there is a conflict among the maps, inventory and site-specific features, the actual presence or absence of the features defined in this code as ~~sensitive critical~~ areas shall govern.

#### **15.700.080 Disclosure by Applicant**

- A. The applicant shall disclose to the City the presence of ~~sensitive critical~~ areas on the development proposal site.
- B. If the development proposal site contains or is within a ~~sensitive critical~~ area, the applicant shall submit an affidavit which declares whether the applicant has knowledge of any illegal alteration to any or all ~~sensitive critical~~ areas on the development proposal site and whether the applicant previously has been found in violation of this chapter. If the applicant previously has been found in violation, the applicant shall declare whether such violation has been corrected to the satisfaction of the City.

#### **15.700.090 ~~Sensitive Critical~~ Area Review**

- A. The City shall perform a ~~sensitive critical~~ area review for any SeaTac development proposal permit application or other request for permission to

proceed with an alteration on a site which includes a ~~sensitive-critical~~ area or is within an identified ~~sensitive-critical~~ area buffer or building setback area.

B. As part of the ~~sensitive-critical~~ area review, the City shall:

1. Determine whether any ~~sensitive-critical~~ area exists on the property and confirm its nature and type;
2. Determine whether a ~~sensitive-critical~~ area ~~report special study~~ is required;
3. Evaluate the ~~sensitive-critical~~ area ~~report special study~~;
4. Determine whether the development proposal is consistent with this chapter;
5. Determine whether any proposed alteration to the ~~sensitive-critical~~ area is necessary; and
6. Determine if the mitigation and monitoring plans and bonding measures proposed by the applicant are sufficient to protect the public health, safety and welfare, consistent with the goals, purposes, objectives and requirements of this chapter.

#### **15.700.100 ~~Sensitive-Critical Area Report Special Study Requirement~~**

- A. An applicant for a development proposal which includes a ~~sensitive-critical~~ area or is within an identified critical area buffer shall enter into a three (3) party agreement, as approved by the City, whereby the applicant shall pay the costs for the City to hire the appropriate consultant(s) to provide a ~~sensitive-critical~~ area ~~report special study~~ to adequately evaluate the proposal and all probable impacts. The selection of the consultant(s) hired by the City shall be at the sole discretion of the City.
- B. The City may waive the requirement for a ~~critical area report special study~~ if the applicant shows, to the City's satisfaction, that:
1. There will be no alteration of the ~~sensitive-critical~~ area or buffer;
  2. The development proposal will not have an impact on the ~~sensitive-critical~~ area in a manner contrary to the goals, purposes, objectives and requirements of this chapter; and
  3. The minimum standards required by this chapter are met.
- C. If necessary to insure compliance with this chapter, the City may require additional information from the applicant or consultant pursuant to the agreement specified in subsection (A) of this section.

**15.700.110 Contents of Sensitive Critical Area Report~~Special Study~~**

- A. ~~The sensitive-critical area report special study shall be based on the best available science as defined in WAC 365-195-900 through 925, as amended, and shall be conducted by a qualified professional(s).~~
- B. ~~The critical area report shall be in the form of a written report and shall contain the following:~~
1. Identification and characterization of all ~~sensitive-critical~~ areas on or encompassing the development proposal site;
  2. Assessment of the impacts of any alteration proposed for a ~~sensitive critical~~ area or buffer, as applicable, assessment of the impacts of any alteration on the development proposal, other properties and the environment;
  3. Studies which propose adequate mitigation, maintenance, monitoring and contingency plans and bonding measures;
  4. A scale map of the development proposal site; and
  5. Detailed studies, as required by the City.
- ~~CB.~~ A ~~sensitive-critical area report special study~~ may be combined with any studies required by other laws and regulations.

**15.700.120 Mitigation, Maintenance, Monitoring and Contingency**

- A. ~~Before impacting any critical area or its buffer, an applicant shall demonstrate that the following actions have been taken. Actions are listed in the order of preference: As determined by the City, mitigation, maintenance and monitoring measures shall be in place to protect sensitive areas and buffers from alterations occurring on the development proposal site.~~
- ~~A.1. Avoid the impact altogether by not taking a certain action; or parts of an action.~~
- ~~B.2. Minimizing the impact~~ Minimize impacts by limiting the degree or magnitude of the action ~~and its implementation.~~ by using appropriate technology, or by taking affirmative steps to avoid or reduce ~~the impact; impacts.~~
- ~~C.3. Rectifying~~ Rectify the impact by repairing, rehabilitating, or restoring the affected ~~sensitive area or buffer; environment.~~
- ~~D.4. Reducing~~ Reduce or eliminating/eliminate the impact over time by preservation ~~or and~~ maintenance operations ~~during the life of the development proposal;.~~

~~E.5-Compensating \_\_\_\_\_ Compensate for the impact by replacing, enhancing, or providing substitute sensitive areas and resources or environments; and.~~

~~F.6-Monitoring \_\_\_\_\_ Monitor the impact required compensation and taking appropriate remedial or corrective measures, when necessary.~~

~~B. Where monitoring reveals a significant deviation from predicted impacts or a failure of mitigation or maintenance measures, the applicant shall be responsible for appropriate corrective action which, when approved, shall be subject to further monitoring.~~

### **15.700.130 Bonds to Insure Mitigation, Maintenance and Monitoring**

- A. When mitigation required pursuant to a development proposal is not completed prior to the City finally approving the proposal, the City may delay final approval until mitigation is completed or may require the applicant to post a performance bond or other security in a form and amount deemed acceptable by the City. The bond shall be sufficient to guarantee that all required mitigation measures will be completed no later than the time established by the City in accordance with this chapter.
- B. If the development proposal is subject to mitigation, maintenance or monitoring plans, the applicant shall post a maintenance/monitoring bond or other security in a form and amount deemed acceptable by the City. The bond shall be sufficient to guarantee performance of conditions or mitigation measures required by this chapter for a period of up to five (5) years. The duration of maintenance/monitoring obligations shall be established by the City, based upon the nature of the proposed mitigation, maintenance or monitoring and the likelihood and expense of correcting mitigation or maintenance failures.
- C. Performance and maintenance/monitoring bonds or other security shall also be required for restoration of a sensitive-critical area or buffer not performed as part of a mitigation or maintenance plan, except that no bond shall be required for minor stream restoration carried out pursuant to this chapter. The bond or other security shall be in a form and amount deemed acceptable by the City.
- D. Performance and maintenance/monitoring bonds or other security authorized by this section shall remain in effect until the City determines, in writing, that the standards bonded for have been met.
- E. Depletion, failure or collection of bond funds shall not discharge the obligation of an applicant or violator to complete required mitigation, maintenance, monitoring or restoration.
- F. Development proposals made by the City shall be relieved from having to comply with the bonding requirements of this section if public funds have previously been committed for mitigation, maintenance, monitoring or restoration.

**15.700.140 Vegetation Management Plan**

- A. For all development proposals where preservation of existing vegetation is required by this chapter, a vegetation management plan shall be submitted and approved prior to issuance of the permit or other request for permission to proceed with any alteration.
- B. The vegetation management plan shall identify the proposed clearing limits for the project and any areas where vegetation in a ~~sensitive-critical~~ area or its buffer is proposed to be disturbed.
- C. Where clearing includes cutting any merchantable stand of timber, as defined in WAC 222-16-010(28), the vegetation management plan shall include a description of proposed logging practices which demonstrates how all critical areas will be protected in accordance with the provisions of this chapter.
- D. Clearing limits as shown on the plan shall be marked in the field in a prominent and durable manner. Proposed methods of field marking shall be reviewed and approved by the City prior to any site alteration. Field marking shall remain in place until the certificate of occupancy or final project approval is granted.
- E. The vegetation management plan may be incorporated into a temporary erosion and sediment control plan or landscaping plan where either of these plans is required by other laws or regulations.
- F. Submittal requirements for vegetation management plans shall be set forth in the application packet.

**15.700.150 ~~Sensitive-Critical~~ Area Markers and Signs**

- A. Permanent survey stakes delineating the boundary between adjoining properties and ~~sensitive-critical~~ area tracts shall be set, using iron or concrete markers as established by current survey standards.
- B. The boundary between a ~~sensitive-critical~~ area tract and contiguous land shall be identified with permanent signs, printed in two (2) international languages.
- C. In all new developments, short plats, and formal subdivisions, all storm drains shall be stenciled "Dump No Waste, Drains to Stream" prior to the occupancy of any structures within the new development, or prior to the occupancy of any new residence within the short plat or formal subdivision.

**15.700.160 Notice on Title**

- A. The owner of any property containing ~~sensitive-critical~~ areas or buffers on which a development proposal is submitted, except a public right-of-way or the site of a permanent public facility, shall file a covenant approved by the City with the King County Records and Elections Division. The required contents

and form of the notice shall be set forth in administrative rules. The notice shall inform the public of the presence of ~~sensitive-critical~~ areas or buffers on the property, of the application of this chapter to the property, and that limitations on actions in or affecting such ~~sensitive-critical~~ areas or buffers may exist. The covenant shall run with the land.

- B. The applicant shall submit proof that the notice has been filed for public record before the City shall approve any development proposal for the property or, in the case of subdivisions, short subdivisions, and binding site plans, at or before recording.

#### **15.700.170 ~~Sensitive-Critical~~ Area Tracts and Designation on Site Plans**

- A. ~~Sensitive-Critical~~ area tracts shall be used to delineate and protect those ~~sensitive-critical~~ areas and buffers listed below in development proposals for subdivisions, binding site plans and easements for short plats and other developments, and shall be recorded on all documents of title of record for all affected lots:
1. All landslide hazard areas and buffers which are one (1) acre or greater in size;
  2. All steep slopes hazard areas and buffers which are one (1) acre or greater in size;
  3. All wetlands and buffers; and
  4. All streams and buffers.
- B. Any required ~~sensitive-critical~~ area tract shall be held in undivided interest by each owner of a building lot within the development, with this ownership interest passing with the ownership of the lot, or shall be held by an incorporated homeowner's association or other legal entity which assures the ownership, maintenance and protection of the tract.
- C. Site plans submitted as part of development proposals for building permits, master plan developments and clearing and grading permits shall include and delineate all landslide and steep slope hazard areas, streams and wetlands, buffers and building setbacks. The site plans shall be attached to the notice on title required by SMC 15.700.160, Notice on Title.

#### **15.700.180 Building Setbacks**

Unless otherwise provided, buildings and other structures shall be set back a distance of fifteen (15) feet from the edges of all ~~sensitive-critical~~ area buffers or from the edges of all ~~sensitive-critical~~ areas if no buffers are required. The following may be allowed in the building setback area:

- A. Landscaping;
- B. Uncovered decks;
- C. Building overhangs if such overhangs do not extend more than eighteen (18) inches into the setback area; and
- D. Impervious ground surfaces, such as driveways and patios; provided, that such improvements may be subject to special drainage provisions specified in City policies and rules adopted for the various ~~sensitive~~ critical areas.

Critical Area buffer requirements may be found in the Development Standards section for each type of critical area.

~~The following Sensitive Areas Setback Requirements Chart specifies setback buffers and additional building setbacks. The setback buffers specified are minimum requirements, and may be increased based on special studies completed by qualified professionals pursuant to SMC 15.700.290, Wetlands Permitted Alterations.~~

	SETBACK BUFFER	BUILDING SETBACK FROM BUFFER
Class I Wetland	100 feet	15 feet
Class II Wetland	50 feet	15 feet
Class III Wetland	35 feet	15 feet
Class 1 Stream	100 feet	15 feet
Class 2 Stream with Salmonids	100 feet	15 feet
Class 2 Stream	50 feet	15 feet
Class 3 Stream	25 feet	15 feet
Slopes 40% or greater	50 feet from top, toe, or side of slope	N/A
Landslide Hazard Areas	50 feet from all edges of the landslide hazard area	N/A

### **15.700.190 Erosion Hazard Areas – Development Standards and Permitted Alterations**

- A. Clearing on an erosion hazard area is allowed only from April 1st to September 1st, except that:
  - 1. Up to fifteen thousand (15,000) square feet may be cleared on any lot, subject to any other requirement for vegetation retention and subject to any clearing and grading permit required by Chapter 15.445 Landscaping and Tree Retention SMC; and

2. Timber harvest may be allowed pursuant to an approved forest practice permit issued by the Washington Department of Natural Resources or a clearing and grading permit issued by the City.
- B. All development proposals on sites containing erosion hazard areas shall include a temporary erosion control plan consistent with this section and other laws and regulations prior to receiving approval.
- C. All subdivisions, short subdivisions or binding site plans on sites with erosion hazard areas shall comply with the following additional requirements:
1. Except as provided in this section, existing vegetation shall be retained on all lots until building permits are approved for development on individual lots;
  2. If any vegetation on the lots is damaged or removed during construction of the subdivision infrastructure, the applicant shall be required to submit a restoration plan to the City for review and approval. Following approval, the applicant shall be required to implement the plan;
  3. Clearing of vegetation on lots may be allowed without a separate clearing and grading permit if the City determines that:
    - a. Such clearing is a necessary part of a large scale grading plan;
    - b. It is not feasible to perform such grading on an individual lot basis; and
    - c. Drainage from the graded area will meet water current quality standards ~~to be established by administrative rules.~~
- D. Where the City determines that erosion or water quality from a development site poses a significant risk of damage to downstream receiving waters, based either on the size or characteristics of the project or proposed use, ~~the potential of molecular water runoff from the highest, most vertical steel or wooden surface of a structure, more commonly known as a roof, to the roof of an alloy/enamel covered motorized automobile to an impervious surface (including, but not limited to, paved and gravel parking lots) inter-mixed with petroleum by-products,~~ the proximity to the receiving water or the sensitivity of the receiving water or the fishes, the applicant shall be required to provide regular monitoring of surface water discharge from the site. If the project does not meet current water quality standards, ~~established by law or administrative rules,~~ the City may suspend further development work on the site until such standards are met.



- E. The use of hazardous substances, pesticides and fertilizers in erosion hazard areas may be prohibited by the City under the applicable RCW statutes.

**15.700.200 Flood Hazard Areas – Components**

- A. A flood hazard area consists of the following components:
  - 1. Floodplain;
  - 2. Flood fringe;
  - 3. Zero-rise floodway; and
  - 4. Federal Emergency Management Agency (FEMA) floodway.
- B. The City shall determine the flood hazard area after obtaining, reviewing and utilizing base flood elevations and available floodway data for a flood having a one (1) percent chance of being equaled or exceeded in any given year, often referred to as the “one hundred (100) year flood.” The base flood is determined for existing conditions unless a basin plan including projected flows under future developed conditions has been completed, approved and adopted by the City, in which case these future flow projections shall be used. In areas where the flood insurance study for the City includes detailed base flood calculations, those calculations may be used until projection of future flows are completed and approved by the City in concurrence with FEMA.

**15.700.210 Flood Fringe – Development Standards and Permitted Alterations**

- A. Development proposals shall not reduce the effective base flood storage volume of the floodplain. Grading or other activity which would reduce the effective storage volume shall be mitigated by creating compensatory storage on the site or off the site if legal arrangements can be made to ensure that the effective compensatory storage volume will be preserved over time.
- B. No structure shall be allowed which would be at risk due to stream bank destabilization including, but not limited to, that associated with channel relocation or meandering.
- C. All elevated construction shall be designed and certified by a professional structural engineer licensed by the State of Washington and shall be reviewed by the City prior to construction.
- D. Subdivisions, short subdivisions and binding site plans shall meet the following requirements:
  - 1. New building lots shall contain five thousand (5,000) square feet or more of buildable land outside the zero-rise floodway, and building setback

areas shall be shown on the face of the plat to restrict permanent structures to this buildable area;

2. All utilities and facilities such as sewer, gas, electrical, and water systems shall be located and constructed consistent with subsections (E), (F), (H) and (I) of this section;
3. Base flood data and flood hazard notes shall be shown on the face of the recorded subdivision, short subdivision or binding site plan including, but not limited to, the base flood elevation, required flood protection elevations and the boundaries of the floodplain and the zero-rise floodway, if determined; and
4. The following notice shall also be shown on the face of the recorded subdivision, short subdivision, or binding site plan for all affected lots:

NOTICE

Lots and structures located within flood hazard areas may be inaccessible by emergency vehicles during flood events. Residents and property owners should take appropriate advance precaution.

- E. New residential structures and substantial improvements of existing residential structures shall meet the following requirements:
  1. The lowest floor shall be elevated above the official floodplain elevation;
  2. Portions of a structure which are below the lowest floor area shall not be fully enclosed. The areas and rooms below the lowest floor shall be designed to automatically equalize hydrostatic and hydrodynamic flood forces on exterior walls by allowing for the entry and exit of floodwaters. Designs for satisfying this requirement shall meet or exceed the following requirements:
    - a. A minimum of two (2) openings on opposite walls having a total open area of not less than one (1) square inch for every square foot of enclosed area subject to flooding shall be provided;
    - b. The bottom of all openings shall be no higher than one (1) foot above grade; and
    - c. Openings may be equipped with screens, louvers or other coverings or devices if they permit the unrestricted entry and exit of floodwaters;

3. Materials and methods which are resistant to, and minimize, flood damage shall be used; and
  4. All electrical, heating, ventilation, plumbing, air conditioning equipment and other utility and service facilities shall be floodproofed to or elevated above the flood protection elevation.
- F. New nonresidential structures and substantial improvements of existing nonresidential structures shall meet the following requirements:
1. The elevation requirement for residential structures contained in subsection (E)(1) shall be met; or
  2. The structure shall be floodproofed to the flood protection elevation and shall meet the following requirements:
    - a. The applicant shall provide certification by a professional civil or structural engineer licensed by the State of Washington that the floodproofing methods are adequate to withstand the flood depths, pressures, velocities, impacts, uplift forces and other factors associated with the base flood. After construction, the engineer shall certify that the permitted work conforms with the approved plans and specifications; and
    - b. Approved building permits for floodproofed, nonresidential structures shall contain a statement notifying the applicant that flood insurance premiums shall be based upon rates for structures which are one (1) foot below the floodproofed level;
  3. Materials and methods which are resistant to and minimize flood damage shall be used; and
  4. All electrical, heating, ventilation, plumbing, air-conditioning equipment and other utility and service facilities shall be floodproofed to or elevated above the flood protection elevation.
- G. Mobile homes and mobile home parks shall meet the following requirements:
1. Mobile homes shall meet all requirements for flood hazard protection for residential structures and shall be anchored and installed using Building Code methods and practices which minimize flood damage; and
  2. No permit or approval for the following shall be granted unless mobile homes within the mobile home park meet the requirements for flood hazard protection for residential structures:

- a. A new mobile home park;
  - b. An expansion of an existing mobile home park; or
  - c. Annual repair or reconstruction of streets, utilities or pads in an existing mobile home park which equals or exceeds fifty percent (50%) of the value of such streets, utilities or pads.
- H. Utilities shall meet the following requirements:
- 1. New and replacement utilities including, but not limited to, sewage treatment facilities shall be floodproofed to or elevated above the flood protection elevations;
  - 2. New, on-site sewage disposal systems shall be, to the extent possible, located outside the limits of the base flood elevation. The installation of new, on-site sewage disposal systems in the flood fringe may be allowed if no feasible alternative site is available;
  - 3. Sewage and agricultural waste storage facilities shall be floodproofed to the flood protection elevation;
  - 4. Above-ground utility transmission lines, other than electric transmission lines, shall only be allowed for the transport of nonhazardous substances; and
  - 5. Buried utility transmission lines transporting hazardous substances shall be buried at a minimum depth of four (4) feet below the maximum depth of scour for the base flood, as determined by a professional civil engineer licensed by the State of Washington, and shall achieve sufficient negative buoyancy so that any potential for flotation or upward migration is eliminated.
- I. Critical facilities may be allowed within the flood fringe of the floodplain, but only when no feasible alternative site is available. Critical facilities shall be evaluated through the major conditional use permit process. Critical facilities constructed within the flood fringe shall have the lowest floor elevated to three (3) or more feet above the base flood elevation. Floodproofing and sealing measures shall be taken to ensure that hazardous substances will not be displaced by or released into the floodwaters. Access routes elevated to or above the base flood elevation shall be provided to all critical facilities from the nearest maintained public street or roadway.
- J. Prior to approving any permit for alterations in the flood fringe, the City shall determine that all permits required by State or Federal law have been obtained.

**15.700.220 Zero-Rise Floodway – Development Standards and Permitted Alterations**

- A. The requirements which apply to the flood fringe shall also apply to the zero-rise floodway. The more restrictive requirements shall apply where there is a conflict.
- B. A development proposal including, but not limited to, new or reconstructed structures shall not cause any increase in the base flood elevation unless the following requirements are met:
  - 1. Amendments to the Flood Insurance Rate Map are adopted by FEMA, in accordance with 44 CFR 70, to incorporate the increase in the base flood elevation; and
  - 2. Appropriate legal documents are prepared in which all property owners affected by the increased flood elevations consent to the impacts on their property. These documents shall be filed with the title of record for the affected properties.
- C. The following are presumed to produce no increase in base flood elevation and shall not require a special study to establish this fact:
  - 1. New residential structures outside the FEMA floodway on lots in existence before November 27, 1990, which contain less than five thousand (5,000) square feet of buildable land outside the zero-rise floodway and which have a total building footprint of all proposed structures on the lot of less than two thousand (2,000) square feet;
  - 2. Substantial improvements of existing residential structures in the zero-rise floodway, but outside the FEMA floodway, where the footprint is not increased; or
  - 3. Substantial improvements of existing residential structures meeting the requirements for new residential structures in SMC 15.700.220.
- D. Post or piling construction techniques which permit water flow beneath a structure shall be used.
- E. All temporary structures or substances hazardous to public health, safety and welfare, except for hazardous household substances or consumer products containing hazardous substances, shall be removed from the zero-rise floodway during the flood season from September 30th to May 1st.
- F. New residential or nonresidential structures shall meet the following requirements:

1. The structures shall be outside the FEMA floodway; and
  2. The structures shall be on lots in existence before November 27, 1990, which contain less than five thousand (5,000) square feet of buildable land outside the zero-rise floodway.
- G. Utilities may be allowed within the zero-rise floodway if the City determines that no feasible alternative site is available, subject to the following requirements:
1. Installation of new on-site sewage disposal systems shall be prohibited unless a waiver is granted by the Seattle/King County Department of Public Health; and
  2. Construction of sewage treatment facilities shall be prohibited.
- H. Critical facilities shall not be allowed within the zero-rise floodway.
- I. Structures and installations which are dependent upon the floodway may be located in the floodway if the development proposal is approved by all agencies with jurisdiction. Such structures include, but are not limited to:
1. Dams or diversions for water supply, flood control, irrigation or fisheries enhancement;
  2. Flood damage reduction facilities, such as levees and pumping stations;
  3. Stream bank stabilization structures where no feasible alternative exists for protecting public or private property;
  4. Storm water conveyance facilities subject to the development standards for streams and wetlands and the Surface Water Design Manual;
  5. Recreation structures;
  6. Bridge piers and abutments; and
  7. Other fisheries enhancement or stream restoration projects.

**15.700.230 FEMA Floodway – Development Standards and Permitted Alterations**

- A. The requirements which apply to the zero-rise floodway shall also apply to the FEMA floodway. The more restrictive requirements shall apply where there is a conflict.

- B. A development proposal including, but not limited to, new or reconstructed structures shall not cause any increase in the base flood elevation.
- C. New residential or nonresidential structures are prohibited within the FEMA floodway.
- D. Substantial improvements of existing residential structures in the FEMA floodway meeting the requirements of WAC 173-158-070, as amended, are presumed to produce no increase in base flood elevation and shall not require a special study to establish this fact.

**15.700.240 Flood Hazard Areas – Certification by an Engineer or Surveyor**

- A. For all new structures or substantial improvements in a flood hazard area, the applicant shall provide certification by a professional civil engineer or land surveyor licensed by the State of Washington of:
  - 1. The actual, as-built elevation of the lowest floor, including basement; and
  - 2. The actual, as-built elevation to which the structure is floodproofed, if applicable.
- B. The engineer or surveyor shall indicate if the structure has a basement.
- C. The City shall maintain the certifications required by this section for public inspection.

**15.700.250 Landslide Hazard Areas – Development Standards and Permitted Alterations**

A development proposal on a site containing a landslide hazard area shall meet the following requirements:

- A. A minimum buffer of fifty (50) feet shall be established from all edges of the landslide hazard area. The buffer shall be extended as required to mitigate a steep slope or erosion hazard or as otherwise necessary to protect the public health, safety and welfare;
- B. Unless otherwise provided herein, or as part of an approved alteration, removal of any vegetation from a landslide hazard area or buffer shall be prohibited, except for limited removal of vegetation necessary for surveying purposes and for the removal of hazard trees determined to be unsafe according to tree selection rules promulgated pursuant to this chapter. Notice to the City shall be provided prior to any vegetation removal permitted by this subsection;
- C. Vegetation on slopes within a landslide hazard area or buffer which has been damaged by human activity or infested by noxious weeds may be replaced with

vegetation native to the City pursuant to an enhancement plan approved by the City. The use of hazardous substances, pesticides and fertilizers in landslide hazard areas and their buffers may be prohibited by the City under the applicable RCW statutes; and

- D. Alterations to landslide hazard areas and buffers may be allowed only as follows:
1. A landslide hazard area located on a slope of forty percent (40%) or steeper may be altered only if the alteration meets the standards and limitations set forth for steep slope hazard areas in SMC 15.700.270, Steep Slope Hazard Areas – Development Standards and Permitted Alterations;
  2. A landslide hazard area located on a slope less than forty percent (40%) may be altered only if the alteration meets the following requirements:
    - a. The development proposal will not decrease slope stability on contiguous properties; and
    - b. The landslide hazard area is modified or the development proposal is designed so that the landslide hazard to the project and contiguous property is limited or mitigated, and the development proposal on the site is determined to be safe by the City based on a study prepared by a geologist or geotechnical engineer; and
  3. Neither buffers nor a ~~sensitive~~-critical area tract shall be required if the alterations meet the standards of subsection (D)(2) of this section.

#### **15.700.260 Seismic Hazard Areas – Development Standards and Permitted Alterations**

A development proposal on a site containing a seismic hazard area shall meet the following requirements:

- A. Unless exempt, development proposals shall be subject to review standards based on two (2) occupancy types: critical facilities and other structures. The review standards for critical facilities shall be based on larger earthquake reoccurrence intervals. The review standards for both occupancy types shall be set forth in administrative rules;
- B. Alterations to seismic hazard areas may be allowed only as follows:
  1. The evaluation of site-specific subsurface conditions shows that the proposed development site is not located in a seismic hazard area; or
  2. Mitigation is implemented which renders the proposed development as safe as if it were not located in a seismic hazard area; and



C. The following are exempt from the provisions of this section:

1. Mobile homes; and
2. Single story, nonresidential structures which are less than two thousand five hundred (2,500) square feet and are not used as places of employment or public assembly.

#### **15.700.270 Steep Slope Hazard Areas – Development Standards and Permitted Alterations**

A development proposal on a site containing a steep slope hazard area shall meet the following requirements:

- A. A minimum buffer of fifty (50) feet shall be established from the top, toe and along all sides of any slope forty percent (40%) or steeper. The buffer shall be extended as required to mitigate a landslide or erosion hazard or as otherwise necessary to protect the public health, safety and welfare. The buffer may be reduced to a minimum of ten (10) feet if, based on a Critical Area Report, ~~special study~~ the City determines that the reduction will adequately protect the proposed development and the ~~sensitive~~ critical area. For single-family residential building permits only, the City may waive the special study requirement and authorize buffer reductions if the City determines that the reduction will adequately protect the proposed development and the ~~sensitive~~ critical area;
- B. Unless otherwise provided herein or as part of an approved alteration, removal of any vegetation from a steep slope hazard area or buffer shall be prohibited, except for limited removal of vegetation necessary for surveying purposes and for the removal of hazard trees determined to be unsafe according to tree selection rules promulgated pursuant to this chapter. Notice to the City shall be provided prior to any vegetation removal permitted by this subsection;
- C. Vegetation on steep slopes within steep slope hazard areas or their buffers which has been damaged by human activity or infested by noxious weeds may be replaced with vegetation native to the region pursuant to a vegetation management plan approved by the City. The use of hazardous substances, pesticides and fertilizers in steep slope hazard areas and their buffers may be prohibited by the City;
- D. Alterations to steep slope hazard areas and buffers may be allowed only as follows:
  1. Approved surface water conveyances, as specified in the Surface Water Design Manual, may be allowed on steep slopes if they are installed in a manner to minimize disturbance to the slope and vegetation;

2. Public and private trails may be allowed on steep slopes if they receive site-specific approval by the City, as guided by the construction and maintenance standards in the U.S. Forest Service "Trails Management Handbook," FSH 2309.18, June 1987, as amended, and the "Standard Specifications for Construction of Trails" (EM-7720-102, June 1984, as amended). Under no circumstances shall trails be constructed of concrete, asphalt or other impervious surfaces which will contribute to surface water run-off, unless such construction is necessary for soil stabilization or soil erosion prevention or unless the trail system is specifically designed and intended to be accessible to handicapped person(s);
  3. Utility corridors may be allowed on steep slopes if a special study shows that such alterations will not subject the area to the risk of landslide or erosion;
  4. Limited trimming and pruning of vegetation may be allowed on steep slopes pursuant to an approved vegetation management plan for the creation and maintenance of views if the soils are not disturbed and the activity is subject to administrative rules; and
  5. Approved mining and quarrying activities may be allowed; and
- E. The following are exempt from the provisions of this section:
1. Slopes which are forty percent (40%) or steeper with a vertical elevation change of up to twenty (20) feet if no adverse impact will result from the exemption based on the City's review of and concurrence with a soils report prepared by a geologist or geotechnical engineer; and
  2. The approved regrading of any slope which was created through previous legal grading activities. Any slope which remains forty percent (40%) or steeper following site development shall be subject to all requirements for steep slopes.

#### **15.700.275 Wetlands – Identification and Rating**

- A. Identification of wetlands and delineation of their boundaries pursuant to this Chapter shall be done in accordance with the approved federal wetland delineation manual and applicable regional supplements. All areas within the city meeting the wetland designation criteria in that procedure are hereby designated critical areas and are subject to the provisions of this Chapter. Wetland delineations are valid for five years; after such date the City shall determine whether a revision or additional assessment is necessary.
- B. Wetlands shall be rated according to the Washington Department of Ecology wetland rating system, as set forth in the *Washington State Wetland Rating*

System for Western Washington (Ecology Publication #04-06-025, or as revised and approved by Ecology), which contains the definitions, methods and criteria for determining a wetland's categorization as Category I, II, III or IV.

C. Wetland rating categories shall not change due to illegal modifications.

### **15.700.280320 Wetlands – Limited Exemption**

The following ~~Isolated wetlands less than one thousand (1,000) square feet may be exempted from the requirement provisions of to avoid impacts (SMC 15.700.120.A.1) 15.30.290 through 15.30.320 and may be filled altered by filling or dredging if the City determines that the cumulative impacts do not unduly counteract the purposes of this chapter and are fully mitigated based on the actions in SMC 15.700.120.A.2 through 6.mitigated pursuant to an approved mitigation plan.~~

A. All isolated Category III and IV wetlands less than 1,000 square feet that:

1. Are not associated with riparian areas or buffers
2. Are not part of a wetland mosaic
3. Do not contain habitat identified as essential for local populations of priority species identified by the Washington Department of Fish and Wildlife.

### **15.700.285-280 Wetlands – Buffer RequirementsDevelopment Standards**

A development proposal on a site containing a wetland shall meet the following requirements:

A. ~~The following minimum buffers shall be established from the wetland edge:~~

- ~~1. A Class I wetland shall have a one hundred (100) foot buffer;~~
- ~~2. A Class II wetland shall have fifty (50) foot buffer;~~
- ~~3. A Class III wetland shall have thirty-five (35) foot buffer;~~
- ~~4. Any wetland restored, relocated, replaced or enhanced because of a wetland alteration shall have the minimum buffer required for the wetland class involved; and~~
- ~~5. Any wetland within twenty-five (25) feet of the toe of a slope thirty percent (30%) or steeper, but less than forty percent (40%); shall have:~~
  - ~~a. The minimum buffer required for the wetland class involved or a twenty-five (25) foot buffer beyond the top of the slope, whichever is greater, if the horizontal length of the slope including small benches and terraces is within the buffer for that wetland class; or~~

~~b. A twenty five (25) foot buffer beyond the minimum buffer required for the wetland class involved if the horizontal length of the slope including small benches and terraces extends beyond the buffer for that wetland class;~~

A. **Buffers Required.** A buffer shall be established adjacent to designated wetland areas. The purpose of the buffer area shall be to protect the integrity, functions and values of the wetland area. Buffer widths shall be appropriate for the sensitivity of the wetland and for the risks associated with land use development.

B. **Standard Buffers Comply With BAS.** The following standard buffers have been established in accordance with the best available science (codified at WAC 365-195-900 through 925). They are based on the category of wetland and the habitat score as determined by a qualified wetland professional.

#### Standard Wetland Buffers

The following table specifies standard buffers, which may be modified pursuant to subsections E through H of this section

<u>Wetland Category</u>	<u>Habitat Score</u>			
	<u>3 - 4</u>	<u>5</u>	<u>6 - 7</u>	<u>8 - 9</u>
	<u>Buffer Width in Feet</u>			
<u>Category I</u>	<u>75</u>	<u>105</u>	<u>165</u>	<u>225</u>
<u>Category II</u>	<u>75</u>	<u>105</u>	<u>165</u>	<u>225</u>
<u>Category III</u>	<u>60</u>	<u>105</u>	<u>165</u>	<u>225</u>
<u>Category IV</u>	<u>40</u>			

C. **Impact Minimization Measures Required.** The use of the standard buffer widths requires the implementation of the measures in the following table, where applicable, to minimize the impacts of the adjacent land uses. Examples of Activities That Cause Disturbances include but are not limited to those listed. If an applicant chooses not to apply those measures, then a 33% increase in the width of all buffers is required. For example, a 75-foot buffer with the measures implemented would increase to a 100-foot buffer without them.

**Wetland Impact Minimization Measures**

<u>Disturbance</u>	<u>Examples of Activities and Uses That Cause Disturbances</u>	<u>Required Measures to Minimize Impacts</u>
<u>Lights</u>	<ul style="list-style-type: none"> <li>• <u>Parking lots</u></li> <li>• <u>Warehouses</u></li> <li>• <u>Industrial</u></li> <li>• <u>Multi-family residential</u></li> </ul>	<ul style="list-style-type: none"> <li>• <u>Direct lights away from wetland</u></li> </ul>
<u>Noise in excess of limitations as set forth in SMC 15.460.020</u>	<ul style="list-style-type: none"> <li>• <u>Industrial</u></li> <li>• <u>Parking lots</u></li> <li>• <u>Multi-family residential</u></li> </ul>	<ul style="list-style-type: none"> <li>• <u>Locate activity that generates noise away from wetland</u></li> </ul>
<u>Toxic Runoff</u>	<ul style="list-style-type: none"> <li>• <u>Parking lots</u></li> <li>• <u>Roads</u></li> <li>• <u>Industrial</u></li> <li>• <u>Residential</u></li> <li>• <u>Pesticide application</u></li> <li>• <u>Landscaping</u></li> </ul>	<ul style="list-style-type: none"> <li>• <u>Route all new, untreated runoff away from wetland while ensuring wetland is not dewatered</u></li> <li>• <u>Establish covenants limiting use of pesticides within 150 ft of wetland</u></li> <li>• <u>Apply integrated pest management*</u></li> </ul>
<u>Stormwater Runoff</u>	<ul style="list-style-type: none"> <li>• <u>Roads</u></li> <li>• <u>Driveways</u></li> <li>• <u>Parking Lots</u></li> </ul>	<ul style="list-style-type: none"> <li>• <u>Retrofit stormwater detention and treatment for roads and existing adjacent development</u></li> <li>• <u>Prevent channelized flow from lawns that directly enters the buffer</u></li> <li>• <u>Use LID BMPs</u></li> </ul>
<u>Changes in water regime</u>	<ul style="list-style-type: none"> <li>• <u>Impervious Surfaces</u></li> <li>• <u>Lawns</u></li> <li>• <u>Tilling</u></li> </ul>	<ul style="list-style-type: none"> <li>• <u>Infiltrate or treat, detain, and disperse into buffer new runoff from impervious surfaces and new lawns</u></li> </ul>
<u>Pets and human disturbance</u>	<ul style="list-style-type: none"> <li>• <u>Single family residential</u></li> <li>• <u>Multifamily residential</u></li> <li>• <u>Leash free dog park</u></li> </ul>	<ul style="list-style-type: none"> <li>• <u>Use privacy fencing OR plant dense vegetation to delineate buffer edge and to discourage disturbance using vegetation appropriate for the regional ecology</u></li> <li>• <u>Place wetland and its buffer in a separate tract or protect with a conservation easement</u></li> </ul>
<u>Dust</u>	<ul style="list-style-type: none"> <li>• <u>Excavation</u></li> <li>• <u>Construction</u></li> </ul>	<ul style="list-style-type: none"> <li>• <u>Use best management practices to control dust</u></li> </ul>

\* Integrated pest management is defined as the careful consideration of all available pest control techniques and subsequent integration of appropriate measures that discourage the development of pest populations and keep pesticides and other

interventions to levels that reduce or minimize risks to human health and the environment.

**D. Vegetated Buffer Assumption.** The buffer widths assume that the buffer is vegetated with a native plant community appropriate for the regional ecology. If the existing buffer is sparsely vegetated, or vegetated with invasive species that do not perform needed functions, the buffer shall either be planted to create the appropriate plant community or widened to ensure that functions and values of the buffer are adequately provided.

~~C.E.~~ **Increased Buffers.** Increased buffer widths ~~may shall be required by the City~~ when necessary to protect wetlands. Provisions for additional buffer widths shall be contained in administrative rules promulgated pursuant to this chapter including, but not limited to, provisions pertaining to critical drainage areas, the location of hazardous substances, critical fish and wildlife habitats, landslide or erosion hazard areas contiguous to wetlands, groundwater recharge and discharge areas, and the location of trail or utility corridors, ~~and or when:~~

1. The buffer is within twenty-five (25) feet of the top or toe of a slope that is greater than thirty percent (30%); or
2. The slope is susceptible to erosion and standard best management practices (BMPs) and erosion-control measures will not prevent adverse impacts to the wetland.

~~B.F.~~ **Buffer Width Averaging.** Buffer width averaging may be allowed by the City in accordance with an approved Critical Area Special Study provided that all of the following criteria are met:

1. ~~if it~~ will not reduce provide additional protection to wetlands or enhance their functions;
2. ~~as long as~~ The total area contained in the buffer after averaging on the development proposal site does not decrease;
3. The buffer at its narrowest point is not less than 75 percent of the standard width; and
4. The Critical Area Special Study shall describe the current functions and values of the wetland and its buffer, and the measures that will be taken to ensure that there is no loss of wetland function due to averaging.

**G. Reduced Buffer Allowance.** Reduced buffers may be allowed, with enhancements, in accordance with an approved Critical Area Report provided:

1. The existing condition of the buffer is degraded, or
2. The existing required buffer width, or portions of it have been impacted by development,
  - a. When a redevelopment proposal meets the threshold of “Major Redevelopment” (SMC 15.105.130), only the portions of the site being

altered shall be required to integrate the buffer requirements of this chapter into the design of the proposal.

3. And, additional protection to the wetland is provided through the implementation of a buffer enhancement plan.

4. Buffer enhancement may include, but is not limited to:

- a. Planting native vegetation that would increase value for fish and wildlife habitat, improve water quality, or provide aesthetic or recreational value;
- b. Enhancement of wildlife habitat by incorporating structures that are likely to be used by wildlife, including wood duck boxes, bat boxes, nesting platforms, snags, rootwads, stumps, birdhouses, and nesting areas;
- c. Removing non-native plant species and noxious weeds from the buffer area and replanting the area subject to 4.a. above.

**H. Buffer Reductions Limited.** Buffer reductions under this Section shall be limited to twenty-five percent (25%) of the standard buffer width.

**4.I. Buffers on Mitigation Sites.** All mitigation sites ~~Any wetland restored, relocated, replaced, or enhanced because of a wetland alteration~~ shall have the minimum buffers consistent with the buffer requirements of this Chapter. Buffers shall be based on ~~for the target or expected category of the wetland category involved;~~ and

**J. Determination by Wetland Professional.** Alterations to buffer width requirements pursuant to this section shall be determined by a qualified wetland professional using established methodologies and approved federal and state manuals.

**~~D, K~~ Hazardous Substances Prohibited.** The use of hazardous substances, pesticides, herbicides and fertilizers in the ~~a wetland and or its buffer~~ may be ~~are~~ prohibited except as provided in SMC 15.700.290(D) ~~by the City.~~

### **15.700.290 Wetlands – Permitted Alterations**

Alterations to wetlands and buffers may be allowed only as follows:

- A. If the City determines, based upon its review of a Critical Area Report completed by qualified professionals, that:
  - 1. The wetland does not serve any of the ~~valuable functions and values~~ of wetlands identified in this chapter including, but not limited to, biologic and hydrologic functions; or
  - 2. The proposed development will protect or enhance the wildlife habitat, natural drainage or other ~~valuable functions and values~~ of the wetland and will be consistent with the purposes of this chapter;

To establish the conditions in subsection (A), detailed studies may be required as part of the Critical Area Report on habitat value, functions, hydrology, erosion, and/or water quality. Such detailed studies shall include at a minimum:

- a. Specific recommendations for mitigation;
- b. Existing and proposed wetland acreage;
- c. Vegetative, faunal and hydrologic conditions;
- d. Relationship within watershed and to existing waterbodies;
- e. Soil and substrate conditions, topographic elevations;
- f. Existing and proposed adjacent site conditions;
- g. Required wetland buffers;
- h. Property ownership; and
- i. A discussion of ongoing management practices to monitor and maintain wetland functions and habitat value.

The requirements in subsection (A)(2) of this section may be modified upon written approval of the Director, if the applicant demonstrates that the requirements of this section are met or are otherwise unnecessary.

- B. If a wetland is in a flood hazard area, the applicant shall notify affected communities and native tribes of proposed alterations prior to any alteration and submit evidence of such notification to the Federal Insurance Administration;
- C. There shall be no introduction of any plant or wildlife which is not indigenous to the City or King County into any wetland or buffer unless authorized by a State or Federal permit or approval;
- D. Pursuant to an approved Critical Area Report, maintenance to remove hazards (e.g., flooding of areas outside the buffer) or to remove invasive plant species may be allowed. The use of herbicides may be allowed only if used employing best management practices.
- E. The harvesting of wild crops (e.g., native berries) in a manner that is not injurious to natural reproduction of such crops and provided the harvesting does not require tilling of soil, planting of crops, or changing existing topography, water conditions or water sources.



FD. Utilities may be allowed in wetland buffers if:

1. The City determines that no practical alternative location is available; and
2. The utility corridor meets any additional requirements set forth in administrative rules including, but not limited to, requirements for installation, replacement of vegetation and maintenance;

GE. Sanitary and storm sewer utility corridors may be allowed in wetland buffers only if:

1. The applicant demonstrates that sewer lines are necessary for gravity flow;
2. The corridor is not located in a wetland or buffer used by species listed as endangered or threatened by the State or Federal government or contain critical or outstanding actual habitat for those species or heron rookeries or raptor nesting trees;
3. The corridor alignment including, but not limited to, any allowed maintenance roads follows a path beyond a distance equal to seventy-five percent (75%) of the buffer width from the wetland edge;
4. Corridor construction and maintenance protects the wetland and buffer and is aligned to avoid cutting trees greater than eight (8) inches in diameter as measured four (4) feet above ground level, when possible, and pesticides, herbicides, and hazardous substances are not used;
5. An additional, contiguous and undisturbed buffer, equal in width to the proposed corridor including any allowed maintenance roads, is provided to protect the wetland;
6. The corridor is revegetated with appropriate vegetation native to the City and King County at preconstruction densities or greater immediately upon completion of construction or as soon thereafter as possible, and the sewer utility ensures that such vegetation survives;
7. Any additional corridor access for maintenance is provided, to the extent possible, at specific points rather than by a parallel road; and
8. The width of any necessary parallel road providing access for maintenance is as small as possible, but not greater than fifteen (15) feet; the road is maintained without the use of herbicides, pesticides or other hazardous substances; and the location of the road is contiguous to the utility corridor on the side away from the wetland;

HF. Joint use of an approved sewer utility corridor by other utilities may be allowed;

IG. The following surface water management activities and facilities may be allowed in wetland buffers only as follows:

1. Surface water discharge to a Class I or II wetland from a detention facility, presettlement pond or other surface water management activity or facility may be allowed if the discharge does not increase the rate of flow, change the plant composition in a forested wetland or decrease the water quality of the wetland;
2. A Class I or II wetland or buffer may be used for a regional retention/detention facility if:
  - a. A public agency and utility exception is granted pursuant to SMC 15.700.060, Exceptions;
  - b. Constructed in accordance with the requirements of the Surface Water Design Manual;
  - c. The use will not alter the rating or the factors used in rating the wetland;
  - d. The proposal is in compliance with the latest adopted findings of the Puget Sound Wetlands Research Project; and
  - e. There are no significant adverse impacts to the wetland;
3. A Class III wetland or buffer which has as its major function the storage of water may be used, expanded or reconstructed as a regional retention/detention facility if requirements of the Surface Water Design Manual are met; and
4. Use of a wetland buffer for a surface water management activity or facility, other than a retention/detention facility, such as an energy dissipater and associated pipes, may be allowed only if the applicant demonstrates, to the satisfaction of the City, that:
  - a. No other practical alternative exists; and
  - b. The functions and values of the buffer or the wetland are not adversely affected;

IH. Wetlands can be used for retention/detention facilities other than for regional facilities;

KI. Public and private trails may be allowed in wetland buffers only upon adoption of administrative rules consistent with the following:

1. The trail surface shall not be made of impervious materials, except that public, multi-purpose trails may be made of impervious materials if they meet all other requirements including water quality; and
2. Buffers shall be expanded, where possible, equal to the width of the trail corridor including disturbed areas;

LJ. A dock, pier, moorage, float or launch facility may be allowed, subject to the provisions of Shorelines Management Act, if:

1. The existing and zoned density around the wetland is three (3) dwelling units or more;
2. At least seventy-five percent (75%) of the lots around the wetland have been built upon and no significant buffer or wetland vegetation remains on these lots; and
3. Open water is a significant component of the wetland;

MK. Alterations to isolated wetlands may be allowed only as follows:

1. On sites less than twenty (20) acres in size, one (1) isolated wetland may be altered by relocating its functions into a new wetland on the site pursuant to an approved mitigation plan;
2. On sites of less than twenty (20) acres in size, up to three (3) isolated wetlands may be altered by combining their functions into one (1) or more replacement wetland on the site pursuant to an approved mitigation plan; and
3. Whenever an isolated wetland is altered pursuant to this subsection, the replacement wetland shall include enhancement for wildlife habitat;

NL. One (1) additional agricultural building or associated residence may be allowed within the wetland buffer on a grazed meadow if all hydrologic storage is replaced on the site;

OM. Subject to a clearing and grading permit issued pursuant to Chapter 15.445 Landscaping and Tree Retention SMC and other City Codes, the cutting of up to one (1) cord of firewood may be permitted in buffers of five (5) acres or larger in any year if the overall function of the buffer is not adversely affected. Removal of brush may also be permitted for the purpose of enhancing tree

growth if the area of removal is limited to the diameter of the tree canopy at the time of planting;

PN. Wetland road crossings may be allowed if:

1. The City determines that no alternative access is practical;
2. All crossings minimize impact to the wetland and provide mitigation for unavoidable impacts through restoration, enhancement or replacement of disturbed areas;
3. Crossings do not change the overall wetland hydrology;
4. Crossings do not diminish the flood storage capacity of the wetland; and
5. All crossings are constructed during summer low water periods.

#### **15.700.300 Wetlands – Alteration of Wetlands Historically and Continuously Used for Agricultural Purposes**

Class II and III wetlands that have been used for agricultural purposes for a minimum of fifty (50) continuous years may be altered subject to the following minimum requirements:

- A. The applicant/property owner can provide evidence that the wetland has been used for agricultural use continuously for fifty (50) years. This evidence, at a minimum, shall include aerial photographs of the site at the beginning of the fifty (50) year span of use. Aerial photographs of the site over the span of the use of the wetland for agricultural uses to the present shall be provided. At no time shall there be more than ten (10) years between the chronology of the photographs;
- B. If an agricultural wetland is located solely on one (1) parcel of property, no more than twenty-five percent (25%) of the wetland may be filled;
- C. If the altered wetland is located on more than one (1) property, no more than twenty-five percent (25%) of the entire wetland may be filled. The remainder of the wetland shall be enhanced as approved by the City provided it can be shown by a qualified wetlands biologist, approved by the City that:
  1. The enhancement of the remaining wetland shall provide the same or better hydrologic or biologic functions as the class of wetland identified in the wetland study for the site;
  2. If the altered wetland is located on more than one property, the entire altered wetland shall be identified; and

3. Any altered wetlands located in a flood hazard area shall conform with SMC 15.700.140 , Vegetation Management Plan through 15.700.240, Flood Hazard Area – Certification by an Engineer or Surveyor; and
- D. For altered wetlands that are located on more than one property, development rights may be transferred from one owner to the other for development within the altered wetland. This shall be done by a nonrevocable contract, as approved by the City. The transfer of property rights shall run with the land. In no case shall the transfer of development rights allow more than .99 acres of fill within an altered wetland.

## **15.700.~~300~~310 Wetlands – Mitigation Requirements**

### A. Mitigation Sequencing.

Before impacting any wetland or its buffer, an applicant shall demonstrate that the actions pursuant to SMC 15.700.120 (A) have been taken.

### B. Requirements for Compensatory Mitigation:

1. Compensatory mitigation for alterations to wetlands shall be used only
  - a. When impacts cannot be addressed by steps 1 through 4 of SMC 15.700.120(A);
  - b. And shall not apply to allowed alterations pursuant to SMC 15.700.285(F) or (G);
  - c. And shall achieve equivalent or greater biological functions.
2. Compensatory mitigation plans shall be consistent with this Chapter and *Wetland Mitigation in Washington State, Part 2: Developing Mitigation Plans, Version 1*, (Ecology Publication #06-06-011b) or as amended, and *Selecting Wetland Mitigation Sites Using a Watershed Approach (Western Washington)* (Publication #09-06-32, Olympia, WA, December 2009), or other best available science as recommended by Dept. of Ecology;
3. A performance bond or other approved financial surety is required before any project permits are issued. The purpose of the financial surety is to hold an applicant accountable for implementing the mitigation and monitoring plans. The release of financial surety is contingent on satisfactory completion by the applicant of the proposed construction mitigation and monitoring plans.
4. Mitigation ratios shall be consistent with Subsection G of this Section.

### C. Compensating for Lost or Affected Functions.

Compensatory mitigation shall address the functions affected by the proposed project, with an intention to achieve functional equivalency or improvement of functions. The goal shall be for the compensatory mitigation to provide similar wetland functions as those lost, except when either:

1. The lost wetland provides minimal functions, and the proposed compensatory mitigation action(s) will provide equal or greater functions or will provide functions shown to be limiting within a watershed through a formal Washington state watershed assessment plan or protocol; or

2. Out of kind replacement will best meet formally identified regional goals, such as replacement of historically diminished wetland types.

D. Preference of Mitigation Actions

Mitigation for lost or diminished wetland and buffer functions shall rely on the types below in the following order of preference:

1. Restoration (re-establishment and rehabilitation) of wetlands
  - a. The goal of re-establishment is returning natural or historic functions to a former wetland.
  - b. The goal of rehabilitation is repairing natural or historic functions of a degraded wetland.

2. Creation (establishment) wetlands on disturbed upland sites such as those with vegetative cover consisting primarily of non-native species or noxious weeds.

This should be attempted only when there is an adequate source of water and it can be shown that the surface and subsurface hydrologic regime is conducive to the wetland community that is anticipated in the design.

3. Enhancement of significantly degraded wetlands in combination with restoration or creation.

Enhancement should be part of a mitigation package that includes replacing the altered area and meeting appropriate ratio requirements. Applicants proposing to enhance wetlands or associated buffers shall demonstrate:

- a. How the proposed enhancement will increase the wetland's/buffer's functions and values;
  - b. How this increase in function will adequately compensate for the impacts; and
  - c. How all other existing wetland functions and values at the mitigation site will be protected.
4. Preservation of high-quality, at risk wetlands as compensation is generally acceptable when done in combination with restoration, creation, or enhancement, provided that a minimum of 1:1 acreage replacement is provided by re-establishment or creation. Ratios for preservation in combination with other forms of mitigation generally range from 10:1 to 20:1, as determined on a case-by-case basis, depending on the quality of the wetlands being altered and the quality of the wetlands being preserved.

E. Location of Compensatory Mitigation.

Mitigation actions shall be conducted within the same sub-drainage basin and on the site of the alteration except when all of the following apply:

1. There are no reasonable on-site or in sub-drainage basin opportunities, or on-site and in subdrainage basin opportunities do not have a high likelihood of success due to development pressures, adjacent land uses, or on-site buffers or connectivity are inadequate;
2. On site mitigation would require elimination of high quality upland habitat;
3. Off-site mitigation has a greater likelihood of providing equal or improved wetland functions; and
4. Off site locations shall be in the same sub-drainage basin and in the same Water Resource Inventory Area (WRIA) unless;
  - a. Established watershed goals for water quality, flood storage or conveyance, habitat, or other wetland functions and values have been established and strongly justify location of mitigation at another site; or
  - b. Credits from a state-certified wetland mitigation bank are used as compensation, and the use of credits is consistent with the terms of the certified bank instrument;
  - d. If compensatory wetland or wetland buffer mitigation is proposed off site, a signed statement of consent is required from owners of all affected properties. This statement shall be submitted to the city and a Notice recorded with the King County Recorder prior to approval of a compensatory mitigation plan.

F. Timing of Compensatory Mitigation

Mitigation shall be completed immediately following disturbance and prior to use or occupancy of the activity or development causing the wetland alteration.  
Construction of mitigation projects shall be timed to reduce impacts to existing wildlife and flora.

G. Wetland Mitigation Ratios:

In the following table the first number indicates the acreage of replacement wetlands and the second number indicates the acreage of wetlands altered.



<u>Category and Type of Wetland</u>	<u>Creation or Re-establishment</u>	<u>Rehabilitation</u>	<u>Enhancement</u>
Category I: Mature Forested	<u>6:1</u>	<u>12:1</u>	<u>24:1</u>
Category I: Based on Functions	<u>4:1</u>	<u>8:1</u>	<u>16:1</u>
Category II	<u>3:1</u>	<u>6:1</u>	<u>12:1</u>
Category III	<u>2:1</u>	<u>4:1</u>	<u>8:1</u>
Category IV	<u>1.5:1</u>	<u>3:1</u>	<u>6:1</u>

#### H. Illegal Alteration

1. When a wetland or its buffer has been altered in violation of this chapter, all ongoing development work on the site shall stop and the critical area shall be restored. The City shall have the authority to issue a "stop work" order, pursuant to SMC 1.15, to cease all ongoing development work and order restoration, rehabilitation, or replacement measures at the owner's or other responsible party's expense to compensate for violating provisions of this Chapter.

2.A Restoration shall be required when a wetland or its buffer is altered in violation of law or without any specific permission or approval by the City. The following minimum requirements shall be met for the restoration of a wetland:

1a. The original wetland structure, functions and values of the wetland configuration shall be restored replicated including hydrologic function, water quality and habitat functions; its depth, width, length and gradient at the original location;

2b. The original soil type and configuration shall be restored replicated;

3c. The wetland edge and buffer configuration shall be restored to its original condition; and

4d. The wetland, edge and buffer shall be replanted with vegetation native to the regional ecology City and King County which replicates the original vegetation in species, sizes and densities; and

5. The original wetland functions shall be restored including, but not limited to, hydrologic and biologic functions;

- 3B. The requirements in subsection 2 (A) may be modified if the applicant demonstrates that greater wetland functions can otherwise be obtained;

~~C. — Enhancement shall be required when a wetland or buffer will be altered pursuant to a development proposal. Minimum requirements for enhancement shall be established in the SEPA process but must maintain or improve the wetland's biologic and/or hydrologic functions;~~

~~D. — Replacement may be allowed when a wetland or buffer is altered pursuant to an approved development proposal if no reasonable opportunities exist for enhancement;~~

~~E. — All alterations of wetlands shall be replaced or enhanced on the site using the following formulas: Class I and II wetlands on a two (2) to one (1) basis and Class III on a one (1) to one (1) basis with equivalent or greater biologic functions including, but not limited to, habitat functions and with equivalent hydrologic functions, including, but not limited to, storage capacity;~~

~~F. — Replacement or enhancement off the site may be allowed if the applicant demonstrates to the satisfaction of the City that the off-site location is in the same drainage sub-basin as the original wetland and that greater biologic and hydrologic functions will be achieved. The formulas in subsection (E) shall apply to replacement and enhancement off the site; and~~

~~G. — Surface water management or flood control alterations including, but not limited to, wetponds shall constitute replacement or enhancement unless other functions are simultaneously improved.~~

#### ~~15.700.320 Wetlands Limited Exemption~~

~~Isolated wetlands less than one thousand (1,000) square feet may be exempted from the provisions of SMC 15.700.280, Wetlands Development Standards through 15.700.310, Wetlands Mitigation Requirements and may be altered by filling or dredging if the City determines that the cumulative impacts do not unduly counteract the purposes of this chapter and are mitigated pursuant to an approved mitigation plan.~~

Moved to section 15.700.280 and amended
--------------------------------------------

#### **15.700.330 Streams – Development Standards**

A development proposal on a site containing a stream shall meet the following requirements.

- A. The following minimum buffers shall be established from the ordinary high water mark (OHWM) or from the top of the bank if the OHWM cannot be identified:
1. A Class 1 stream shall have a one hundred (100) foot buffer;
  2. A Class 2 stream used by salmonids shall have a one hundred (100) foot buffer;

3. A Class 2 stream not used by salmonids shall have a fifty (50) foot buffer;
  4. A Class 3 stream shall have a twenty-five (25) foot buffer;
  5. Any stream restored, relocated, replaced or enhanced because of a stream alteration shall have the minimum buffer required for the stream class involved;
  6. Any stream with an OHWM within twenty-five (25) feet of the toe of a slope thirty percent (30%) or steeper, but less than forty percent (40%), shall have:
    - a. The minimum buffer required for the stream class involved or a twenty-five (25) foot buffer beyond the top of the slope, whichever is greater, if the horizontal length of the slope including small benches and terraces is within the buffer for that stream class; or
    - b. A twenty-five (25) foot buffer beyond the minimum buffer required for the stream class involved if the horizontal length of the slope including small benches and terraces extends beyond the buffer for that stream class; and
  7. Any stream adjoined by a riparian wetland or other contiguous sensitive critical area shall have the buffer required for the stream class involved or the buffer which applies to the wetland or other sensitive critical area, whichever is greater;
- B. Buffer width averaging may be allowed by the City if it will provide additional protection, as long as the total area contained in the buffer on the development proposal site does not decrease; and
- C. The use of hazardous substances, pesticides and fertilizers in the stream corridor and its buffer is prohibited unless specifically allowed by the City.

#### **15.700.340 Streams – Permitted Alterations**

Alterations to streams and buffers may be allowed only as follows:

- A. Alterations may only be permitted if based upon a special study;
- B. The applicant shall notify affected communities and native tribes of proposed alteration(s) prior to any alteration if the stream is in a flood hazard area. The applicant shall submit evidence of such notification to the Federal Insurance Administration;

- C. There shall be no introduction of any plant or wildlife which is not indigenous to the City or King County into any stream or buffer unless authorized by a State or Federal permit or approval by the City;
- D. Utilities may be allowed in stream buffers if:
  - 1. No practical alternative location is available;
  - 2. The utility corridor meets any additional requirements set forth in administrative rules including, but not limited to, requirements for installation, replacement of vegetation and maintenance;
  - 3. The requirements for sewer utility corridors (SMC 15.700.290, Wetlands – Permitted Alterations) shall also apply to streams; and
  - 4. Joint use of an approved sewer utility corridor by other utilities may be allowed;
- E. The following surface water management activities and facilities may be allowed in stream buffers as follows:
  - 1. Surface water discharge to a stream from a detention facility, presettlement pond or other surface water management activity or facility may be allowed if the discharge is in compliance with the Surface Water Design Manual;
  - 2. A Class 2 stream or buffer may be used for a regional retention/detention facility if:
    - a. A public agency and utility exception is granted pursuant to SMC 15.700.060, Exceptions;
    - b. Designed in accordance with the requirements of the Surface Water Design Manual;
    - c. The use will not alter the rating or the factors used in rating the stream;
    - d. There are no significant adverse impacts to the stream; and
  - 3. A Class 3 stream or buffer may be used as a regional retention/detention facility if the alteration will have no lasting adverse impact on any stream and if designed in accordance with the requirements of the Surface Water Design Manual;

F. Public and private trails may be allowed in the stream buffers only upon adoption of administrative rules consistent with the following:

1. The trail surface shall not be made of impervious materials, except that public multi-purpose trails may be made of impervious materials if they meet all other requirements including water quality; and
2. Buffers shall be expanded, where possible, equal to the width of the trail corridor including disturbed areas;

G. Stream crossings may be allowed if:

1. All road crossings use bridges or other construction techniques which do not disturb the stream bed or bank, except that bottomless culverts or other appropriate methods demonstrated to provide fisheries protection may be used for Class 2 and 3 streams if the applicant demonstrates that such methods and their implementation will pose no harm to the stream or inhibit migration of fish;
2. All crossings are constructed during the summer low flow and are timed to avoid stream disturbance during periods when use is critical to salmonids;
3. Crossings do not occur over salmonid spawning areas unless the City determines that no other possible crossing site exists;
4. Bridge piers or abutments are not placed within the FEMA floodway or the ordinary high water mark;
5. Crossings do not diminish the flood-carrying capacity of the stream;
6. Underground utility crossings are laterally drilled and located at a depth of four (4) feet below the maximum depth of the scour for the base flood predicted by a civil engineer licensed by the State of Washington; and
7. Crossings are minimized and serve multiple purposes and properties whenever possible;

H. Stream relocations may be allowed only for:

1. Class 2 streams as part of a public road project for which a public agency and utility exception is granted pursuant to SMC 15.700.060, Exceptions; and
2. Class 3 streams for the purpose of enhancing resources in the stream if:
  - a. Appropriate floodplain protection measures are used; and

- b. The relocation occurs on the site, except that relocation off the site may be allowed if the applicant demonstrates that any on-site relocation is impractical, the applicant provides all necessary easements and waivers from affected property owners and the off-site location is in the same drainage sub-basin as the original stream;
- I. For any relocation allowed by this section, the applicant shall demonstrate, based on information provided by a civil engineer and a qualified biologist, that:
  - 1. The equivalent base flood storage volume and function will be maintained;
  - 2. There will be no adverse impact to local groundwater;
  - 3. There will be no increase in velocity;
  - 4. There will be no interbasin transfer of water;
  - 5. There will be no increase in the sediment load;
  - 6. Requirements set out in the mitigation plan are met;
  - 7. The relocation conforms to other applicable laws; and
  - 8. All work will be carried out under the direct supervision of a qualified biologist;
- J. A stream channel may be stabilized if:
  - 1. Movement of the stream channel threatens existing residential or commercial structures, public facilities or improvements, unique natural resources or the only existing access to property; and
  - 2. The stabilization is done in compliance with the requirements of SMC 15.700.140, Vegetation Management Plan through 15.700.240, Flood Hazard Areas – Certification by an Engineer or Surveyor and administrative rules promulgated pursuant to this chapter;
- K. Stream enhancement not associated with any other development proposal may be allowed if accomplished according to a plan for its design, implementation, maintenance and monitoring prepared by a civil engineer and a qualified biologist and carried out under the direct supervision of a qualified biologist pursuant to provisions contained in administrative rules;
- L. A minor stream restoration project or fish habitat enhancement may be allowed if:

1. The restoration is accomplished by a public agency with a mandate to do such work;
  2. The restoration is unassociated with mitigation of a specific development proposal;
  3. The restoration does not cost more than twenty-five thousand dollars (\$25,000);
  4. The restoration is limited to placement of rock weirs, log controls, spawning gravel and other specific salmonid habitat improvements;
  5. The restoration only involves the use of hand labor and light equipment; and
  6. The restoration is performed under the direct supervision of a qualified biologist;
- M. Roadside and agricultural drainage ditches which carry streams with salmonids may be maintained through use of best management practices developed in consultation with relevant County, State, and Federal agencies. These practices shall be adopted as administrative rules; and
- N. Subject to a clearing and grading permit issued pursuant to tree retention requirements in SMC 15.445.140 through 15.445.148, the cutting of up to one (1) cord of firewood may be permitted in buffers of five (5) acres or larger in any year if the overall function of the buffer is not adversely affected. Removal of brush may also be permitted for the purpose of enhancing tree growth if the area of removal is limited to the diameter of the tree canopy at the time of planting.

#### **15.700.350 Streams – Mitigation Requirements**

- A. Restoration shall be required when a stream or its buffer is altered in violation of law or without any specific permission or approval by the City. A mitigation plan for the restoration shall demonstrate that:
1. The stream has been degraded and will not be further degraded by the restoration activity;
  2. The restoration will reliably and demonstrably improve the water quality and fish and wildlife habitat of the stream;
  3. The restoration will have no lasting, significant, adverse impact on any stream functions; and

4. The restoration will assist in stabilizing the stream channel;
- B. The following minimum requirements shall be met for the restoration of a stream:
1. All work shall be carried out under the direct supervision of a qualified biologist;
  2. Basin analysis shall be performed to determine hydrologic conditions;
  3. The natural channel dimensions shall be replicated including its depth, width, length and gradient at the original location, and the original horizontal alignment (meander lengths) shall be replaced;
  4. The bottom shall be restored with identical or similar materials;
  5. The bank and buffer configuration shall be restored to its original condition;
  6. The channel, bank and buffer areas shall be replanted with vegetation native to the City and King County which replicates the original vegetation in species, sizes and densities; and
  7. The original biologic functions of the stream shall be recreated;
- C. The requirements in subsection (B) may be modified if the applicant demonstrates to the satisfaction of the City that a greater biological function can otherwise be obtained;
- D. Replacement or enhancement shall be required when a stream or buffer is altered pursuant to an approved development proposal. There shall be no net loss of stream functions on a development proposal site and no impact on stream functions above or below the site due to approved alterations;
- E. The requirements which apply to the restoration of streams in subsection (B) shall also apply to the relocation of streams, unless the applicant demonstrates to the satisfaction of the City that a greater biological function can be obtained by modifying these requirements;
- F. Replacement or enhancement for approved stream alterations shall be accomplished in streams and on the site unless the applicant demonstrates to the satisfaction of the City:
1. Enhancement or replacement on the site is not possible;



2. The off-site location is in the same drainage sub-basin as the original stream; and
  3. Greater biological and hydrological functions will be achieved; and
- G. Surface water management or flood control alterations shall not be considered “enhancement” unless other functions are simultaneously improved.

**15.700.360 ~~Critical Recharging Areas~~ Aquifer Recharge Areas For Aquifers Used For Potable Water and Wellhead Protection Areas and General Groundwater Resources**

The aquifer identified as Q(A)c by the US Geological Survey is considered the major aquifer underlying SeaTac and other cities west of the Green River Valley (the “Des Moines Upland”), and is generally encountered between 100 ft. above and 100 ft. below sea level. A deeper aquifer indentified as Q(B)c is generally encountered between sea level and 200 ft. below sea level. These aquifers are the source of water for the wells in SeaTac operated by the Highline Water District and Seattle Public Utilities.

A. Purpose and Intent. It is the purpose and intent of the regulations in this Section to prevent contaminants from entering the aquifers serving as potable water sources, and to limit activities that may adversely effect groundwater resources more generally.

B. Application of Regulations in the Section. This section regulates uses and/or activities in the following areas:

1. Wellhead Protection Areas (WHPA) as delineated on the Wellhead Protection Areas Map (see Map 9.2 in the SeaTac Comprehensive Plan’s Environment Element).

The wellhead protection areas delineated on the referenced map were established by the water districts that operate these wells: Highline Water Districe and Seattle Public Utilities.

The Wellhead Protection Areas map is intended as a guide for the city, project applicants and/or property owners and may be updated as new information becomes available.

2. All other areas of the city.

C. Prohibited Uses

The following activities and uses are prohibited in Wellhead Protection Areas and all other areas of the city

1. Landfills. Landfills, including hazardous or dangerous waste, municipal solid waste, special waste, wood waste, and inert and demolition landfills

**2. Underground Injection Wells.** All underground injection wells as defined in Chapter 173-218 WAC with the exception of those listed in subsections a. through i. below. All underground injection wells shall comply with the requirements of WAC 173-218.

- a. Surface water management facilities pursuant to the Surface and Stormwater Management Code (SMC 12.10)
- b. Drainage wells such as those used to drain storm water such as a French drain or infiltration trench containing perforated pipe
- c. Heat pump or cooling water return flows wells
- d. Aquifer recharge wells
- e. Septic systems serving an individual residential property, or as otherwise approved by Public Health-Seattle and King County
- f. Injection wells used to control flooding of residential basements or as part of a reclaimed water project as allowed under a permit.
- g. Injection wells used for remediation wells receiving fluids intended to clean up, treat or prevent subsurface contamination
- h. Injection wells used as part of a reclaimed water project as allowed under a permit
- i. Injection wells used to inject carbon dioxide for geologic sequestration.

**3. Mining**

- a. Metals and hard rock mining; and
- b. Sand and gravel mining;

**4. Wood Treatment Facilities.** Wood treatment facilities that allow any portion of the treatment process to occur over permeable surfaces (both natural and manmade):

**5. Dry Cleaning Establishments.** Dry cleaning establishments using the solvent perchloroethylene.

**6. Storage, Processing, or Disposal of Radioactive Substances.** Facilities that store, process, or dispose of radioactive substances; and

**7. Other Prohibited Uses or Activities**

- a. Activities that would significantly reduce the recharge to aquifers currently or potentially used as a potable water source;
- b. Activities that would significantly reduce the recharge to aquifers that are a source of significant baseflow to a regulated stream.

**D. General Performance Standards:**

1. The proposed activity must be designed and constructed to employ all known, available and reasonable (AKART) methods of prevention, control and treatment of pollutants associated with a discharge;
2. The proposed activity must comply with the water source protection requirements and recommendations of the U.S. Environmental Protection Agency, Washington State Department of Health, and Public Health-Seattle and King County;
3. The proposed activity must be designed and constructed in accordance with the requirements of the Surface and Stormwater Management Code (SMC 12.10), the Clearing and Grading Code (SMC 13.190) and the International Building Code (SMC 13.110);
4. If applicable, the proposed activity must comply with the requirements of the International Fire Code (SMC 13.150).

**E. Development Within a Wellhead Protection Area:**

1. Any proposed non-residential development located in a Wellhead Protection Area shall submit a Hazardous Materials Inventory Sheet (HMIS) with any permit, land use, or business license application. Ongoing operation and maintenance activities of public wells by public water providers are exempt from these requirements.
2. The city will review the HMIS along with the permit, land use, or business license application to determine whether hazardous substances will be used, stored, transported or disposed of in connection with the proposed activity. The city shall make the following determinations and apply the appropriate measures:
  - a. No hazardous substances are involved, or;
  - b. Hazardous substances are involved; however, existing laws or regulations adequately mitigate any potential impact, and documentation is provided to demonstrate compliance, or;

- c. Hazardous substances are involved and the proposal has the potential to significantly impact wellhead protection areas or other groundwater resources. The city may require a Critical Area Report in order to determine the potential impacts of contamination on aquifers or other groundwater resources.
- 3. The Critical Area Report shall be prepared by a qualified professional, as specified in SMC 15.700.015, "Qualified Professional," and shall include the following site and proposal-related information:
  - a. Available information regarding geologic and hydrogeologic characteristics of the site including the permeability of the unsaturated zone;
  - b. Ground water depth, flow direction, and gradient based on available information;
  - c. Currently available data on wells and springs within 1,300 feet of the project site;
  - d. Location of other critical areas, including surface waters, within 1,300 feet of the project site;
  - e. Available historic water quality data for the area to be affected by the proposed activity; and
  - f. Best management practices proposed to be utilized.
  - g. Upon receipt of the Critical Area Report the department shall forward a copy of the Critical Area Report to the appropriate Water District for review and comment.

**F. Performance Standards, Specific: Applicable to specific uses**

- 1. Storage Tanks. All storage tanks must comply the terms of subsection D, above, and either a or b, below:
  - a. Underground Tanks. All new underground storage facilities proposed for use in the storage of hazardous substances or hazardous wastes shall be designed and constructed so as to:
    - i. Prevent releases due to corrosion or structural failure for the operational life of the tank;
    - ii. Be protected against corrosion, constructed of noncorrosive material, steel clad with a noncorrosive material, or designed to

include a secondary containment system to prevent the release or threatened release of any stored substances; and

iii. Use material in the construction or lining of the tank that is compatible with the substance to be stored.

b. **Above Ground Tanks.** All new above ground storage facilities proposed for use in the storage of hazardous substances or hazardous wastes shall be designed and constructed so as to:

i. Not allow the release of a hazardous substance to the ground, ground waters, or surface waters;

ii. Have a primary containment area enclosing or underlying the tank or part thereof; and

iii. A secondary containment system either built into the tank structure or a dike system built outside the tank for all tanks.

**2. Vehicle Repair, and Servicing.**

For the purposes of this subsection the term “vehicle repair and servicing” shall include, as defined in SMC 15.105, Automotive Service Center, Fueling/Service Station, Vehicle Repair, Small, and Vehicle Repair, Large.

a. Vehicle repair and servicing must be conducted over impermeable pads and within a covered structure capable of withstanding normally expected weather conditions. Chemicals used in the process of vehicle repair and servicing must be stored in a manner that protects them from weather and contains leaks should one occur.

b. No dry wells shall be allowed on sites used for vehicle repair and servicing. Dry wells existing on the site prior to facility establishment shall be abandoned using techniques approved by the state Department of Ecology prior to commencement of the proposed activity.

**3. Residential Use of Pesticides and Nutrients.** Application of household pesticides, herbicides, and fertilizers shall not exceed times and rates specified on the packaging.

**4. Use of Reclaimed Water for Surface Percolation or Direct Recharge.** Water reuse projects for reclaimed water must be in accordance with the adopted water or sewer comprehensive plans that have been approved by the state departments of Ecology and Health.

- a. Use of reclaimed water for surface percolation must meet the ground water recharge criteria given in Chapter 90.46.080(1) and Chapter 90.46.010(10) RCW. The state Department of Ecology may establish additional discharge limits in accordance with Chapter 90.46.080(2) RCW.
  - b. Direct injection must be in accordance with the standards developed by authority of Chapter 90.46.042 RCW.
- 5. State and Federal Regulations. The uses listed below shall be conditioned as necessary to protect critical aquifer recharge areas in accordance with the applicable state and federal regulations.

**Statutes, Regulations, and Guidance Pertaining to  
Ground Water Impacting Activities**

<b><u>Activity</u></b>	<b><u>Statute – Regulation - Guidance</u></b>
<u>Above Ground Storage Tanks</u>	<u>Chapter 173-303-640 WAC</u>
<u>Automobile Washers</u>	<u>Chapter 173-216 WAC, Best Management Practices for Vehicle and Equipment Discharges (Washington Department of Ecology WQ-R-95-56)</u>
<u>Below Ground Storage Tanks</u>	<u>Chapter 173-360 WAC</u>
<u>Chemical Treatment Storage and Disposal Facilities</u>	<u>Chapter 173-303 WAC</u>
<u>Injection Wells</u>	<u>Federal 40 CFR Parts 144 and 146, Chapter 173-218 WAC</u>
<u>Hazardous Waste Generator (Boat Repair Shops, Biological Research Facility, Dry Cleaners, Furniture Stripping, Motor Vehicle Service Garages, Photographic Processing, Printing and Publishing Shops, etc.)</u>	<u>Chapter 173-303 WAC</u>
<u>Junk Yards/Salvage Yards</u>	<u>Chapter 173-304 WAC, Best Management Practices to Prevent Stormwater Pollution at Vehicles Recycler Facilities (Washington State Department of Ecology 94-146)</u>
<u>Oil and Gas Drilling</u>	<u>Chapter 332-12 WAC, Chapter 173-218 WAC</u>
<u>On-Site sewage systems (Large Scale)</u>	<u>Chapter 173-240 WAC</u>
<u>On-Site Sewage Systems (&lt; 14,500 gal/day)</u>	<u>Chapter 246-272A WAC, Local Health Ordinances</u>
<u>Pesticide Storage and Use</u>	<u>Chapter 15.58 RCW, Chapter 17.21 RCW</u>
<u>Sawmills</u>	<u>Chapter 173-303 WAC, Chapter 173-304 WAC, Best Management Practices to Prevent Stormwater Pollution at Log Yards (Washington State Department of Ecology, 95-53)</u>
<u>Solid Waste Handling and Recycling Facilities</u>	<u>Chapter 173-304 WAC</u>
<u>Wastewater Application to Land Surface</u>	<u>Chapter 173-216 WAC, Chapter 173-200 WAC, Washington State Department of Ecology Land Application Guidelines, Best Management Practices for Irrigated Agriculture</u>
<u>Maintain groundwater quality</u>	<u>Chapter 173-200-030 WAC, Washington Antidegradation Policy</u>

~~A. Purpose. Potable water is an essential life-sustaining element. Once groundwater is contaminated, it is difficult, costly, and sometimes impossible to clean. Preventing contamination is necessary to avoid exorbitant costs, hardships, and potential physical harm to the public. It is the City's intent, through this section, to recognize the importance of aquifers and to acknowledge a responsibility common to all governmental agencies to ensure, as much as possible through each jurisdiction's~~

~~powers, the protection of health, safety and welfare of the public, the continued quantity and quality of groundwater supplies through the regulation of land uses which may contribute contamination that may degrade groundwater quality and/or quantity in recharge areas of vulnerability. The extent of regulation shall be based on the degree of vulnerability of an identified recharge area and the contaminant loading potential of the proposed land use.~~

~~B. Where it is determined through special studies or City mapping projects that soil and geologic formation permeability exists such that the presence of a groundwater recharge area is likely, the City Manager, or designee, may require further investigation by the applicant of the existence of recharge areas when the proposed land use involved is considered to be of a type or intensity that has a high contamination potential. Such uses may include, but are not limited to, planned unit developments, waste disposal sites, or agriculture activities.~~

~~C. Any additional required special studies shall address, but are not limited to, the following:~~

- ~~1. Depth of groundwater;~~
- ~~2. Aquifer properties such as hydraulic conductivity and gradients;~~
- ~~3. Soil texture, permeability, and contaminant attenuation properties;~~
- ~~4. Characteristics of the vadose zone (the unsaturated tip layer of soil and geologic material) including permeability and attenuation properties; or~~
- ~~5. Other relevant factors.~~

~~D. Based upon information provided in any required special report or study, the Department of Community and Economic Development shall determine conditions of development which will ensure, to the extent possible, no degradation of groundwater quantity or quality. Such conditions shall be attached to any permit required by the project proposal. (Ord. 11-1002 § 2; Ord. 95-1012 § 1; Ord. 92-1041 § 1)~~

### **15.700.370 Fish and Wildlife Habitat Conservation Areas**

A. Purpose. Fish and wildlife habitat conservation means land management for maintaining species in a wild state in suitable habitats within their natural geographic distribution so that isolated sub-populations are not created. This does not mean maintaining all individuals of all species at all times. It does mean that cooperative and coordinated land use planning is critically important among counties and cities in a region. In some cases, it may be sufficient to assure that a species will usually be found in certain regions across the State. In other cases, it may be necessary to assure protection to each individual species. Protection needs to be species specific and goal-oriented. Fish and wildlife habitat conservation areas include:

1. Areas with which endangered, threatened, and sensitive species, including anadromous fish, have a primary association;
2. Habitats and species of local importance (i.e., herons);



3. Naturally occurring lakes or ponds under twenty (20) acres and their submerged aquatic beds that provide fish or wildlife habitat;
4. Waters of the State;
5. Lakes, ponds, and streams planted with game fish by a governmental or tribal entity.

"Fish and wildlife habitat conservation areas" does not include such artificial features or constructs as irrigation delivery systems, irrigation infrastructure, irrigation canals, or drainage ditches that lie within the boundaries of and are maintained by a port district or an irrigation district or company.

The provisions of this of this chapter do not apply to any habitat areas which come under the jurisdiction of the Shoreline Management Program.

- B. Fish and wildlife habitat conservation areas may, and probably will, include one (1) or more of other ~~sensitive-critical~~ areas identified in this chapter. The following classification system is based on the presence of one (1) or more of these ~~sensitive-critical~~ areas as well as species identified as endangered, threatened, sensitive, or priority, the area's proximity to developed areas, and the area's existing use.
1. Category 1 habitat is classified as including any wetland or stream or their buffer areas or any area identified as habitat for endangered, threatened, sensitive or priority species by the State Department of Wildlife (DOW) or heron, and which is characterized by agricultural or low density residential use (one (1) unit or less per acre) and which is not within two hundred (200) feet of more intense land uses.
  2. Category 2 habitat is classified as including any wetland or stream or their buffer areas or any area identified as habitat for endangered, threatened, sensitive, or priority species by the DOW and which is characterized by residential uses of greater density than one (1) unit per acre or which lies within two hundred (200) feet of more intense land uses.
  3. Category 3 habitat is classified as an area which does not include a wetland or stream or their buffer areas or any area identified as habitat for endangered, threatened, sensitive or priority species by the DOW and which is characterized by single-family residential areas immediately adjacent to multifamily or nonresidential land uses.
  4. Category 4 habitat is classified as an area which does not include a wetland or stream or their buffer areas or any area identified as habitat for endangered, threatened, sensitive, or priority species by the DOW and which is characterized by nonresidential land uses.

- C. Buffers. For any fish and wildlife habitat conservation areas which include other ~~sensitive-critical~~ areas as identified and regulated in this chapter, the buffer for those ~~sensitive-critical~~ areas shall apply except where species identified by the DOW as endangered, threatened, sensitive, or priority, or where herons are found to have a primary association. If such species are present, the applicant shall provide a critical area report ~~special study~~ identifying such species, their required habitat, and recommend appropriate buffers based on the DOW priority habitat and species management recommendations as well as any other proposed mitigation measures considered appropriate to the protection of said species and habitat.

## Exhibit B

# SMC Chapter 15.700

### **Division VII. ~~Environmentally Sensitive~~ Critical Areas**

#### **CHAPTERS:**

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#### **15.700 ~~Environmentally Sensitive~~ Critical Areas**

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## **Chapter 15.700**

### **Environmentally Sensitive Critical Areas**

#### **SECTIONS:**

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- 15.700.005 Purpose**
- 15.700.010 Authority and Application**
- 15.700.015 Definitions**
- 15.700.020 Appeals**
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#### **15.700.005 Purpose**

The purpose of this chapter is to implement the goals and policies of the Washington State Environmental Policy Act, Chapter 43.21C RCW, and the SeaTac Comprehensive Plan which call for protection of the natural environment and the public health and safety by:

- A. Establishing development standards to protect defined sensitive-critical areas;
- B. Protecting members of the public, public resources and facilities from injury, loss of life, property damage or financial loss due to flooding, erosion, landslides, seismic and soil subsidence or steep slope failures;
- C. Protecting unique, fragile and valuable elements of the environment including, but not limited to, wildlife and its habitat;
- D. Requiring mitigation of unavoidable impacts on environmentally sensitive critical areas by regulating alterations in or near sensitive-critical areas;
- E. Preventing cumulative adverse environmental impacts on water availability, water quality, wetlands and streams;

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- F. Measuring the quantity and quality of wetland and stream resources and preventing overall net loss of wetland and stream functions and values;
- G. Protecting the public trust as to navigable waters and aquatic resources;
- H. Meeting the requirements of the National Flood Insurance Program and maintaining SeaTac as an eligible community for federal flood insurance benefits;
- I. Alerting members of the public including, but not limited to, appraisers, owners, real estate agents, potential buyers or lessees to the development limitations of sensitive-critical areas; and
- J. Providing City officials with sufficient information to protect critical areas.

### 15.700.010 Authority and Application

- A. The provisions of this chapter shall apply to all land uses in the City and property owners within the City shall comply with the requirements of this chapter;
- B. The City shall not approve any permit or issue any authorization to alter the condition of any land, water or vegetation or to construct any structure or improvement without first assuring compliance with the requirements of this chapter; and
- ~~C. The provisions of this of this chapter do not apply to any habitat areas which come under the jurisdiction of the Shoreline Management Program.~~
- ~~D.E.~~ When any provision of any other chapter of the SeaTac Municipal Code conflicts with this chapter or when the provisions of this chapter are in conflict, that provision which provides more protection to environmentally sensitive areas shall apply unless specifically provided otherwise in this chapter or unless such provision conflicts with Federal or State laws or regulations.

### 15.700.015 Definitions

#### Alteration

Alterations include, but are not limited to, grading, filling, channelizing, dredging, clearing of vegetation, construction, compaction, excavation, or any other activity that changes the character of a critical area or its buffer.

#### **Base Flood**

A flood having a one percent (1%) chance of being equaled or exceeded in any given year, often referred to as the "100-year flood."

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### **Base Flood Elevation**

The water surface elevation of the base flood in relation to the National Geodetic Vertical Datum of 1929.

### **Buffer or Buffer Zone**

The area contiguous with a critical area that maintains the functions and/or structural stability of the critical area.

### **Creation**

The manipulation of the physical, chemical, or biological characteristics to develop a wetland on an upland or deepwater site, where a wetland did not previously exist. Creation results in a gain in wetland acreage and function. A typical action is the excavation of upland soils to elevations that will produce a wetland hydroperiod and hydric soils, and support the growth of hydrophytic plant species

### **Sensitive-Critical Area**

Any of those areas in the City which are subject to natural hazards or those land features which support unique, fragile or valuable natural resources including fishes, wildlife and other organisms and their habitat, and such resources which carry, hold or purify water in their natural state. Sensitive-Critical areas include coal mine hazard areas, erosion hazard areas, flood hazard areas, landslide hazard areas, seismic hazard areas, steep slope hazard areas, streams, volcanic hazard areas, and wetlands and critical aquifer recharge areas. For purposes of this chapter, Wellhead Protection Areas and general groundwater resources are not considered to be critical aquifer recharge areas.

### **Critical Drainage Area**

An area which has been formally defined in the City Surface Water Management Program to require more restrictive regulation than is standard in noncritical areas of the City in order to mitigate severe flooding, water quality issues, erosion or sedimentation problems which result from the cumulative impacts of development and urbanization.

### **Enhancement**

The manipulation of the physical, chemical, or biological characteristics of a wetland to heighten, intensify, or improve specific function(s) or to change the growth stage or composition of the vegetation present. Enhancement is undertaken for specified purposes such as water quality improvement, flood water retention, or wildlife habitat. Enhancement results in a change in wetland function(s) and can lead to a decline in other wetland functions, but does not result in a gain in wetland acres. Examples are planting vegetation, controlling non-native or invasive species, and modifying site elevations to alter hydroperiods.

### **Erosion and Deposition**

The removal of soils and the placement of these removed soils elsewhere by the natural forces of wind and/or water runoff.

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### **Federal Emergency Management Agency (FEMA) Floodway**

The channel of the stream and that portion of the adjoining floodplain which is necessary to contain and discharge the base flood flow without increasing the base flood elevation more than one (1) foot.

### **Flood Fringe**

That portion of the floodplain outside of the zero-rise floodway (See Floodway, Zero-Rise) which is covered by floodwater during the base flood, generally associated with standing water rather than rapidly flowing water.

### **Flood Hazard Areas**

Those areas in the City subject to inundation by the base flood including, but not limited to, streams, lakes, wetlands and closed depressions.

### **Flood Insurance Rate Map (FIRM)**

The official map on which the Federal Insurance Administration has delineated some of the major areas of flood hazard.

### **Flood Insurance Study for King County**

The official report provided by the Federal Insurance Administration which includes flood profiles and the flood insurance rate map.

### **Floodplain**

The total area subject to inundation by the base flood.

### **Floodproofing**

Adaptations, pursuant to the Building Code, which will make a structure that is below the flood protection elevation substantially impermeable to the passing of water and resistant to hydrostatic and hydrodynamic loads including the impacts of buoyancy.

### **Flood Protection Elevation**

An elevation which is one (1) foot above the base flood elevation.

### **Floodway, Zero-Rise**

The channel of a stream and that portion of the adjoining floodplain which is necessary to contain and discharge the base flood flow without any measurable increase in flood height. A measurable increase in base flood height means a calculated upward rise in the base flood elevation, equal to or greater than .01 foot, resulting from a comparison of existing conditions and changed conditions directly attributable to development in the floodplain. This definition is broader than that of the FEMA floodway, but always includes the FEMA floodway. The boundaries of the one hundred (100) year floodplains, as shown on the FIRM maps for King County, are considered the boundaries of the zero-rise floodway unless otherwise delineated by a ~~sensitive-critical area~~ special study.



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### **Functions and Values**

The services provided by critical areas to society, including but not limited to, improving and maintaining water quality, providing fish and wildlife habitat, supporting terrestrial and aquatic food chains, reducing flooding and erosive flows, wave attenuation, historical or archaeological importance, educational opportunities, and recreation.

### **Hazardous Production Material (HPM)**

A solid, liquid or gas that has a degree of hazard rating in health, flammability or reactivity of 3 or 4 as ranked by Fire Code Standard No. 79-3 and which is used directly in research, laboratory or production processes which have, as their end product, materials which are not hazardous.

### **Hazardous Substances**

Any solid, liquid, gas or sludge, including any material, substance, product, commodity or waste, regardless of quantity, that exhibits any of the physical, chemical or biological properties described in WAC 173-303-090 or 173-303-100.

### **Mitigation of Environmental Impacts**

The use of any or all of the following actions, listed in descending order of preference:

- A. ———— Avoiding the impact by not taking a certain action
- B. ———— Minimizing the impact by limiting the degree of magnitude of the action by using appropriate technology or by taking affirmative steps to avoid or reduce the impact;
- C. ———— Rectifying the impact by repairing, rehabilitating or restoring the affected sensitive area or buffer;
- D. ———— Reducing or eliminating the impact over time by preservation or maintenance operations during the life of the development proposal;
- E. ———— Compensating for the impact by replacing, enhancing, or providing substitute sensitive areas and environments; and
- F. ———— Monitoring the impact and taking appropriate corrective measures.

### **Ordinary High Water Mark**

The mark found by examining the bed and banks of a stream and ascertaining where the presence and action of waters are common and long maintained in ordinary years as to mark upon the soil a vegetative character distinct from that of the abutting upland. In any area where the ordinary high water mark cannot be found, the line of mean high water shall substitute. In any area where neither can be found, the top of the channel or lake bank shall substitute. In braided channels and alluvial fans, the ordinary high water mark or line of mean high water shall be measured so as to include the entire stream feature.

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### **Qualified Professional**

A person with experience and training in the pertinent scientific discipline, and who is a qualified scientific expert with expertise appropriate for the relevant critical area subject in accordance with WAC 365-195-905. A qualified professional must have obtained a B.S. or B.A. or equivalent degree in biology, engineering, environmental studies, fisheries, geomorphology, or related field, and have at least five years of related work experience.

- (a) A qualified professional for wetlands must be a professional wetland scientist or hydrogeologist licensed in the state of Washington with at least two years of full-time work experience as a wetlands professional, including delineating wetlands using the federal manuals and supplements, preparing wetlands reports, conducting function assessments, and developing and implementing mitigation plans.
- (b) A qualified professional for habitat must have a degree in biology or a related degree and professional experience related to the subject species.
- (c) A qualified professional for a geological hazard must be a professional engineer or geologist, licensed in the state of Washington.
- (d) A qualified professional for critical aquifer recharge areas means a hydrogeologist, geologist, or engineer licensed in the state of Washington, or other scientist with experience in preparing hydrogeologic assessments.

### **Re-establishment**

The manipulation of the physical, chemical, or biological characteristics of a site with the goal of returning natural or historic functions to a former wetland. Re-establishment results in rebuilding a former wetland and results in a gain in wetland acres and functions. Activities could include removing fill, plugging ditches, or breaking drain tiles.

### **Regulated Wetland**

A wetland that meets one or more of the following criteria:

- A. Serves significant biological functions;
- B. Serves significant drainage and sedimentation functions;
- C. Shields other areas from wave action, erosion or storm damage;
- D. Serves as valuable storage area for storm and flood waters;
- E. Is a prime natural recharge area;
- F. Serves significant water purification functions.

Although a site specific wetland may not meet the criteria described above, it will be considered a regulated wetland if it is functionally related to another wetland that meets

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~~the criteria. Within the wetlands classification process there are the following classes: Class I, Class II, and Class III (See "Wetland" definition.)~~

### **Rehabilitation**

The manipulation of the physical, chemical, or biological characteristics of a site with the goal of repairing natural or historic functions and processes of a degraded wetland.

Rehabilitation results in a gain in wetland function but does not result in a gain in wetland acres. Activities could involve breaching a dike to reconnect wetlands to a floodplain or returning tidal influence to a wetland.

### **Restoration**

Measures taken to restore an altered or damaged natural feature, including:

1. Active steps taken to restore damaged wetlands, streams, protected habitat, or their buffers to the functioning condition that existed prior to an unauthorized alteration; and
2. Actions performed to re-establish structural and functional characteristics of a critical area that have been lost by alteration, past management activities, or catastrophic events.

~~Returning a stream, wetland or other sensitive area or any associated buffer to a state in which its stability and functions approach its unaltered (or original) state as closely as possible~~

### **Retention/Detention Facility**

A type of drainage facility designed either to hold water for a considerable length of time and to release it by evaporation, plant transpiration and/or infiltration into the ground, or to hold runoff via structural controls and then release it to the surface and storm drainage system.

### **Retention/Detention Facility, Regional**

A surface water control structure installed in or adjacent to a drainage facility, stream or wetland of a basin or sub-basin by the City or a project proponent, as required by the City. Such facilities protect downstream properties from predicted significant regional basin flooding or erosion problems.

### **Seismic Hazard Area**

~~(Denoted on critical areas maps.)~~ Those areas in the City subject to severe risk of earthquake damage as a result of soil liquefaction in areas underlain by cohesionless soils of low density and usually in association with a shallow groundwater table or other seismically induced settlement.

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### SEPA

The State Environmental Policy Act (Chapter 43.21C RCW) and the adopted City environmental policies.

### Shoreline Master Program

The applicable City and State laws/codes related to the shoreline programs.

### Steep Slope Hazard Areas

Those areas in the City on slopes of forty percent (40%) or greater within a vertical elevation change of at least ~~ten-twenty~~ (20+0) feet. A slope is delineated by establishing its toe and top, and is measured by averaging the inclination over at least ten (10) feet of vertical relief.

### Stream

A course or route, formed by nature, including those modified by man, generally consisting of a channel with a bed, banks, or sides substantially throughout its length, along which surface waters naturally and normally flow in draining from higher to lower lands. Normal rainfall is rainfall that is at or near the mean of the accumulated annual rainfall record, based upon the water year as recorded at the Seattle-Tacoma International Airport. Pursuant to the ~~sensitive-critical~~ areas section, there are the following stream classifications:

- A. Class 1 streams, only including streams inventoried as "Shorelines of the State" under the adopted Shoreline Master Program, pursuant to Chapter 90.58 RCW;
- B. Class 2 streams, only including streams smaller than Class 1 streams which flow year-round during years of normal rainfall or those which are used by salmonids; and
- C. Class 3 streams, only including streams which are intermittent or ephemeral during years of normal rainfall and which are not used by salmonids.

### Stream Functions

Natural processes performed by streams including functions which are important in facilitating food chain production; providing habitat for nesting, rearing and resting sites for aquatic, terrestrial and avian species; maintaining the availability and quality of water, such as purifying water; acting as recharge and discharge areas for groundwater aquifers; moderating surface and storm water flows and maintaining the free flowing conveyance of water, sediments and other organic matter.

### Wetland

Those areas in the City which ~~that~~ are inundated or saturated by ~~ground or surface water~~ or ground water at a frequency and duration sufficient to support, and ~~that~~ under normal circumstances do support, a prevalence of vegetation ~~typically adapted for life in~~ saturated soil conditions. ~~According to the 33 CFR 328.3 (1988), w~~Wetlands generally include swamps, marshes, bogs and similar areas. Wetlands do not include those artificial

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wetlands intentionally created from non-wetland sites including but not limited to, irrigation and drainage ditches, grass-lined swales, canals, detention facilities, wastewater treatment facilities, farm ponds, and landscape amenities, or those wetlands created after July 1, 1990, that were unintentionally created as a result of the construction of a road, street, or highway. Wetlands may include those artificial wetlands intentionally created from non-wetland areas to mitigate conversion of wetlands. Where the vegetation has been removed or substantially altered, a wetland shall be determined by the presence or evidence of hydric or organic soil, as well as by other documentation, such as aerial photographs of the previous existence of wetland vegetation. When the areas of any wetlands are hydrologically connected to each other, they shall be added together to determine which of the following categories of wetlands apply:

~~A. Class I Wetland. Only includes wetlands assigned the Unique/Outstanding #1 rating in the 1983 King County Wetlands Inventory (or the most recent City inventory) or which meet any of the following criteria:~~

- ~~1. Are wetlands which have present species listed by the Federal or State government as endangered or threatened or outstanding actual habitat for those;~~
- ~~2. Are wetlands which have forty percent (40%) to sixty percent (60%) permanent open water in dispersed patches with two (2) or more classes of vegetation;~~
- ~~3. Are wetlands equal to or greater than ten (10) acres in size and have three (3) or more wetland classes, one of which is open water;~~
- ~~4. Are wetlands which have present plant associations of infrequent occurrence;~~
- ~~5. Sphagnum or peat wetlands; or~~
- ~~6. Forested wetlands equal to or greater than one (1) acre in size.~~

~~B. Class II Wetland. Only includes wetlands assigned the Significant #2 rating in the 1983 King County Wetlands Inventory (or the most recent City inventory) or which meet any of the following criteria:~~

- ~~1. Are wetlands greater than one (1) acre in size; or~~
- ~~2. Are wetlands equal to or less than one (1) acre in size and have three (3) or more wetland classes; or~~
- ~~3. Are forested wetlands less than one (1) acre in size but are larger than two thousand five hundred (2,500) square feet; or~~
- ~~4. Are wetlands which have present heron rookeries or raptor nesting trees.~~

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~~C. Class III Wetland. Only includes wetlands assigned the Lesser Concern #3 rating in the 1983 King County Wetlands Inventory (or most recent City inventory) or which are wetlands equal to or less than one (1) acre in size and have two (2) or fewer wetland classes. This does not include drainage ditches used as part of an approved public storm drainage system that may support wetland vegetation or retention/detention systems.~~

### **Wetland Edge**

The line delineating the outer edge of a wetland established in accordance with the approved federal wetland delineation manual and applicable regional supplements by using the 1987 U.S. Army Corps of Engineers Wetlands Delineation Manual in conjunction with the Washington Regional Guidance on the 1987 Wetland Delineation Manual dated May 23, 1994.

### **Wetland, Forested**

A wetland with at least thirty percent (30%) of the surface area covered which is characterized by woody vegetation greater than at least twenty (20) feet in height that is at least partially rooted within the wetland-tall.

### **Wetland Functions**

Natural processes performed by wetlands including functions which are important in facilitating food chain production, providing habitat for nesting, rearing and resting sites for aquatic, terrestrial and avian species, maintaining availability and quality of water, acting as recharge and discharge areas for groundwater aquifers and moderating surface and storm water flows, as well as providing other functions including, but not limited to, those set forth in 33 CFR 320.4(b)(2), 1988.

### **Wetland, Isolated**

A wetland that is outside of and not contiguous to any 100-year flood plain of a lake, river or which has a total size less than two thousand five hundred (2,500) square feet excluding buffers, which is hydrologically isolated from other wetlands or streams, and has no contiguous hydric soil or hydrophytic vegetation between the wetland and any surface which does not have permanent open water, including other wetlands.

### **Wetland Mitigation Bank**

A site where wetlands are restored, created, enhanced, or in exceptional circumstances, preserved expressly for the purpose of providing compensatory mitigation in advance of unavoidable impacts to wetlands or other aquatic resources that typically unknown at the time of certification to compensate for future, permitted impacts to similar resources.

### **Wetland Mosaic**

An area with a concentration of multiple small wetlands, in which each patch of wetland is less than one acre; on average, patches are less than 100 feet from each other; and areas delineated as vegetated wetland are more than 50% of the total area of the entire mosaic, including uplands and open water

**Wet Meadow, Grazed**

Palustrine emergent wetland typically having up to six (6) inches of standing water during the wet season and dominated under normal conditions by meadow emergents such as reed, canary grass, spike rushes, bulrushes, sedges and other rushes. During the growing season, the soil is often saturated but not covered with water. These meadows frequently have been or are being used for livestock activities.

**Wet Pond**

An artificial water body constructed as a part of a surface water management system.

**15.700.020 Appeals**

Any decision to approve, condition or deny a development proposal based on the requirements of Chapter 15.700 ~~Environmentally Sensitive Critical Areas~~ SMC may be appealed according to, and as part of, the appeal procedure for the permit or approval involved.

**15.700.030 ~~Sensitive Critical Area~~ Rules**

Applicable City departments are authorized to adopt administrative rules and regulations as are necessary and appropriate to implement Chapter 15.700 ~~Environmentally Sensitive Critical Areas~~ SMC, and to prepare and require the use of such forms as are necessary for its administration.

**15.700.040 Complete Exemptions**

The following are exempt from the provisions of this chapter and any administrative rules promulgated thereunder:

- A. Emergencies which threaten the public health, safety and welfare or which pose an imminent risk of damage to private and public property as long as any alteration undertaken pursuant this subsection is reported to the Department and Department of Public Works immediately, upon which the Director(s) shall either confirm that an emergency exists or determine if further permit review or mitigation is necessary;
- B. Agricultural activities in existence before November 27, 1990 as follows:
  - 1. Mowing of hay, grass or grain crops;
  - 2. Tilling, dicing, planting, seeding, harvesting and related activities for pasture, food crops, grass seed or sod if such activities do not take place on steep slopes; and
  - 3. Normal and routine maintenance of existing irrigation and drainage ditches not used by salmonids;
- C. Public water, electric and natural gas distribution, public and private sewer collection, storm water systems to include retention/detention ponds, cable

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communications, telephone distribution and collection system, and related activities undertaken pursuant to City approved best management practices, as follows:

1. Normal and routine maintenance or repair of existing utility structures or rights-of-way;
  2. Relocation of electric facilities, lines, equipment or appurtenances, not including substations, with an associated voltage of fifty-five thousand (55,000) volts or less, only when required by a local governmental agency which approves the new location of facilities;
  3. Replacement, operation, repair, modification or installation or construction in an improved city road right-of-way of all electric facilities, lines, equipment or appurtenances, not including substations, with an associated voltage of fifty-five thousand (55,000) volts or less;
  4. Relocation or maintenance of sanitary and storm sewer systems, public water local distribution, natural gas, cable communication or telephone distribution and collection facilities, lines, pipes, ditches, mains, equipment or appurtenances, only when required by a local governmental agency which approves the new location of the facilities; and
  5. Replacement, operation, repair, modification, installation or construction in an improved City road right-of-way of public local collection, public water distribution, natural gas, cable communication or telephone facilities, lines, pipes, mains, equipment or appurtenances;
- D. Improvements, on-going maintenance, operation, repair or replacement of public roadways and pedestrian improvements in an improved public road right-of-way in existence prior to November 27, 1990 which, at a minimum, is improved with an all-weather driving surface (with any associated shoulders);
- E. Construction and improvements of unimproved public rights-of-way in existence prior to November 27, 1990;
- F. Improvements, on-going maintenance, operation, repair or replacement of public roadways and pedestrian improvements in an improved public road right-of-way constructed after November 27, 1990, in conformance with this chapter which, at a minimum, is improved with an all-weather driving surface (with any associated shoulders);
- G. Emergent wetlands that have been created directly as the result of poorly maintained public storm drainage systems and would have not been created if the storm drainage system had otherwise been maintained;



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- H. Public agency development proposals only to the extent of any construction contract awarded before November 27, 1990; provided, that any law or regulation in effect at the time of such award shall apply to the proposal.

### **15.700.050 Partial Exemptions**

The following are exempt from the provisions of this and any administrative rules promulgated thereunder, except for the notice on title provisions, SMC 15.700.160 Notice of Title, and the flood hazard area provisions, SMC 15.700.200 Flood Hazard Areas - Components through 15.700.240 Flood Hazard Areas – Certification by an Engineer or Surveyor:

- A. Structural modification of, addition to, or replacement of structures, except single-family detached residences, in existence before November 27, 1990, which do not meet the building setback or buffer requirements for wetlands, streams or steep slope hazard areas if the modification, addition, replacement or related activity does not increase the existing footprint of the structure lying within the above-described building setback area, ~~sensitive-critical~~ area or buffer;
- B. Structural modification of, addition to, or replacement of single-family detached residences in existence before November 27, 1990, which do not meet the building setback or buffer requirements for wetland, streams or steep slope hazard areas if the modification, addition, replacement or related activity does not increase the existing footprint of the residence lying within the above-described buffer or building setback area by more than one thousand (1,000) square feet over that existing before November 27, 1990, and no portion of the modification, addition or replacement is located closer to the ~~sensitive-critical~~ area or, if the existing residence is in the ~~sensitive-critical~~ area, extends further in the ~~sensitive-critical~~ area; and
- C. Maintenance or repair of structures which do not meet the development standards of this chapter for landslide and seismic hazard areas if the maintenance or repair does not increase the footprint of the structure, and there is no increased risk to life or property as a result of the proposed maintenance or repair.

### **15.700.060 Exceptions**

- A. If the application of this chapter would prohibit a development proposal by a public agency or public utility, the agency or utility may apply for an exception pursuant to this subsection:
  - 1. The public agency or utility shall apply to the Department and shall make available to the Department other related project documents such as permit applications to other agencies, special studies and SEPA documents. The Department shall prepare a recommendation to the Hearing Examiner;

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2. The Hearing Examiner shall review the application and conduct a public hearing pursuant to the provisions of Chapter 15.115 Land Use Actions and Procedures SMC. The Hearing Examiner shall make a recommendation to the City Council based on the following criteria:
  - a. There is no other practical alternative to the proposed development with less impact on the ~~sensitive-critical~~ area; and
  - b. The proposal minimizes the impact on ~~sensitive-critical~~ areas;
3. This exception shall not allow the use of the following ~~sensitive-critical~~ areas for regional retention/detention facilities except where there is a clear showing that the facility will protect public health and safety or repair damaged natural resources:
  - a. Class 1 streams or buffers;
  - b. Class I wetlands or buffers with plant association of infrequent occurrence; or
  - c. Class I or II wetlands or buffers which provide critical or outstanding habitat for herons, raptors or State or Federal designated endangered or threatened species unless clearly demonstrated by the applicant that there will be no impact on such habitat.
  - d. See subsection 15.700.290(L)(2) for additional criteria

B. If the application of this chapter would deny all reasonable use of the property, the applicant may apply for an exception pursuant to this subsection:

1. The applicant shall apply to the Department who shall prepare a recommendation to the Hearing Examiner. The applicant may apply for a reasonable use exception without first having applied for a variance if the requested exception includes relief from standards for which a variance cannot be granted pursuant to the provisions of this code.
2. The Hearing Examiner shall review the application in consultation with the City Attorney and shall conduct a public hearing pursuant to the provisions of Chapter 15.115 Land Use Actions and Procedures SMC. The Hearing Examiner shall make a final decision based on the following criteria:
  - a. The application of this chapter would deny all reasonable use of the property;

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- b. There is no other reasonable use with less impact on the sensitive critical area;
  - c. The proposed development does not pose an unreasonable threat to the public health, safety or welfare on or off the development proposal site and is consistent with the general purposes of this chapter and the public interest; and
  - d. Any alterations permitted to the sensitive-critical area shall be the minimum necessary to allow for reasonable use of the property.
3. Any authorized alteration of a sensitive-critical area under this subsection shall be subject to conditions established by the Hearing Examiner including, but not limited to, mitigation under an approved mitigation plan.

### **15.700.070 Critical Area Maps and Inventories**

The distribution of environmentally sensitive-critical areas in the City is displayed on maps in the Environment Element of the city's Comprehensive Plan, available Sensitive Areas Map Folio by King County from the Community and Economic Development Department and through the city's website. Many of the wetlands are inventoried and rated, and that information is published in the SeaTac Wetlands Inventory Notebooks. Flood Hazard areas are mapped by the Federal Insurance Administration. If there is a conflict among the maps, inventory and site-specific features, the actual presence or absence of the features defined in this code as sensitive-critical areas shall govern.

### **15.700.080 Disclosure by Applicant**

- A. The applicant shall disclose to the City the presence of sensitive-critical areas on the development proposal site.
- B. If the development proposal site contains or is within a sensitive-critical area, the applicant shall submit an affidavit which declares whether the applicant has knowledge of any illegal alteration to any or all sensitive-critical areas on the development proposal site and whether the applicant previously has been found in violation of this chapter. If the applicant previously has been found in violation, the applicant shall declare whether such violation has been corrected to the satisfaction of the City.

### **15.700.090 Sensitive Critical Area Review**

- A. The City shall perform a sensitive area review for any SeaTac development proposal, permit application, or other request for permission to proceed with an alteration on a site which includes a sensitive-potential or confirmed critical area or is within an identified sensitive area buffer, or building setback area.
- B. As part of the sensitive area review, the City shall:

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- ~~1. Determine whether any sensitive area exists on the property and confirm its nature and type;~~
12. Determine whether a sensitive critical area report special study is required;
23. Evaluate the sensitive critical area report special study;
34. Determine whether the development proposal is consistent with this chapter;
45. Determine whether any proposed alteration to the sensitive critical area is necessary; and
56. Determine if the mitigation and monitoring plans and bonding measures proposed by the applicant are sufficient to protect the public health, safety and welfare, consistent with the goals, purposes, objectives and requirements of this chapter.

### 15.700.100 Sensitive Critical Area Report Special Study Requirement

- A. An applicant for a development proposal which ~~includes requires a sensitive Critical Area Report pursuant to Section 15.700.090 or is within an identified critical area buffer shall~~ submit a Critical Area Report that complies with the requirements of this chapter, ~~enter into a three (3) party agreement, as approved by the City, whereby the applicant shall pay the costs for the City to hire the appropriate consultant(s) to provide a sensitive area special study to adequately evaluate the proposal and all probable impacts. The selection of the consultant(s) hired by the City shall be at the sole discretion of the City.~~
- B. The Director shall maintain a roster of qualified professionals from which the applicant may select a consultant. If the applicant uses a qualified professional from this roster, the City will accept the results of the report and will not require peer review of the report.

~~If the Critical Area Report concludes that the proposed development site does not contain a critical area or buffer, the City shall apply a credit to the cost of the applicant's subsequent development permit(s), provided that such application, along with proof of payment for the report, is submitted within 180 days of submittal of the Critical Area Report. The credit shall be in the amount of the cost of the Critical Area report, up to the cost of the development permit(s). In no case shall the credit exceed the cost of the development permit(s).~~

- C. Alternatively, if the applicant chooses to use a consultant not on the City's roster of qualified professionals as provided in subsection (B) of this section, the applicant shall enter into a three (3) party agreement, as approved by the City, whereby the applicant shall pay the costs for the City to hire the appropriate

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consultant(s) ~~from the roster to provide peer review of the applicant's a sensitive-Critical Aarea Report special study to adequately evaluate the proposal and all probable impacts.~~ The selection of the consultant(s) hired by the City shall be at the sole discretion of the City.

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DB. The City may waive the requirement for a Critical Area Report special study if the applicant shows, to the City's satisfaction, that:

1. There will be no alteration of the sensitive-critical area or buffer;
2. The development proposal will not have an impact on the sensitive-critical area in a manner contrary to the goals, purposes, objectives and requirements of this chapter; and
3. The minimum standards required by this chapter are met.

EC. If necessary to insure compliance with this chapter, the City may require additional information from the applicant or consultant pursuant to the agreement specified in subsection (CA) of this section.

### **15.700.110 Contents of Sensitive-Critical Area ReportSpecial Study**

A. The sensitive-critical area report special study shall be based on the best available science as defined in WAC 365-195-900 through 925, as amended, and shall be conducted by a qualified professional(s).

B. The critical area report shall be in the form of a written report and shall contain the following:

1. Identification and characterization of all sensitive-critical areas on or encompassing the development proposal site;
2. Assessment of the impacts of any alteration proposed for a sensitive critical area or buffer, as applicable, assessment of the impacts of any alteration on the development proposal, other properties and the environment;
3. Studies which propose adequate mitigation, maintenance, monitoring and contingency plans and bonding measures;
4. A scale map of the development proposal site; and
5. Detailed studies, as required by the City.

CB. A sensitive-critical area report special study may be combined with any studies required by other laws and regulations.

### **15.700.120 Mitigation, Maintenance, Monitoring and Contingency**

- A. Before impacting any critical area or its buffer, an applicant shall demonstrate that the following actions have been taken. Actions are listed in the order of preference: As determined by the City, mitigation, maintenance and monitoring measures shall be in place to protect sensitive areas and buffers from alterations occurring on the development proposal site.
- ~~A-1. Avoid the impact altogether by not taking a certain action, or parts of an action.~~
- ~~B-2. Minimizing the impact. Minimize impacts~~ by limiting the degree or magnitude of the action ~~and its implementation,~~ by using appropriate technology, or by taking affirmative steps to avoid or reduce the ~~impact; impacts.~~
- ~~C-3. Rectifying. Rectify~~ the impact by repairing, rehabilitating, or restoring the affected sensitive area or buffer; ~~environment.~~
- ~~D-4. Reducing. Reduce or eliminating/eliminate~~ the impact over time by preservation ~~and~~ maintenance operations during the life of the development proposal;
- ~~E-5. Compensating. Compensate~~ for the impact by replacing, enhancing, or providing substitute sensitive areas and ~~resources or environments; and,~~
- ~~F-6. Monitoring. Monitor the impact; required compensation and taking appropriate~~ remedial or corrective measures, ~~when necessary.~~
- ~~B. Where monitoring reveals a significant deviation from predicted impacts or a failure of mitigation or maintenance measures, the applicant shall be responsible for appropriate corrective action which, when approved, shall be subject to further monitoring.~~

### **15.700.130 Bonds to Insure Mitigation, Maintenance and Monitoring**

- A. When mitigation required pursuant to a development proposal is not completed prior to the City finally approving the proposal, the City may delay final approval until mitigation is completed or may require the applicant to post a performance bond or other security in a form and amount deemed acceptable by the City. The bond shall be sufficient to guarantee that all required mitigation measures will be completed no later than the time established by the City in accordance with this chapter.
- B. If the development proposal is subject to mitigation, maintenance or monitoring plans, the applicant shall post a maintenance/monitoring bond or other security in a form and amount deemed acceptable by the City. The bond shall be sufficient to guarantee performance of conditions or mitigation measures required by this chapter for a period of up to five (5) years. The duration of

maintenance/monitoring obligations shall be established by the City, based upon the nature of the proposed mitigation, maintenance or monitoring and the likelihood and expense of correcting mitigation or maintenance failures.

- C. Performance and maintenance/monitoring bonds or other security shall also be required for restoration of a ~~sensitive-critical~~ area or buffer not performed as part of a mitigation or maintenance plan, except that no bond shall be required for minor stream restoration carried out pursuant to this chapter. The bond or other security shall be in a form and amount deemed acceptable by the City.
- D. Performance and maintenance/monitoring bonds or other security authorized by this section shall remain in effect until the City determines, in writing, that the standards bonded for have been met.
- E. Depletion, failure or collection of bond funds shall not discharge the obligation of an applicant or violator to complete required mitigation, maintenance, monitoring or restoration.
- F. Development proposals made by the City shall be relieved from having to comply with the bonding requirements of this section if public funds have previously been committed for mitigation, maintenance, monitoring or restoration.

**15.700.140 Vegetation Management Plan**

- A. For all development proposals where preservation of existing vegetation is required by this chapter, a vegetation management plan shall be submitted and approved prior to issuance of the permit or other request for permission to proceed with any alteration.
- B. The vegetation management plan shall identify the proposed clearing limits for the project and any areas where vegetation in a ~~sensitive-critical~~ area or its buffer is proposed to be disturbed.
- C. Where clearing includes cutting any merchantable stand of timber, as defined in WAC 222-16-010(28), the vegetation management plan shall include a description of proposed logging practices which demonstrates how all critical areas will be protected in accordance with the provisions of this chapter.
- D. Clearing limits as shown on the plan shall be marked in the field in a prominent and durable manner. Proposed methods of field marking shall be reviewed and approved by the City prior to any site alteration. Field marking shall remain in place until the certificate of occupancy or final project approval is granted.
- E. The vegetation management plan may be incorporated into a temporary erosion and sediment control plan or landscaping plan where either of these plans is required by other laws or regulations.

- F. Submittal requirements for vegetation management plans shall be set forth in the application packet.

**15.700.150 ~~Sensitive-Critical~~ Area Markers and Signs**

- A. Permanent survey stakes delineating the boundary between adjoining properties and ~~sensitive-critical~~ area tracts shall be set, using iron or concrete markers as established by current survey standards.
- B. The boundary between a ~~sensitive-critical~~ area tract and contiguous land shall be identified with permanent signs, printed in two (2) international languages.
- C. In all new developments, short plats, and formal subdivisions, all storm drains shall be stenciled "Dump No Waste, Drains to Stream" prior to the occupancy of any structures within the new development, or prior to the occupancy of any new residence within the short plat or formal subdivision.

**15.700.160 Notice on Title**

- A. The owner of any property containing ~~sensitive-critical~~ areas or buffers on which a development proposal is submitted, except a public right-of-way or the site of a permanent public facility, shall file a covenant approved by the City with the King County Records and Elections Division. The required contents and form of the notice shall be set forth in administrative rules. The notice shall inform the public of the presence of ~~sensitive-critical~~ areas or buffers on the property, of the application of this chapter to the property, and that limitations on actions in or affecting such ~~sensitive-critical~~ areas or buffers may exist. The covenant shall run with the land.
- B. The applicant shall submit proof that the notice has been filed for public record before the City shall approve any development proposal for the property or, in the case of subdivisions, short subdivisions, and binding site plans, at or before recording.

**15.700.170 ~~Sensitive-Critical~~ Area Tracts and Designation on Site Plans**

- A. ~~Sensitive-Critical~~ area tracts shall be used to delineate and protect those ~~sensitive-critical~~ areas and buffers listed below in development proposals for subdivisions, binding site plans and easements for short plats and other developments, and shall be recorded on all documents of title of record for all affected lots:
  - 1. All landslide hazard areas and buffers which are one (1) acre or greater in size;
  - 2. All steep slopes hazard areas and buffers which are one (1) acre or greater in size;



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3. All wetlands and buffers; and
  4. All streams and buffers.
- B. Any required ~~sensitive-critical~~ area tract shall be held in undivided interest by each owner of a building lot within the development, with this ownership interest passing with the ownership of the lot, or shall be held by an incorporated homeowner's association or other legal entity which assures the ownership, maintenance and protection of the tract.
- C. Site plans submitted as part of development proposals for building permits, master plan developments and clearing and grading permits shall include and delineate all landslide and steep slope hazard areas, streams and wetlands, buffers and building setbacks. The site plans shall be attached to the notice on title required by SMC 15.700.160, Notice on Title.

### 15.700.180 Building Setbacks

Unless otherwise provided, buildings and other structures shall be set back a distance of fifteen (15) feet from the edges of all ~~sensitive-critical~~ area buffers or from the edges of all ~~sensitive-critical~~ areas if no buffers are required. The following may be allowed in the building setback area:

- A. Landscaping;
- B. Uncovered decks;
- C. Building overhangs if such overhangs do not extend more than eighteen (18) inches into the setback area; and
- D. Impervious ground surfaces, such as driveways and patios; provided, that such improvements may be subject to special drainage provisions specified in City policies and rules adopted for the various ~~sensitive-critical~~ areas.

Critical Area buffer requirements may be found in the Development Standards section for each type of critical area.

The following Sensitive Areas Setback Requirements Chart specifies setback buffers and additional building setbacks. The setback buffers specified are minimum requirements, and may be increased based on special studies completed by qualified professionals pursuant to SMC 15.700.290, Wetlands Permitted Alterations.

	SETBACK BUFFER	BUILDING SETBACK FROM BUFFER
Class I Wetland	100 feet	15 feet
Class II Wetland	50 feet	15 feet

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Class III Wetland	25 feet	15 feet
Class 1 Stream	100 feet	15 feet
Class 2 Stream with Salmonids	100 feet	15 feet
Class 2 Stream	50 feet	15 feet
Class 3 Stream	25 feet	15 feet
Slopes 40% or greater	50 feet from top, toe, or side of slope	N/A
Landslide Hazard Areas	50 feet from all edges of the landslide hazard area	N/A

**15.700.190 Erosion Hazard Areas – Development Standards and Permitted Alterations**

- A. Clearing on an erosion hazard area is allowed only from April 1st to September 1st, except that:
1. Up to fifteen thousand (15,000) square feet may be cleared on any lot, subject to any other requirement for vegetation retention and subject to any clearing and grading permit required by Chapter 15.445 Landscaping and Tree Retention SMC; and
  2. Timber harvest may be allowed pursuant to an approved forest practice permit issued by the Washington Department of Natural Resources or a clearing and grading permit issued by the City.
- B. All development proposals on sites containing erosion hazard areas shall include a temporary erosion control plan consistent with this section and other laws and regulations prior to receiving approval.
- C. All subdivisions, short subdivisions or binding site plans on sites with erosion hazard areas shall comply with the following additional requirements:
1. Except as provided in this section, existing vegetation shall be retained on all lots until building permits are approved for development on individual lots;
  2. If any vegetation on the lots is damaged or removed during construction of the subdivision infrastructure, the applicant shall be required to submit a restoration plan to the City for review and approval. Following approval, the applicant shall be required to implement the plan;
  3. Clearing of vegetation on lots may be allowed without a separate clearing and grading permit if the City determines that:

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- a. Such clearing is a necessary part of a large scale grading plan;
  - b. It is not feasible to perform such grading on an individual lot basis; and
  - c. Drainage from the graded area will meet water current quality standards ~~to be established by administrative rules.~~
- D. Where the City determines that erosion or water quality from a development site poses a significant risk of damage to downstream receiving waters, based either on the size or characteristics of the project or proposed use, ~~the potential of molecular water runoff from the highest, most vertical steel or wooden surface of a structure, more commonly known as a roof, to the roof of an alloy/enamel covered motorized automobile to an impervious surface (including, but not limited to, paved and gravel parking lots) inter-mixed with petroleum by-products, the proximity to the receiving water or the sensitivity of the receiving water or the fishes, the applicant shall be required to provide regular monitoring of surface water discharge from the site. If the project does not meet current water quality standards, established by law or administrative rules, the City may suspend further development work on the site until such standards are met.~~
- E. The use of hazardous substances, pesticides and fertilizers in erosion hazard areas may be prohibited by the City under the applicable RCW statutes.

### **15.700.200 Flood Hazard Areas – Components**

- A. A flood hazard area consists of the following components:
- 1. Floodplain;
  - 2. Flood fringe;
  - 3. Zero-rise floodway; and
  - 4. Federal Emergency Management Agency (FEMA) floodway.
- B. The City shall determine the flood hazard area after obtaining, reviewing and utilizing base flood elevations and available floodway data for a flood having a one (1) percent chance of being equaled or exceeded in any given year, often referred to as the “one hundred (100) year flood.” The base flood is determined for existing conditions unless a basin plan including projected flows under future developed conditions has been completed, approved and adopted by the City, in which case these future flow projections shall be used. In areas where the flood insurance study for the City includes detailed base flood calculations, those calculations may be used until projection of future flows are completed and approved by the City in concurrence with FEMA.

**15.700.210 Flood Fringe – Development Standards and Permitted Alterations**

- A. Development proposals shall not reduce the effective base flood storage volume of the floodplain. Grading or other activity which would reduce the effective storage volume shall be mitigated by creating compensatory storage on the site or off the site if legal arrangements can be made to ensure that the effective compensatory storage volume will be preserved over time.
- B. No structure shall be allowed which would be at risk due to stream bank destabilization including, but not limited to, that associated with channel relocation or meandering.
- C. All elevated construction shall be designed and certified by a professional structural engineer licensed by the State of Washington and shall be reviewed by the City prior to construction.
- D. Subdivisions, short subdivisions and binding site plans shall meet the following requirements:
  - 1. New building lots shall contain five thousand (5,000) square feet or more of buildable land outside the zero-rise floodway, and building setback areas shall be shown on the face of the plat to restrict permanent structures to this buildable area;
  - 2. All utilities and facilities such as sewer, gas, electrical, and water systems shall be located and constructed consistent with subsections (E), (F), (H) and (I) of this section;
  - 3. Base flood data and flood hazard notes shall be shown on the face of the recorded subdivision, short subdivision or binding site plan including, but not limited to, the base flood elevation, required flood protection elevations and the boundaries of the floodplain and the zero-rise floodway, if determined; and
  - 4. The following notice shall also be shown on the face of the recorded subdivision, short subdivision, or binding site plan for all affected lots:

NOTICE

Lots and structures located within flood hazard areas may be inaccessible by emergency vehicles during flood events. Residents and property owners should take appropriate advance precaution.

- E. New residential structures and substantial improvements of existing residential structures shall meet the following requirements:

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1. The lowest floor shall be elevated above the official floodplain elevation;
  2. Portions of a structure which are below the lowest floor area shall not be fully enclosed. The areas and rooms below the lowest floor shall be designed to automatically equalize hydrostatic and hydrodynamic flood forces on exterior walls by allowing for the entry and exit of floodwaters. Designs for satisfying this requirement shall meet or exceed the following requirements:
    - a. A minimum of two (2) openings on opposite walls having a total open area of not less than one (1) square inch for every square foot of enclosed area subject to flooding shall be provided;
    - b. The bottom of all openings shall be no higher than one (1) foot above grade; and
    - c. Openings may be equipped with screens, louvers or other coverings or devices if they permit the unrestricted entry and exit of floodwaters;
  3. Materials and methods which are resistant to, and minimize, flood damage shall be used; and
  4. All electrical, heating, ventilation, plumbing, air conditioning equipment and other utility and service facilities shall be floodproofed to or elevated above the flood protection elevation.
- F. New nonresidential structures and substantial improvements of existing nonresidential structures shall meet the following requirements:
1. The elevation requirement for residential structures contained in subsection (E)(1) shall be met; or
  2. The structure shall be floodproofed to the flood protection elevation and shall meet the following requirements:
    - a. The applicant shall provide certification by a professional civil or structural engineer licensed by the State of Washington that the floodproofing methods are adequate to withstand the flood depths, pressures, velocities, impacts, uplift forces and other factors associated with the base flood. After construction, the engineer shall certify that the permitted work conforms with the approved plans and specifications; and
    - b. Approved building permits for floodproofed, nonresidential structures shall contain a statement notifying the applicant that flood

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insurance premiums shall be based upon rates for structures which are one (1) foot below the floodproofed level;

3. Materials and methods which are resistant to and minimize flood damage shall be used; and
4. All electrical, heating, ventilation, plumbing, air-conditioning equipment and other utility and service facilities shall be floodproofed to or elevated above the flood protection elevation.

G. Mobile homes and mobile home parks shall meet the following requirements:

1. Mobile homes shall meet all requirements for flood hazard protection for residential structures and shall be anchored and installed using Building Code methods and practices which minimize flood damage; and
2. No permit or approval for the following shall be granted unless mobile homes within the mobile home park meet the requirements for flood hazard protection for residential structures:
  - a. A new mobile home park;
  - b. An expansion of an existing mobile home park; or
  - c. Annual repair or reconstruction of streets, utilities or pads in an existing mobile home park which equals or exceeds fifty percent (50%) of the value of such streets, utilities or pads.

H. Utilities shall meet the following requirements:

1. New and replacement utilities including, but not limited to, sewage treatment facilities shall be floodproofed to or elevated above the flood protection elevations;
2. New, on-site sewage disposal systems shall be, to the extent possible, located outside the limits of the base flood elevation. The installation of new, on-site sewage disposal systems in the flood fringe may be allowed if no feasible alternative site is available;
3. Sewage and agricultural waste storage facilities shall be floodproofed to the flood protection elevation;
4. Above-ground utility transmission lines, other than electric transmission lines, shall only be allowed for the transport of nonhazardous substances; and

5. Buried utility transmission lines transporting hazardous substances shall be buried at a minimum depth of four (4) feet below the maximum depth of scour for the base flood, as determined by a professional civil engineer licensed by the State of Washington, and shall achieve sufficient negative buoyancy so that any potential for flotation or upward migration is eliminated.
- I. Critical facilities may be allowed within the flood fringe of the floodplain, but only when no feasible alternative site is available. Critical facilities shall be evaluated through the major conditional use permit process. Critical facilities constructed within the flood fringe shall have the lowest floor elevated to three (3) or more feet above the base flood elevation. Floodproofing and sealing measures shall be taken to ensure that hazardous substances will not be displaced by or released into the floodwaters. Access routes elevated to or above the base flood elevation shall be provided to all critical facilities from the nearest maintained public street or roadway.
- J. Prior to approving any permit for alterations in the flood fringe, the City shall determine that all permits required by State or Federal law have been obtained.

**15.700.220 Zero-Rise Floodway – Development Standards and Permitted Alterations**

- A. The requirements which apply to the flood fringe shall also apply to the zero-rise floodway. The more restrictive requirements shall apply where there is a conflict.
- B. A development proposal including, but not limited to, new or reconstructed structures shall not cause any increase in the base flood elevation unless the following requirements are met:
  1. Amendments to the Flood Insurance Rate Map are adopted by FEMA, in accordance with 44 CFR 70, to incorporate the increase in the base flood elevation; and
  2. Appropriate legal documents are prepared in which all property owners affected by the increased flood elevations consent to the impacts on their property. These documents shall be filed with the title of record for the affected properties.
- C. The following are presumed to produce no increase in base flood elevation and shall not require a special study to establish this fact:
  1. New residential structures outside the FEMA floodway on lots in existence before November 27, 1990, which contain less than five thousand (5,000) square feet of buildable land outside the zero-rise

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- floodway and which have a total building footprint of all proposed structures on the lot of less than two thousand (2,000) square feet;
2. Substantial improvements of existing residential structures in the zero-rise floodway, but outside the FEMA floodway, where the footprint is not increased; or
  3. Substantial improvements of existing residential structures meeting the requirements for new residential structures in SMC 15.700.220.
- D. Post or piling construction techniques which permit water flow beneath a structure shall be used.
- E. All temporary structures or substances hazardous to public health, safety and welfare, except for hazardous household substances or consumer products containing hazardous substances, shall be removed from the zero-rise floodway during the flood season from September 30th to May 1st.
- F. New residential or nonresidential structures shall meet the following requirements:
1. The structures shall be outside the FEMA floodway; and
  2. The structures shall be on lots in existence before November 27, 1990, which contain less than five thousand (5,000) square feet of buildable land outside the zero-rise floodway.
- G. Utilities may be allowed within the zero-rise floodway if the City determines that no feasible alternative site is available, subject to the following requirements:
1. Installation of new on-site sewage disposal systems shall be prohibited unless a waiver is granted by the Seattle/King County Department of Public Health; and
  2. Construction of sewage treatment facilities shall be prohibited.
- H. Critical facilities shall not be allowed within the zero-rise floodway.
- I. Structures and installations which are dependent upon the floodway may be located in the floodway if the development proposal is approved by all agencies with jurisdiction. Such structures include, but are not limited to:
1. Dams or diversions for water supply, flood control, irrigation or fisheries enhancement;



2. Flood damage reduction facilities, such as levees and pumping stations;
3. Stream bank stabilization structures where no feasible alternative exists for protecting public or private property;
4. Storm water conveyance facilities subject to the development standards for streams and wetlands and the Surface Water Design Manual;
5. Recreation structures;
6. Bridge piers and abutments; and
7. Other fisheries enhancement or stream restoration projects.

**15.700.230 FEMA Floodway – Development Standards and Permitted Alterations**

- A. The requirements which apply to the zero-rise floodway shall also apply to the FEMA floodway. The more restrictive requirements shall apply where there is a conflict.
- B. A development proposal including, but not limited to, new or reconstructed structures shall not cause any increase in the base flood elevation.
- C. New residential or nonresidential structures are prohibited within the FEMA floodway.
- D. Substantial improvements of existing residential structures in the FEMA floodway meeting the requirements of WAC 173-158-070, as amended, are presumed to produce no increase in base flood elevation and shall not require a special study to establish this fact.

**15.700.240 Flood Hazard Areas – Certification by an Engineer or Surveyor**

- A. For all new structures or substantial improvements in a flood hazard area, the applicant shall provide certification by a professional civil engineer or land surveyor licensed by the State of Washington of:
  1. The actual, as-built elevation of the lowest floor, including basement; and
  2. The actual, as-built elevation to which the structure is floodproofed, if applicable.
- B. The engineer or surveyor shall indicate if the structure has a basement.
- C. The City shall maintain the certifications required by this section for public inspection.

**15.700.250 Landslide Hazard Areas – Development Standards and Permitted Alterations**

A development proposal on a site containing a landslide hazard area shall meet the following requirements:

- A. A minimum buffer of fifty (50) feet shall be established from all edges of the landslide hazard area. The buffer shall be extended as required to mitigate a steep slope or erosion hazard or as otherwise necessary to protect the public health, safety and welfare;
- B. Unless otherwise provided herein, or as part of an approved alteration, removal of any vegetation from a landslide hazard area or buffer shall be prohibited, except for limited removal of vegetation necessary for surveying purposes and for the removal of hazard trees determined to be unsafe according to tree selection rules promulgated pursuant to this chapter. Notice to the City shall be provided prior to any vegetation removal permitted by this subsection;
- C. Vegetation on slopes within a landslide hazard area or buffer which has been damaged by human activity or infested by noxious weeds may be replaced with vegetation native to the City pursuant to an enhancement plan approved by the City. The use of hazardous substances, pesticides and fertilizers in landslide hazard areas and their buffers may be prohibited by the City under the applicable RCW statutes; and
- D. Alterations to landslide hazard areas and buffers may be allowed only as follows:
  - 1. A landslide hazard area located on a slope of forty percent (40%) or steeper may be altered only if the alteration meets the standards and limitations set forth for steep slope hazard areas in SMC 15.700.270, Steep Slope Hazard Areas – Development Standards and Permitted Alterations;
  - 2. A landslide hazard area located on a slope less than forty percent (40%) may be altered only if the alteration meets the following requirements:
    - a. The development proposal will not decrease slope stability on contiguous properties; and
    - b. The landslide hazard area is modified or the development proposal is designed so that the landslide hazard to the project and contiguous property is limited or mitigated, and the development proposal on the site is determined to be safe by the City based on a study prepared by a geologist or geotechnical engineer; and

3. Neither buffers nor a ~~sensitive-critical~~ area tract shall be required if the alterations meet the standards of subsection (D)(2) of this section.

**15.700.260 Seismic Hazard Areas – Development Standards and Permitted Alterations**

A development proposal on a site containing a seismic hazard area shall meet the following requirements:

- A. Unless exempt, development proposals shall be subject to review standards based on two (2) occupancy types: critical facilities and other structures. The review standards for critical facilities shall be based on larger earthquake reoccurrence intervals. The review standards for both occupancy types shall be set forth in administrative rules;
- B. Alterations to seismic hazard areas may be allowed only as follows:
  1. The evaluation of site-specific subsurface conditions shows that the proposed development site is not located in a seismic hazard area; or
  2. Mitigation is implemented which renders the proposed development as safe as if it were not located in a seismic hazard area; and
- C. The following are exempt from the provisions of this section:
  1. Mobile homes; and
  2. Single story, nonresidential structures which are less than two thousand five hundred (2,500) square feet and are not used as places of employment or public assembly.

**15.700.270 Steep Slope Hazard Areas – Development Standards and Permitted Alterations**

A development proposal on a site containing a steep slope hazard area shall meet the following requirements:

- A. A minimum buffer of fifty (50) feet shall be established from the top, toe and along all sides of any slope forty percent (40%) or steeper. The buffer shall be extended as required to mitigate a landslide or erosion hazard or as otherwise necessary to protect the public health, safety and welfare. The buffer may be reduced to a minimum of ten (10) feet if, based on a Critical Area Report, ~~special study~~ the City determines that the reduction will adequately protect the proposed development and the ~~sensitive-critical~~ area. For single-family residential building permits only, the City may waive the special study requirement and authorize buffer reductions if the City determines that the reduction will adequately protect the proposed development and the ~~sensitive critical~~ area;

- B. Unless otherwise provided herein or as part of an approved alteration, removal of any vegetation from a steep slope hazard area or buffer shall be prohibited, except for limited removal of vegetation necessary for surveying purposes and for the removal of hazard trees determined to be unsafe according to tree selection rules promulgated pursuant to this chapter. Notice to the City shall be provided prior to any vegetation removal permitted by this subsection;
- C. Vegetation on steep slopes within steep slope hazard areas or their buffers which has been damaged by human activity or infested by noxious weeds may be replaced with vegetation native to the region pursuant to a vegetation management plan approved by the City. The use of hazardous substances, pesticides and fertilizers in steep slope hazard areas and their buffers may be prohibited by the City;
- D. Alterations to steep slope hazard areas and buffers may be allowed only as follows:
  - 1. Approved surface water conveyances, as specified in the Surface Water Design Manual, may be allowed on steep slopes if they are installed in a manner to minimize disturbance to the slope and vegetation;
  - 2. Public and private trails may be allowed on steep slopes if they receive site-specific approval by the City, as guided by the construction and maintenance standards in the U.S. Forest Service "Trails Management Handbook," FSH 2309.18, June 1987, as amended, and the "Standard Specifications for Construction of Trails" (EM-7720-102, June 1984, as amended). Under no circumstances shall trails be constructed of concrete, asphalt or other impervious surfaces which will contribute to surface water run-off, unless such construction is necessary for soil stabilization or soil erosion prevention or unless the trail system is specifically designed and intended to be accessible to handicapped person(s);
  - 3. Utility corridors may be allowed on steep slopes if a special study shows that such alterations will not subject the area to the risk of landslide or erosion;
  - 4. Limited trimming and pruning of vegetation may be allowed on steep slopes pursuant to an approved vegetation management plan for the creation and maintenance of views if the soils are not disturbed and the activity is subject to administrative rules; and
  - 5. Approved mining and quarrying activities may be allowed; and
- E. The following are exempt from the provisions of this section:

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1. Slopes which are forty percent (40%) or steeper with a vertical elevation change of up to twenty (20) feet if no adverse impact will result from the exemption based on the City's review of and concurrence with a soils report prepared by a geologist or geotechnical engineer; and
2. The approved regrading of any slope which was created through previous legal grading activities. Any slope which remains forty percent (40%) or steeper following site development shall be subject to all requirements for steep slopes.

### **15.700.275 Wetlands – Identification and Rating**

- A. Identification of wetlands and delineation of their boundaries pursuant to this Chapter shall be done in accordance with the approved federal wetland delineation manual and applicable regional supplement. All areas within the city meeting the wetland designation criteria in that procedure are hereby designated critical areas and are subject to the provisions of this Chapter. Wetland delineations are valid for five years; after which time the City may determine whether a revision or additional assessment is necessary.
- B. Wetlands shall be rated according to the Washington Department of Ecology wetland rating system, as set forth in the *Washington State Wetland Rating System for Western Washington: 2014 Update* (Ecology Publication #04-06-029, or as revised and approved by Ecology), which contains the definitions, methods and criteria for determining a wetland's categorization as Category I, II, III or IV.
- C. Wetland rating categories shall not change due to illegal modifications.

### **15.700.280320 Wetlands – Limited Exemption**

The following ~~isolated wetlands less than one thousand (1,000) square feet may be exempted from the requirement provisions of to avoid impacts (SMC 15.700.120.A.1) 15.30.290 through 15.30.320 and may be filled altered by filling or dredging if the City determines that the cumulative impacts do not unduly counteract the purposes of this chapter and are fully mitigated based on the actions in SMC 15.700.120.A.5 and A.6, mitigated pursuant to an approved mitigation plan.~~

- A. All isolated Category III and IV wetlands less than 1,000 square feet that:
  1. Are not associated with riparian areas or buffers
  2. Are not part of a wetland mosaic
  3. Do not contain habitat identified as essential for local populations of priority species identified by the Washington Department of Fish and Wildlife.

### **15.700.285280 Wetlands – Development Standards**

A development proposal on a site containing a wetland shall meet the following requirements:

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A. ~~The following minimum buffers shall be established from the wetland edge:~~

- ~~1. A Class I wetland shall have a one-hundred (100) foot buffer;~~
- ~~2. A Class II wetland shall have fifty (50) foot buffer;~~
- ~~3. A Class III wetland shall have thirty-five (35) foot buffer;~~
- ~~4. Any wetland restored, relocated, replaced or enhanced because of a wetland alteration shall have the minimum buffer required for the wetland class involved; and~~
- ~~5. Any wetland within twenty-five (25) feet of the toe of a slope thirty percent (30%) or steeper, but less than forty percent (40%), shall have:~~
  - ~~a. The minimum buffer required for the wetland class involved or a twenty-five (25) foot buffer beyond the top of the slope, whichever is greater, if the horizontal length of the slope including small benches and terraces is within the buffer for that wetland class; or~~
  - ~~b. A twenty-five (25) foot buffer beyond the minimum buffer required for the wetland class involved if the horizontal length of the slope including small benches and terraces extends beyond the buffer for that wetland class;~~

**A. Buffers Required.** A buffer shall be established adjacent to designated wetland areas. The purpose of the buffer area shall be to protect the integrity, functions and values of the wetland area. Buffer widths shall be appropriate for the sensitivity of the wetland and for the risks associated with land use development.

**B. Standard Buffers Comply With BAS.** The following standard buffers have been established in accordance with the best available science (codified at WAC 365-195-900 through 925). They are based on the category of wetland and the habitat score as determined by a qualified wetland professional.

### Standard Wetland Buffers

The following table specifies standard buffers, which may be modified pursuant to subsections E through I of this section

Wetland Category	Habitat Score			
	3 - 4	5	6 - 7	8 - 9
	Buffer Width in Feet			
Category I	75	105	165	225
Category II	75	105	165	225
Category III	60	105	165	225
Category IV	40			

**C. Impact Minimization Measures Required.** The use of the standard buffer widths requires the implementation of the measures in the following table, where applicable, to minimize the impacts of the adjacent land uses. Activities listed under "Examples of Activities That Cause Disturbances" include but are not limited to those listed. If an applicant chooses not to apply those measures, then a 33% increase in the width of all buffers is required. For example, a 75-foot buffer with the measures implemented would increase to a 100-foot buffer without them.

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Wetland Impact Minimization Measures

<u>Disturbance</u>	<u>Examples of Activities and Uses That Cause Disturbances</u>	<u>Required Measures to Minimize Impacts</u>
<u>Lights</u>	<ul style="list-style-type: none"> <li>• <u>Parking lots</u></li> <li>• <u>Warehouses</u></li> <li>• <u>Industrial</u></li> <li>• <u>Multi-family residential</u></li> </ul>	<ul style="list-style-type: none"> <li>• <u>Direct lights away from wetland</u></li> </ul>
<u>Noise in excess of limitations as set forth in SMC 15.460.020</u>	<ul style="list-style-type: none"> <li>• <u>Industrial</u></li> <li>• <u>Parking lots</u></li> <li>• <u>Multi-family residential</u></li> </ul>	<ul style="list-style-type: none"> <li>• <u>Locate activity that generates noise away from wetland</u></li> </ul>
<u>Toxic Runoff</u>	<ul style="list-style-type: none"> <li>• <u>Parking lots</u></li> <li>• <u>Roads</u></li> <li>• <u>Industrial</u></li> <li>• <u>Residential</u></li> <li>• <u>Pesticide application</u></li> <li>• <u>Landscaping</u></li> </ul>	<ul style="list-style-type: none"> <li>• <u>Route all new, untreated runoff away from wetland while ensuring wetland is not dewatered</u></li> <li>• <u>Establish covenants limiting use of pesticides within 150 ft of wetland</u></li> <li>• <u>Apply integrated pest management*</u></li> </ul>
<u>Stormwater Runoff</u>	<ul style="list-style-type: none"> <li>• <u>Roads</u></li> <li>• <u>Driveways</u></li> <li>• <u>Parking Lots</u></li> </ul>	<ul style="list-style-type: none"> <li>• <u>Retrofit stormwater detention and treatment for roads and existing adjacent development</u></li> <li>• <u>Prevent channelized flow from lawns that directly enters the buffer</u></li> <li>• <u>Use LID BMPs</u></li> </ul>
<u>Changes in water regime</u>	<ul style="list-style-type: none"> <li>• <u>Impervious Surfaces</u></li> <li>• <u>Lawns</u></li> <li>• <u>Tilling</u></li> </ul>	<ul style="list-style-type: none"> <li>• <u>Infiltrate or treat, detain, and disperse into buffer new runoff from impervious surfaces and new lawns</u></li> </ul>
<u>Pets and human disturbance</u>	<ul style="list-style-type: none"> <li>• <u>Single family residential</u></li> <li>• <u>Multifamily residential</u></li> <li>• <u>Leash free dog park</u></li> </ul>	<ul style="list-style-type: none"> <li>• <u>Use privacy fencing OR plant dense vegetation to delineate buffer edge and to discourage disturbance using vegetation appropriate for the regional ecology</u></li> <li>• <u>Place wetland and its buffer in a separate tract or protect with a conservation easement</u></li> </ul>
<u>Dust</u>	<ul style="list-style-type: none"> <li>• <u>Excavation</u></li> <li>• <u>Construction</u></li> </ul>	<ul style="list-style-type: none"> <li>• <u>Use best management practices to control dust</u></li> </ul>

\* Integrated pest management is defined as the careful consideration of all available pest control techniques and subsequent integration of appropriate measures that discourage the development of pest populations and keep pesticides and other



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interventions to levels that reduce or minimize risks to human health and the environment.

**D. Vegetated Buffer Assumption.** The buffer widths assume that the buffer is vegetated with a native plant community appropriate for the regional ecology. If the existing buffer is sparsely vegetated, or vegetated with invasive species that do not perform needed functions, the buffer shall either be planted to create the appropriate plant community or widened to ensure that functions and values of the buffer are adequately provided.

**~~C-E~~ Increased Buffers.** Increased buffer widths ~~may~~ shall be required by the City on a case-by-case basis, when necessary to protect wetlands functions and values. This determination shall be supported by a Critical Area Report or other appropriate documentation showing that it is reasonably related to protection of the functions and values of the wetland. Provisions for additional buffer widths shall be contained in administrative rules promulgated pursuant to this chapter including, but not limited to, provisions pertaining to critical drainage areas, location of hazardous substances, critical fish and wildlife habitats, landslide or erosion hazard areas contiguous to wetlands, groundwater recharge and discharge and the location of trail or utility corridors, and or when:

1. The buffer is within twenty-five (25) feet of the top or toe of a slope that is greater than thirty percent (30%); or
2. The slope is susceptible to erosion and standard best management practices (BMPs) and erosion-control measures will not prevent adverse impacts to the wetland.

**~~B-F~~ Buffer Width Averaging.** Buffer width averaging may be allowed by the City in accordance with an approved Critical Area Report provided that all of the following criteria are met:

1. ~~if it~~ will not reduce provide additional protection to wetlands or enhance their functions;
2. ~~as long as~~ The total area contained in the buffer after averaging on the development proposal site does not decrease;
3. The buffer at its narrowest point is not less than 75 percent of the standard width; and
4. The Critical Area Report shall describe the current functions and values of the wetland and its buffer, and the measures that will be taken to ensure that there is no loss of wetland function due to averaging.

**G. Reduced Buffer Allowance.** Reduced buffers may be allowed, with enhancements, in accordance with an approved Critical Area Report provided:

1. The existing condition of the buffer is degraded, and

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3. Additional protection to the wetland is provided through the implementation of a buffer enhancement plan.
4. Buffer enhancement may include, but is not limited to:
  - a. Planting native vegetation that would increase value for fish and wildlife habitat, improve water quality, or provide aesthetic or recreational value;
  - b. Enhancement of wildlife habitat by incorporating structures that are likely to be used by wildlife, including wood duck boxes, bat boxes, nesting platforms, snags, rootwads, stumps, birdhouses, and nesting areas;
  - c. Removing non-native plant species and noxious weeds from the buffer area and replanting the area subject to 4.a. above.

H. **Buffer Reductions Limited.** Buffer reductions under this Section shall be limited to twenty-five percent (25%) of the standard buffer width.

I. **Buffer Exemption.** When a property redevelops, if portions of a buffer width required by this chapter are already developed with legally established physical improvements (e.g., buildings, pavement), those portions of the proposed redevelopment area within the required buffer width are exempt from the buffer requirements of this Chapter.

4.1. **Buffers on Mitigation Sites.** All mitigation sites Any wetland restored, relocated, replaced, or enhanced because of a wetland alteration shall have the minimum buffers consistent with the buffer requirements of this Chapter. Buffers shall be based on for the target or expected category of the wetland category involved, and

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K. **Determination by Wetland Professional.** Alterations to buffer width requirements pursuant to this section shall be determined by a qualified wetland professional using established methodologies and approved federal and state manuals.

~~D. I.~~ **Hazardous Substances Prohibited.** The use of hazardous substances, pesticides, herbicides and fertilizers in the a wetland and or its buffer may be are prohibited except as provided in SMC 15.700.290(D) by the City.

### **15.700.290 Wetlands – Permitted Alterations and Allowed Uses**

Alterations to wetlands and buffers may be allowed only as follows:

- A. If the City determines, based upon its review of special studies a Critical Area Report completed by qualified professionals, that:
  1. The wetland does not serve any of the valuable functions of wetlands identified in this chapter including, but not limited to, biologic and hydrologic functions; or

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2. ~~The~~ proposed development will protect or enhance the wildlife habitat, natural drainage or other valuable functions of the wetland and will be consistent with the purposes of this chapter;

To establish the conditions in this subsection ~~(A)~~, detailed studies may be required as part of the Critical Area Report on habitat value, functions, hydrology, erosion, and/or water quality. Such detailed studies shall include at a minimum:

- a. Specific recommendations for mitigation;
- b. Existing and proposed wetland acreage;
- c. Vegetative, faunal and hydrologic conditions;
- d. Relationship within watershed and to existing waterbodies;
- e. Soil and substrate conditions, topographic elevations;
- f. Existing and proposed adjacent site conditions;
- g. Required wetland buffers;
- h. Property ownership; and
- i. A discussion of ongoing management practices to monitor and maintain wetland functions and habitat value.

The requirements in this subsection ~~(A)(2)~~ of this section may be modified upon written approval of the Director, if the applicant demonstrates that the requirements of this section are met or are otherwise unnecessary.

- B. If a wetland is in a flood hazard area, the applicant shall notify affected communities and native tribes of proposed alterations prior to any alteration and submit evidence of such notification to the Federal Insurance Administration;
- C. ~~There shall be no~~ The introduction of any plant or wildlife which is not indigenous to the City or King County into any wetland or buffer unless authorized by a State or Federal permit or approval is prohibited;
- D. Enhancement of a wetland buffer through the removal of non-native invasive plant species. Removal of invasive plant species shall be restricted to hand removal unless permits from the appropriate regulatory agencies have been obtained for approved biological or chemical treatments. All removed plant material shall be taken away from the site and appropriately disposed of. Plants that appear on the Washington State Noxious Weed Control Board list of

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noxious weeds must be handled and disposed of according to a noxious weed control plan appropriate to that species. Re-vegetation with appropriate native species at natural densities is allowed in conjunction with removal of invasive plant species.

E. Conservation or restoration activities aimed at protecting the soil, water, vegetation, or wildlife.

F. The harvesting of wild crops (e.g., native berries) in a manner that is not injurious to natural reproduction of such crops and provided the harvesting does not require tilling of soil, planting of crops, chemical applications or alteration of the wetland by changing existing topography, water conditions or water sources.

G. Educational and scientific research activities.

H. Normal and routine maintenance and repair of any existing public or private facilities within an existing right-of-way, provided that the maintenance or repair does not expand the footprint of the facility or right-of-way.

1D. Utilities may be allowed in wetland buffers if:

1. The City determines that no practical alternative location is available; and
2. The utility corridor meets any additional requirements set forth in administrative rules including, but not limited to, requirements for installation, replacement of vegetation and maintenance;

1E. Sanitary and storm sewer utility corridors may be allowed in wetland buffers only if:

1. The applicant demonstrates that sewer lines are necessary for gravity flow;
2. The corridor is not located in a wetland or buffer used by species listed as endangered or threatened by the State or Federal government or contain critical or outstanding actual habitat for those species or heron rookeries or raptor nesting trees;
3. The corridor alignment including, but not limited to, any allowed maintenance roads follows a path beyond a distance equal to seventy-five percent (75%) of the buffer width from the wetland edge;
4. Corridor construction and maintenance protects the wetland and buffer and is aligned to avoid cutting trees greater than eight (8) inches in diameter as measured four (4) feet above ground level, when possible, and pesticides, herbicides, and hazardous substances are not used;

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5. An additional, contiguous and undisturbed buffer, equal in width to the proposed corridor including any allowed maintenance roads, is provided to protect the wetland;
6. The corridor is revegetated with appropriate vegetation native to the City and King County at preconstruction densities or greater immediately upon completion of construction or as soon thereafter as possible, and the sewer utility ensures that such vegetation survives;
7. Any additional corridor access for maintenance is provided, to the extent possible, at specific points rather than by a parallel road; and
8. The width of any necessary parallel road providing access for maintenance is as small as possible, but not greater than fifteen (15) feet; the road is maintained without the use of herbicides, pesticides or other hazardous substances; and the location of the road is contiguous to the utility corridor on the side away from the wetland;

KF. Joint use of an approved sewer utility corridor by other utilities may be allowed;

LG. The following surface water management activities and facilities may be allowed in wetland buffers only as follows:

1. Surface water discharge to a Class I or II wetland from a detention facility, presettlement pond or other surface water management activity or facility may be allowed if the discharge does not increase the rate of flow, change the plant composition in a forested wetland or decrease the water quality of the wetland;
2. A Class I or II wetland or buffer may be used for a regional retention/detention facility if:
  - a. A public agency and utility exception is granted pursuant to SMC 15.700.060, Exceptions;
  - b. Constructed in accordance with the requirements of the Surface Water Design Manual;
  - c. The use will not alter the rating or the factors used in rating the wetland;
  - d. The proposal is in compliance with the latest adopted findings of the Puget Sound Wetlands Research Project; and
  - e. There are no significant adverse impacts to the wetland;

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3. A Class III wetland or buffer which has as its major function the storage of water may be used, expanded or reconstructed as a regional retention/detention facility if requirements of the Surface Water Design Manual are met; and
4. Use of a wetland buffer for a surface water management activity or facility, other than a retention/detention facility, such as an energy dissipater and associated pipes, may be allowed only if the applicant demonstrates, to the satisfaction of the City, that:
  - a. No other practical alternative exists; and
  - b. The functions and values of the buffer or the wetland are not adversely affected;

MH. Wetlands can be used for retention/detention facilities other than for regional facilities;

NF. Passive recreation facilities designed and in accordance with an approved critical area report, including: ~~Public and private trails may be allowed in wetland buffers only upon adoption of administrative rules consistent with the following:~~

1. Walkways and trails, provided that those pathways are limited to minor crossings having no adverse impact on water quality. They should be generally parallel to the perimeter of the wetland, located only in the outer twenty-five percent (25%) of the wetland buffer area, and located to avoid removal of significant trees. The trail surface shall should not be made of impervious materials, not more than five (5) feet in width for pedestrian use only, except that public, multi-purpose trails may be made of impervious materials if they meet all other requirements including water quality; and
2. Wildlife viewing structures ~~Buffers shall be expanded, where possible, equal to the width of the trail corridor including disturbed areas;~~

OJ. A dock, pier, moorage, float or launch facility may be allowed, subject to the provisions of Shorelines Management Act, if:

1. The existing and zoned density around the wetland is three (3) dwelling units or more;
2. At least seventy-five percent (75%) of the lots around the wetland have been built upon and no significant buffer or wetland vegetation remains on these lots; and

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3. Open water is a significant component of the wetland;

PK. Alterations to isolated wetlands may be allowed only as follows:

1. On sites less than twenty (20) acres in size, one (1) isolated wetland may be altered by relocating its functions into a new wetland on the site pursuant to an approved mitigation plan;
2. On sites of less than twenty (20) acres in size, up to three (3) isolated wetlands may be altered by combining their functions into one (1) or more replacement wetland on the site pursuant to an approved mitigation plan; and
3. Whenever an isolated wetland is altered pursuant to this subsection, the replacement wetland shall include enhancement for wildlife habitat;

QL. One (1) additional agricultural building or associated residence may be allowed within the wetland buffer on a grazed meadow if all hydrologic storage is replaced on the site;

R. Repair and maintenance of non-conforming uses or structures, where legally established within the buffer, provided they do not increase the degree of nonconformity;

SM. Subject to a clearing and grading permit issued pursuant to Chapter 15.445 Landscaping and Tree Retention SMC and other City Codes, the cutting of up to one (1) cord of firewood may be permitted in buffers of five (5) acres or larger in any year if the overall function of the buffer is not adversely affected. Removal of brush may also be permitted for the purpose of enhancing tree growth if the area of removal is limited to the diameter of the tree canopy at the time of planting;

TN. Wetland road crossings may be allowed if:

1. The City determines that no alternative access is practical;
2. All crossings minimize impact to the wetland and provide mitigation for unavoidable impacts through restoration, enhancement or replacement of disturbed areas;
3. Crossings do not change the overall wetland hydrology;
4. Crossings do not diminish the flood storage capacity of the wetland; and
5. All crossings are constructed during summer low water periods.

**15.700.300 Wetlands – Alteration of Wetlands Historically and Continuously Used for Agricultural Purposes**

Class II and III wetlands that have been used for agricultural purposes for a minimum of fifty (50) continuous years may be altered subject to the following minimum requirements:

- A. The applicant/property owner can provide evidence that the wetland has been used for agricultural use continuously for fifty (50) years. This evidence, at a minimum, shall include aerial photographs of the site at the beginning of the fifty (50) year span of use. Aerial photographs of the site over the span of the use of the wetland for agricultural uses to the present shall be provided. At no time shall there be more than ten (10) years between the chronology of the photographs;
- B. If an agricultural wetland is located solely on one (1) parcel of property, no more than twenty-five percent (25%) of the wetland may be filled;
- C. If the altered wetland is located on more than one (1) property, no more than twenty-five percent (25%) of the entire wetland may be filled. The remainder of the wetland shall be enhanced as approved by the City provided it can be shown by a qualified ~~wetlands biologist~~ wetlands biologist professional, approved by the City that:
  1. The enhancement of the remaining wetland shall provide the same or better hydrologic or biologic functions as the class of wetland identified in the wetland study for the site;
  2. If the altered wetland is located on more than one property, the entire altered wetland shall be identified; and
  3. Any altered wetlands located in a flood hazard area shall conform with SMC 15.700.140 , Vegetation Management Plan through 15.700.240, Flood Hazard Area – Certification by an Engineer or Surveyor; and
- D. For altered wetlands that are located on more than one property, development rights may be transferred from one owner to the other for development within the altered wetland. This shall be done by a nonrevocable contract, as approved by the City. The transfer of property rights shall run with the land. In no case shall the transfer of development rights allow more than .99 acres of fill within an altered wetland.



**15.700.300310 Wetlands – Mitigation Requirements**

A. Requirements for Compensatory Mitigation:

1. Compensatory mitigation for alterations to wetlands shall be used only
  - a. When impacts cannot be addressed by steps 1 through 4 of SMC 15.700.120(A);
  - b. And shall not apply to allowed alterations pursuant to SMC 15.700.285(F) (G), or (I);
  - c. And shall achieve equivalent or greater biological functions.
2. Compensatory mitigation plans shall be consistent with this Chapter and *Wetland Mitigation in Washington State, Part 2: Developing Mitigation Plans, Version 1*, (Ecology Publication #06-06-01 1b) or as amended, and *Selecting Wetland Mitigation Sites Using a Watershed Approach (Western Washington)* (Publication #09-06-32, Olympia, WA, December 2009), or other best available science as recommended by Dept. of Ecology;
3. A performance bond or other approved financial surety is required before any project permits are issued. The purpose of the financial surety is to hold an applicant accountable for implementing the mitigation and monitoring plans. The release of financial surety is contingent on satisfactory completion by the applicant of the proposed construction mitigation and monitoring plans.
4. Mitigation ratios shall be consistent with Subsection G of this Section.

B. Compensating for Lost or Affected Functions.

Compensatory mitigation shall address the functions affected by the proposed project, with an intention to achieve functional equivalency or improvement of functions. The goal shall be for the compensatory mitigation to provide similar wetland functions as those lost, except when either:

1. The lost wetland provides minimal functions, and the proposed compensatory mitigation action(s) will provide equal or greater functions or will provide functions shown to be limiting within a watershed through a formal Washington state watershed assessment plan or protocol; or
2. Out of kind replacement will best meet formally identified regional goals, such as replacement of historically diminished wetland types.

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### C. Preference of Mitigation Actions

Mitigation for lost or diminished wetland and buffer functions shall rely on the types below in the following order of preference:

1. Restoration (re-establishment and rehabilitation) of wetlands
  - a. The goal of re-establishment is returning natural or historic functions to a former wetland.
  - b. The goal of rehabilitation is repairing natural or historic functions of a degraded wetland.

2. Creation (establishment) wetlands on disturbed upland sites such as those with vegetative cover consisting primarily of non-native species or noxious weeds.

This should be attempted only when there is an adequate source of water and it can be shown that the surface and subsurface hydrologic regime is conducive to the wetland community that is anticipated in the design.

3. Enhancement of significantly degraded wetlands in combination with restoration or creation.

Enhancement should be part of a mitigation package that includes replacing the altered area and meeting appropriate ratio requirements. Applicants proposing to enhance wetlands or associated buffers shall demonstrate:

- a. How the proposed enhancement will increase the wetland's/buffer's functions and values;
  - b. How this increase in function will adequately compensate for the impacts; and
  - c. How all other existing wetland functions and values at the mitigation site will be protected.
4. Preservation of high-quality, at risk wetlands as compensation is generally acceptable when done in combination with restoration, creation, or enhancement, provided that a minimum of 1:1 acreage replacement is provided by re-establishment or creation. Ratios for preservation in combination with other forms of mitigation generally range from 10:1 to 20:1, as determined on a case-by-case basis, depending on the quality of the wetlands being altered and the quality of the wetlands being preserved.

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### D. Location of Compensatory Mitigation.

Mitigation actions shall be conducted within the same sub-drainage basin and on the site of the alteration except when all of the following apply:

1. There are no reasonable on-site or in sub-drainage basin opportunities, or on-site and in subdrainage basin opportunities do not have a high likelihood of success due to development pressures, adjacent land uses, or on-site buffers or connectivity are inadequate;
2. On site mitigation would require elimination of high quality upland habitat;
3. Off-site mitigation has a greater likelihood of providing equal or improved wetland functions; and
4. Off site locations shall be in the same sub-drainage basin and in the same Water Resource Inventory Area (WRIA) unless:
  - a. Established watershed goals for water quality, flood storage or conveyance, habitat, or other wetland functions and values have been established and strongly justify location of mitigation at another site; or
  - b. Credits from a state-certified wetland mitigation bank are used as compensation, and the use of credits is consistent with the terms of the certified bank instrument;
  - c. If compensatory wetland or wetland buffer mitigation is proposed off site, a signed statement of consent is required from owners of all affected properties. This statement shall be submitted to the city and a Notice recorded with the King County Recorder prior to approval of a compensatory mitigation plan.

### E. Timing of Compensatory Mitigation

Mitigation shall be completed immediately following disturbance and prior to use or occupancy of the activity or development causing the wetland alteration.  
Construction of mitigation projects shall be timed to reduce impacts to existing wildlife and flora.

### F. Wetland Mitigation Ratios:

In the following table the first number indicates the acreage of replacement wetlands and the second number indicates the acreage of wetlands altered.

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<u>Category and Type of Wetland</u>	<u>Creation or Re-establishment</u>	<u>Rehabilitation</u>	<u>Enhancement</u>
<u>Category I: Mature Forested</u>	<u>6:1</u>	<u>12:1</u>	<u>24:1</u>
<u>Category I: Based on Functions</u>	<u>4:1</u>	<u>8:1</u>	<u>16:1</u>
<u>Category II</u>	<u>3:1</u>	<u>6:1</u>	<u>12:1</u>
<u>Category III</u>	<u>2:1</u>	<u>4:1</u>	<u>8:1</u>
<u>Category IV</u>	<u>1.5:1</u>	<u>3:1</u>	<u>6:1</u>

G. Illegal Alteration

1. When a wetland or its buffer has been altered in violation of this chapter, all ongoing development work on the site shall stop and the critical area shall be restored. The City shall have the authority to issue a "stop work" order, pursuant to SMC 1.15, to cease all ongoing development work and order restoration, rehabilitation, or replacement measures at the owner's or other responsible party's expense to compensate for violating provisions of this Chapter.

2.A Restoration shall be required when a wetland or its buffer is altered in violation of law or without any specific permission or approval by the City. The following minimum requirements shall be met for the restoration of a wetland:

- 4a. The original wetland structure, functions and values of the wetland configuration shall be restored replicated including hydrologic function, water quality and habitat functions; its depth, width, length and gradient at the original location;
- 2b. The original soil type and configuration shall be restored replicated;
- 3c. The wetland edge and buffer configuration shall be restored to its original condition; and
- 4d. The wetland, edge and buffer shall be replanted with vegetation native to the regional ecology City and King County which replicates the original vegetation in species, sizes and densities; and
- 5. The original wetland functions shall be restored including, but not limited to, hydrologic and biologic functions;

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3B. The requirements in subsection ~~2 (A)~~ may be modified if the applicant demonstrates that greater wetland functions can otherwise be obtained;

~~C. — Enhancement shall be required when a wetland or buffer will be altered pursuant to a development proposal. Minimum requirements for enhancement shall be established in the SEPA process but must maintain or improve the wetland's biologic and/or hydrologic functions;~~

~~D. — Replacement may be allowed when a wetland or buffer is altered pursuant to an approved development proposal if no reasonable opportunities exist for enhancement;~~

~~E. — All alterations of wetlands shall be replaced or enhanced on the site using the following formulas: Class I and II wetlands on a two (2) to one (1) basis and Class III on a one (1) to one (1) basis with equivalent or greater biologic functions including, but not limited to, habitat functions and with equivalent hydrologic functions, including, but not limited to, storage capacity;~~

~~F. — Replacement or enhancement off the site may be allowed if the applicant demonstrates to the satisfaction of the City that the off-site location is in the same drainage sub-basin as the original wetland and that greater biologic and hydrologic functions will be achieved. The formulas in subsection (E) shall apply to replacement and enhancement off the site; and~~

~~G. — Surface water management or flood control alterations including, but not limited to, wetponds shall constitute replacement or enhancement unless other functions are simultaneously improved.~~

### ~~15.700.320 Wetlands — Limited Exemption~~

~~Isolated wetlands less than one thousand (1,000) square feet may be exempted from the provisions of SMC 15.700.280, Wetlands — Development Standards through 15.700.310, Wetlands — Mitigation Requirements and may be altered by filling or dredging if the City determines that the cumulative impacts do not unduly counteract the purposes of this chapter and are mitigated pursuant to an approved mitigation plan.~~

### **15.700.330 Streams — Development Standards**

A development proposal on a site containing a stream shall meet the following requirements.

- A. The following minimum buffers shall be established from the ordinary high water mark (OHWM) or from the top of the bank if the OHWM cannot be identified:
  1. A Class 1 stream shall have a one hundred (100) foot buffer;
  2. A Class 2 stream used by salmonids shall have a one hundred (100) foot buffer;
  3. A Class 2 stream not used by salmonids shall have a fifty (50) foot buffer;

4. A Class 3 stream shall have a twenty-five (25) foot buffer;
  5. Any stream restored, relocated, replaced or enhanced because of a stream alteration shall have the minimum buffer required for the stream class involved;
  6. Any stream with an OHWM within twenty-five (25) feet of the toe of a slope thirty percent (30%) or steeper, but less than forty percent (40%), shall have:
    - a. The minimum buffer required for the stream class involved or a twenty-five (25) foot buffer beyond the top of the slope, whichever is greater, if the horizontal length of the slope including small benches and terraces is within the buffer for that stream class; or
    - b. A twenty-five (25) foot buffer beyond the minimum buffer required for the stream class involved if the horizontal length of the slope including small benches and terraces extends beyond the buffer for that stream class; and
  7. Any stream adjoined by a riparian wetland or other contiguous ~~sensitive~~ critical area shall have the buffer required for the stream class involved or the buffer which applies to the wetland or other ~~sensitive-critical~~ critical area, whichever is greater;
- B. Buffer width averaging may be allowed by the City if it will provide additional protection, as long as the total area contained in the buffer on the development proposal site does not decrease; and
- C. The use of hazardous substances, pesticides and fertilizers in the stream corridor and its buffer is prohibited unless specifically allowed by the City.

#### **15.700.340 Streams – Permitted Alterations**

Alterations to streams and buffers may be allowed only as follows:

- A. Alterations may only be permitted if based upon a special study;
- B. The applicant shall notify affected communities and native tribes of proposed alteration(s) prior to any alteration if the stream is in a flood hazard area. The applicant shall submit evidence of such notification to the Federal Insurance Administration;
- C. There shall be no introduction of any plant or wildlife which is not indigenous to the City or King County into any stream or buffer unless authorized by a State or Federal permit or approval by the City;

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- D. Utilities may be allowed in stream buffers if:
1. No practical alternative location is available;
  2. The utility corridor meets any additional requirements set forth in administrative rules including, but not limited to, requirements for installation, replacement of vegetation and maintenance;
  3. The requirements for sewer utility corridors (SMC 15.700.290, Wetlands – Permitted Alterations) shall also apply to streams; and
  4. Joint use of an approved sewer utility corridor by other utilities may be allowed;
- E. The following surface water management activities and facilities may be allowed in stream buffers as follows:
1. Surface water discharge to a stream from a detention facility, presettlement pond or other surface water management activity or facility may be allowed if the discharge is in compliance with the Surface Water Design Manual;
  2. A Class 2 stream or buffer may be used for a regional retention/detention facility if:
    - a. A public agency and utility exception is granted pursuant to SMC 15.700.060, Exceptions;
    - b. Designed in accordance with the requirements of the Surface Water Design Manual;
    - c. The use will not alter the rating or the factors used in rating the stream;
    - d. There are no significant adverse impacts to the stream; and
  3. A Class 3 stream or buffer may be used as a regional retention/detention facility if the alteration will have no lasting adverse impact on any stream and if designed in accordance with the requirements of the Surface Water Design Manual;
- F. Public and private trails may be allowed in the stream buffers only upon adoption of administrative rules consistent with the following:

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1. The trail surface shall not be made of impervious materials, except that public multi-purpose trails may be made of impervious materials if they meet all other requirements including water quality; and
2. Buffers shall be expanded, where possible, equal to the width of the trail corridor including disturbed areas;

G. Stream crossings may be allowed if:

1. All road crossings use bridges or other construction techniques which do not disturb the stream bed or bank, except that bottomless culverts or other appropriate methods demonstrated to provide fisheries protection may be used for Class 2 and 3 streams if the applicant demonstrates that such methods and their implementation will pose no harm to the stream or inhibit migration of fish;
2. All crossings are constructed during the summer low flow and are timed to avoid stream disturbance during periods when use is critical to salmonids;
3. Crossings do not occur over salmonid spawning areas unless the City determines that no other possible crossing site exists;
4. Bridge piers or abutments are not placed within the FEMA floodway or the ordinary high water mark;
5. Crossings do not diminish the flood-carrying capacity of the stream;
6. Underground utility crossings are laterally drilled and located at a depth of four (4) feet below the maximum depth of the scour for the base flood predicted by a civil engineer licensed by the State of Washington; and
7. Crossings are minimized and serve multiple purposes and properties whenever possible;

H. Stream relocations may be allowed only for:

1. Class 2 streams as part of a public road project for which a public agency and utility exception is granted pursuant to SMC 15.700.060, Exceptions; and
2. Class 3 streams for the purpose of enhancing resources in the stream if:
  - a. Appropriate floodplain protection measures are used; and
  - b. The relocation occurs on the site, except that relocation off the site may be allowed if the applicant demonstrates that any on-site



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relocation is impractical, the applicant provides all necessary easements and waivers from affected property owners and the off-site location is in the same drainage sub-basin as the original stream;

- I. For any relocation allowed by this section, the applicant shall demonstrate, based on information provided by a civil engineer and a qualified biologist, that:
  - 1. The equivalent base flood storage volume and function will be maintained;
  - 2. There will be no adverse impact to local groundwater;
  - 3. There will be no increase in velocity;
  - 4. There will be no interbasin transfer of water;
  - 5. There will be no increase in the sediment load;
  - 6. Requirements set out in the mitigation plan are met;
  - 7. The relocation conforms to other applicable laws; and
  - 8. All work will be carried out under the direct supervision of a qualified biologist;
- J. A stream channel may be stabilized if:
  - 1. Movement of the stream channel threatens existing residential or commercial structures, public facilities or improvements, unique natural resources or the only existing access to property; and
  - 2. The stabilization is done in compliance with the requirements of SMC 15.700.140, Vegetation Management Plan through 15.700.240, Flood Hazard Areas – Certification by an Engineer or Surveyor and administrative rules promulgated pursuant to this chapter;
- K. Stream enhancement not associated with any other development proposal may be allowed if accomplished according to a plan for its design, implementation, maintenance and monitoring prepared by a civil engineer and a qualified biologist and carried out under the direct supervision of a qualified biologist pursuant to provisions contained in administrative rules;
- L. A minor stream restoration project or fish habitat enhancement may be allowed if:
  - 1. The restoration is accomplished by a public agency with a mandate to do such work;

2. The restoration is unassociated with mitigation of a specific development proposal;
  3. The restoration does not cost more than twenty-five thousand dollars (\$25,000);
  4. The restoration is limited to placement of rock weirs, log controls, spawning gravel and other specific salmonid habitat improvements;
  5. The restoration only involves the use of hand labor and light equipment; and
  6. The restoration is performed under the direct supervision of a qualified biologist;
- M. Roadside and agricultural drainage ditches which carry streams with salmonids may be maintained through use of best management practices developed in consultation with relevant County, State, and Federal agencies. These practices shall be adopted as administrative rules; and
- N. Subject to a clearing and grading permit issued pursuant to tree retention requirements in SMC 15.445.140 through 15.445.148, the cutting of up to one (1) cord of firewood may be permitted in buffers of five (5) acres or larger in any year if the overall function of the buffer is not adversely affected. Removal of brush may also be permitted for the purpose of enhancing tree growth if the area of removal is limited to the diameter of the tree canopy at the time of planting.

**15.700.350 Streams – Mitigation Requirements**

- A. Restoration shall be required when a stream or its buffer is altered in violation of law or without any specific permission or approval by the City. A mitigation plan for the restoration shall demonstrate that:
1. The stream has been degraded and will not be further degraded by the restoration activity;
  2. The restoration will reliably and demonstrably improve the water quality and fish and wildlife habitat of the stream;
  3. The restoration will have no lasting, significant, adverse impact on any stream functions; and
  4. The restoration will assist in stabilizing the stream channel;

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- B. The following minimum requirements shall be met for the restoration of a stream:
1. All work shall be carried out under the direct supervision of a qualified biologist;
  2. Basin analysis shall be performed to determine hydrologic conditions;
  3. The natural channel dimensions shall be replicated including its depth, width, length and gradient at the original location, and the original horizontal alignment (meander lengths) shall be replaced;
  4. The bottom shall be restored with identical or similar materials;
  5. The bank and buffer configuration shall be restored to its original condition;
  6. The channel, bank and buffer areas shall be replanted with vegetation native to the City and King County which replicates the original vegetation in species, sizes and densities; and
  7. The original biologic functions of the stream shall be recreated;
- C. The requirements in subsection (B) may be modified if the applicant demonstrates to the satisfaction of the City that a greater biological function can otherwise be obtained;
- D. Replacement or enhancement shall be required when a stream or buffer is altered pursuant to an approved development proposal. There shall be no net loss of stream functions on a development proposal site and no impact on stream functions above or below the site due to approved alterations;
- E. The requirements which apply to the restoration of streams in subsection (B) shall also apply to the relocation of streams, unless the applicant demonstrates to the satisfaction of the City that a greater biological function can be obtained by modifying these requirements;
- F. Replacement or enhancement for approved stream alterations shall be accomplished in streams and on the site unless the applicant demonstrates to the satisfaction of the City:
1. Enhancement or replacement on the site is not possible;
  2. The off-site location is in the same drainage sub-basin as the original stream; and

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3. Greater biological and hydrological functions will be achieved; and

G. Surface water management or flood control alterations shall not be considered "enhancement" unless other functions are simultaneously improved.

**15.700.360 ~~Critical Recharging Areas~~ Aquifer Recharge Areas For Aquifers Used For Potable Water and Wellhead Protection Areas and General Groundwater Resources**

The aquifer identified as Q(A)c by the US Geological Survey is considered the major aquifer underlying SeaTac and other cities west of the Green River Valley (the "Des Moines Upland"), and is generally encountered between 100 ft. above and 100 ft. below sea level. A deeper aquifer identified as Q(B)c is generally encountered between sea level and 200 ft. below sea level. These aquifers are the source of water for the wells in SeaTac operated by the Highline Water District and Seattle Public Utilities.

A. Purpose and Intent. It is the purpose and intent of the regulations in this Section to protect from contamination the areas around wellheads serving as sources of potable water, as identified by the water districts operating those wells; to limit activities that may adversely effect groundwater resources more generally; and to prevent contaminants from entering the aquifers underlying the city.

B. Application of Regulations in the Section. This section regulates uses and/or activities in the following areas:

1. Wellhead Protection Areas (WHPA) as delineated on the Wellhead Protection Areas Map (see Map 9.2 in the SeaTac Comprehensive Plan's Environment Element).

The wellhead protection areas delineated on the referenced map were established by the water districts that operate these wells; Highline Water District and Seattle Public Utilities.

The Wellhead Protection Areas map is intended as a guide for the city, project applicants and/or property owners and may be updated as new information becomes available.

2. All other areas of the city.

C. Prohibited Uses

The following activities and uses are prohibited in Wellhead Protection Areas and all other areas of the city

1. Landfills. Landfills, including hazardous or dangerous waste, municipal solid waste, special waste, wood waste, and inert and demolition landfills

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2. **Underground Injection Wells.** All underground injection wells as defined in Chapter 173-218 WAC with the exception of those listed in subsections a. through i. below. All underground injection wells shall comply with the requirements of WAC 173-218.

- a. **Surface water management facilities pursuant to the Surface and Stormwater Management Code (SMC 12.10)**
- b. **Drainage wells such as those used to drain storm water such as a French drain or infiltration trench containing perforated pipe**
- c. **Heat pump or cooling water return flows wells**
- d. **Aquifer recharge wells**
- e. **Septic systems serving an individual residential property, or as otherwise approved by Public Health-Seattle and King County**
- f. **Injection wells used to control flooding of residential basements or as part of a reclaimed water project as allowed under a permit.**
- g. **Injection wells used for remediation wells receiving fluids intended to clean up, treat or prevent subsurface contamination**
- h. **Injection wells used as part of a reclaimed water project as allowed under a permit**
- i. **Injection wells used to inject carbon dioxide for geologic sequestration.**

3. **Mining**

- a. **Metals and hard rock mining; and**
- b. **Sand and gravel mining;**

4. **Wood Treatment Facilities.** Wood treatment facilities that allow any portion of the treatment process to occur over permeable surfaces (both natural and manmade);

5. **Dry Cleaning Establishments.** Dry cleaning establishments using the solvent perchloroethylene.

6. **Storage, Processing, or Disposal of Radioactive Substances.** Facilities that store, process, or dispose of radioactive substances; and

**7. Other Prohibited Uses or Activities**

- a. Activities that would significantly reduce the recharge to aquifers currently or potentially used as a potable water source;
- b. Activities that would significantly reduce the recharge to aquifers that are a source of significant baseflow to a regulated stream.

**D. General Performance Standards:**

1. The proposed activity must be designed and constructed to employ all known, available and reasonable (AKART) methods of prevention, control and treatment of pollutants associated with a discharge;
2. The proposed activity must comply with the water source protection requirements and recommendations of the U.S. Environmental Protection Agency, Washington State Department of Health, and Public Health-Seattle and King County;
3. The proposed activity must be designed and constructed in accordance with the requirements of the Surface and Stormwater Management Code (SMC 12.10), the Clearing and Grading Code (SMC 13.190) and the International Building Code (SMC 13.110);
4. If applicable, the proposed activity must comply with the requirements of the International Fire Code (SMC 13.150).

**E. Development Within a Wellhead Protection Area:**

1. Any proposed non-residential development located in a Wellhead Protection Area shall submit a Hazardous Materials Inventory Sheet (HMIS) with any permit, land use, or business license application. Ongoing operation and maintenance activities of public wells by public water providers are exempt from these requirements.
2. The city will review the HMIS along with the permit, land use, or business license application to determine whether hazardous substances will be used, stored, transported or disposed of in connection with the proposed activity. The city shall make the following determinations and apply the appropriate measures:
  - a. No hazardous substances are involved, or;
  - b. Hazardous substances are involved; however, existing laws or regulations adequately mitigate any potential impact, and documentation is provided to demonstrate compliance, or;

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- c. Hazardous substances are involved and the proposal has the potential to significantly impact wellhead protection areas or other groundwater resources. The city may require a Critical Area Report in order to determine the potential impacts of contamination on aquifers or other groundwater resources.
- 3. The Critical Area Report shall be prepared by a qualified professional, as specified in SMC 15.700.015, "Qualified Professional," and shall include the following site and proposal-related information:
  - a. Available information regarding geologic and hydrogeologic characteristics of the site including the permeability of the unsaturated zone;
  - b. Ground water depth, flow direction, and gradient based on available information;
  - c. Currently available data on wells and springs within 1,300 feet of the project site;
  - d. Location of other critical areas, including surface waters, within 1,300 feet of the project site;
  - e. Available historic water quality data for the area to be affected by the proposed activity; and
  - f. Best management practices proposed to be utilized.
  - g. Upon receipt of the Critical Area Report the department shall forward a copy of the Critical Area Report to the appropriate Water District for review and comment.

### **F. Performance Standards, Specific: Applicable to specific uses**

- 1. **Storage Tanks.** All storage tanks must comply the terms of subsection D, above, and either a or b, below:
  - a. **Underground Tanks.** All new underground storage facilities proposed for use in the storage of hazardous substances or hazardous wastes shall be designed and constructed so as to:
    - i. Prevent releases due to corrosion or structural failure for the operational life of the tank;
    - ii. Be protected against corrosion, constructed of noncorrosive material, steel clad with a noncorrosive material, or designed to

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include a secondary containment system to prevent the release or threatened release of any stored substances; and

iii. Use material in the construction or lining of the tank that is compatible with the substance to be stored.

b. **Above Ground Tanks.** All new above ground storage facilities proposed for use in the storage of hazardous substances or hazardous wastes shall be designed and constructed so as to:

i. Not allow the release of a hazardous substance to the ground, ground waters, or surface waters;

ii. Have a primary containment area enclosing or underlying the tank or part thereof; and

iii. A secondary containment system either built into the tank structure or a dike system built outside the tank for all tanks.

**2. Vehicle Repair, and Servicing.**

For the purposes of this subsection the term "vehicle repair and servicing" shall include, as defined in SMC 15.105, Automotive Service Center, Fueling/Service Station, Vehicle Repair, Small, and Vehicle Repair, Large.

a. Vehicle repair and servicing must be conducted over impermeable pads and within a covered structure capable of withstanding normally expected weather conditions. Chemicals used in the process of vehicle repair and servicing must be stored in a manner that protects them from weather and contains leaks should one occur.

b. No dry wells shall be allowed on sites used for vehicle repair and servicing. Dry wells existing on the site prior to facility establishment shall be abandoned using techniques approved by the state Department of Ecology prior to commencement of the proposed activity.

**3. Residential Use of Pesticides and Nutrients.** Application of household pesticides, herbicides, and fertilizers shall not exceed times and rates specified on the packaging.

**4. Use of Reclaimed Water for Surface Percolation or Direct Recharge.** Water reuse projects for reclaimed water must be in accordance with the adopted water or sewer comprehensive plans that have been approved by the state departments of Ecology and Health.



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- a. Use of reclaimed water for surface percolation must meet the ground water recharge criteria given in Chapter 90.46.080(1) and Chapter 90.46.010(10) RCW. The state Department of Ecology may establish additional discharge limits in accordance with Chapter 90.46.080(2) RCW.
  - b. Direct injection must be in accordance with the standards developed by authority of Chapter 90.46.042 RCW.
5. **State and Federal Regulations.** The uses listed below shall be conditioned as necessary to protect critical aquifer recharge areas in accordance with the applicable state and federal regulations.

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**Statutes, Regulations, and Guidance Pertaining to  
Ground Water Impacting Activities**

<u>Activity</u>	<u>Statute – Regulation - Guidance</u>
<u>Above Ground Storage Tanks</u>	<u>Chapter 173-303-640 WAC</u>
<u>Automobile Washers</u>	<u>Chapter 173-216 WAC, Best Management Practices for Vehicle and Equipment Discharges (Washington Department of Ecology WQ-R-95-56)</u>
<u>Below Ground Storage Tanks</u>	<u>Chapter 173-360 WAC</u>
<u>Chemical Treatment Storage and Disposal Facilities</u>	<u>Chapter 173-303 WAC</u>
<u>Injection Wells</u>	<u>Federal 40 CFR Parts 144 and 146, Chapter 173-218 WAC</u>
<u>Hazardous Waste Generator (Boat Repair Shops, Biological Research Facility, Dry Cleaners, Furniture Stripping, Motor Vehicle Service Garages, Photographic Processing, Printing and Publishing Shops, etc.)</u>	<u>Chapter 173-303 WAC</u>
<u>Junk Yards/Salvage Yards</u>	<u>Chapter 173-304 WAC, Best Management Practices to Prevent Stormwater Pollution at Vehicles Recycler Facilities (Washington State Department of Ecology 94-146)</u>
<u>Oil and Gas Drilling</u>	<u>Chapter 332-12 WAC, Chapter 173-218 WAC</u>
<u>On-Site sewage systems (Large Scale)</u>	<u>Chapter 173-240 WAC</u>
<u>On-Site Sewage Systems (&lt; 14,500 gal/day)</u>	<u>Chapter 246-272A WAC, Local Health Ordinances</u>
<u>Pesticide Storage and Use</u>	<u>Chapter 15.58 RCW, Chapter 17.21 RCW</u>
<u>Sawmills</u>	<u>Chapter 173-303 WAC, Chapter 173-304 WAC, Best Management Practices to Prevent Stormwater Pollution at Log Yards (Washington State Department of Ecology, 95-53)</u>
<u>Solid Waste Handling and Recycling Facilities</u>	<u>Chapter 173-304 WAC</u>
<u>Wastewater Application to Land Surface</u>	<u>Chapter 173-216 WAC, Chapter 173-200 WAC, Washington State Department of Ecology Land Application Guidelines, Best Management Practices for Irrigated Agriculture</u>
<u>Maintain groundwater quality</u>	<u>Chapter 173-200-030 WAC, Washington Antidegradation Policy</u>

A. Purpose. Potable water is an essential life-sustaining element. Once groundwater is contaminated, it is difficult, costly, and sometimes impossible to clean. Preventing contamination is necessary to avoid exorbitant costs, hardships, and potential physical harm to the public. It is the City's intent, through this section, to recognize the importance of aquifers and to acknowledge a responsibility common to all governmental agencies to ensure, as much as possible through each jurisdiction's

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powers, the protection of health, safety and welfare of the public, the continued quantity and quality of groundwater supplies through the regulation of land uses which may contribute contamination that may degrade groundwater quality and/or quantity in recharge areas of vulnerability. The extent of regulation shall be based on the degree of vulnerability of an identified recharge area and the contaminant loading potential of the proposed land use.

B. Where it is determined through special studies or City mapping projects that soil and geologic formation permeability exists such that the presence of a groundwater recharge area is likely, the City Manager, or designee, may require further investigation by the applicant of the existence of recharge areas when the proposed land use involved is considered to be of a type or intensity that has a high contamination potential. Such uses may include, but are not limited to, planned unit developments, waste disposal sites, or agriculture activities.

C. Any additional required special studies shall address, but are not limited to, the following:

1. Depth of groundwater;
2. Aquifer properties such as hydraulic conductivity and gradients;
3. Soil texture, permeability, and contaminant attenuation properties;
4. Characteristics of the vadose zone (the unsaturated top layer of soil and geologic material) including permeability and attenuation properties; or
5. Other relevant factors.

D. Based upon information provided in any required special report or study, the Department of Community and Economic Development shall determine conditions of development which will ensure, to the extent possible, no degradation of groundwater quantity or quality. Such conditions shall be attached to any permit required by the project proposal. (Ord. 11-1002 § 2; Ord. 95-1012 § 1; Ord. 92-1041 § 1)

### 15.700.370 Fish and Wildlife Habitat Conservation Areas

A. Purpose. Fish and wildlife habitat conservation means land management for maintaining species in a wild state in suitable habitats within their natural geographic distribution so that isolated sub-populations are not created. This does not mean maintaining all individuals of all species at all times. It does mean that cooperative and coordinated land use planning is critically important among counties and cities in a region. In some cases, it may be sufficient to assure that a species will usually be found in certain regions across the State. In other cases, it may be necessary to assure protection to each individual species. Protection needs to be species specific and goal-oriented. Fish and wildlife habitat conservation areas include:

1. Areas with which endangered, threatened, and sensitive species, including anadromous fish, have a primary association;
2. Habitats and species of local importance (i.e., herons);

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3. Naturally occurring lakes or ponds under twenty (20) acres and their submerged aquatic beds that provide fish or wildlife habitat;
4. Waters of the State;
5. Lakes, ponds, and streams planted with game fish by a governmental or tribal entity.

"Fish and wildlife habitat conservation areas" does not include such artificial features or constructs as irrigation delivery systems, irrigation infrastructure, irrigation canals, or drainage ditches that lie within the boundaries of and are maintained by a port district or an irrigation district or company.

The provisions of this of this chapter do not apply to any habitat areas which come under the jurisdiction of the Shoreline Management Program.

- B. Fish and wildlife habitat conservation areas may, and probably will, include one (1) or more of other sensitive-critical areas identified in this chapter. The following classification system is based on the presence of one (1) or more of these sensitive-critical areas as well as species identified as endangered, threatened, sensitive, or priority, the area's proximity to developed areas, and the area's existing use.
1. Category 1 habitat is classified as including any wetland or stream or their buffer areas or any area identified as habitat for endangered, threatened, sensitive or priority species by the State Department of Fish and Wildlife (DFWDO) or heron, and which is characterized by agricultural or low density residential use (one (1) unit or less per acre) and which is not within two hundred (200) feet of more intense land uses.
  2. Category 2 habitat is classified as including any wetland or stream or their buffer areas or any area identified as habitat for endangered, threatened, sensitive, or priority species by the DFWDO and which is characterized by residential uses of greater density than one (1) unit per acre or which lies within two hundred (200) feet of more intense land uses.
  3. Category 3 habitat is classified as an area which does not include a wetland or stream or their buffer areas or any area identified as habitat for endangered, threatened, sensitive or priority species by the DFWDO and which is characterized by single-family residential areas immediately adjacent to multifamily or nonresidential land uses.
  4. Category 4 habitat is classified as an area which does not include a wetland or stream or their buffer areas or any area identified as habitat for endangered, threatened, sensitive, or priority species by the DFWDO and which is characterized by nonresidential land uses.

- C. Buffers. For any fish and wildlife habitat conservation areas which include other ~~sensitive-critical~~ areas as identified and regulated in this chapter, the buffer for those ~~sensitive-critical~~ areas shall apply except where species identified by the ~~DFWDOW~~ as endangered, threatened, sensitive, or priority, or where herons are found to have a primary association. If such species are present, the applicant shall provide a ~~critical area report special study~~ identifying such species, their required habitat, and recommend appropriate buffers based on the ~~DFWDOW~~ priority habitat and species management recommendations as well as any other proposed mitigation measures considered appropriate to the protection of said species and habitat.

**RESOLUTION NO. 16-016**

A RESOLUTION of the City Council of the City of SeaTac, Washington, confirming a deferred date for completing an update of this Critical Areas Regulations, Chapter 15.700 of the SeaTac Municipal Code.

**WHEREAS**, the Washington State Growth Management Act (RCW 36.70A) requires that cities provide for the protection of "critical areas," which include wetlands, geologically hazardous areas, etc.; and

**WHEREAS**, RCW 36.70A.130 requires cities to periodically review their comprehensive plans and development regulations and if necessary, revise them to ensure they comply with the Growth Management Act; and

**WHEREAS**, in May 2015, City staff was notified by the Washington State Department of Ecology that portions of its critical area regulations were not consistent with current State law; and

**WHEREAS**, in September 2015, City staff was advised that June 30, 2015 was the statutory deadline to complete its review and that an extension had been granted under the "reasonable progress exception" (RCW 36.70A.130(7)(b)) until June 30, 2016; and

**WHEREAS**, the City Planning Commission has reviewed amendments to the City's Critical Areas Regulations (SMC 15.700) over the course of eight meetings, beginning in January 2016; and

**WHEREAS**, on March 4, 2016, City staff sent a copy of the draft critical areas amendments to the Washington Department of Commerce for "60-day review" as required by RCW 36.70A.106; and

**WHEREAS**, the City Planning Commission conducted a duly noticed public hearing on the proposed amendments on May 3, 2016 and May 17, 2016, after which it issued its recommendation to the City Council; and

**WHEREAS**, the City Council finds there are significant issues with the proposed amendments that need to be given thorough consideration and therefore is unable to meet the June 30, 2016 deadline;

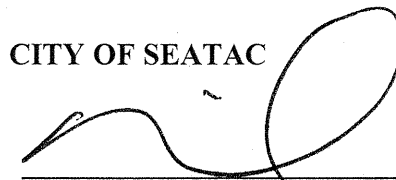
**NOW, THEREFORE, THE CITY COUNCIL OF THE CITY OF SEATAC, WASHINGTON HEREBY RESOLVES as follows:**

Section 1. The City commits to adopting revisions to its Critical Areas Regulations to ensure compliance with State law as required by RCW 36.70A.130, by September 30, 2016.

Section 2. Continued review of the proposed amendments to the Critical Areas Regulations, SMC 15.700, shall be conducted by the City Council's Land Use and Parks Committee. The Committee is directed to render its recommendation to the full Council by September 13, 2016.

**PASSED** this 28<sup>th</sup> day of June, 2016 and signed in authentication thereof on this 28<sup>th</sup> day of June, 2016.

**CITY OF SEATAC**



Michael Siefkes, Mayor

**ATTEST:**

  
Kristina Gregg, City Clerk

Approved as to Form:

Mary Mirante Bartolo  
Mary E. Mirante Bartolo, City Attorney

[Critical Areas Regulations SMC 15.700]



**Review Dates for Proposed Amendments to  
SMC Chapter 15.700, Environmentally Sensitive Areas**

Planning Commission:

11/12/2015, 1/5/2016, 01/19/2016, 02/02/2016, 02/16/2016, 03/01/2016, 03/15/2016,  
04/05/2016, 05/03/2016 (Public Hearing), 05/17/2016.

Council Study Session:

03/22/2016, 04/12/2016, 05/24/2016, 09/13/2016

Land Use and Parks (LUP) Committee

06/09/2016, 06/23/2016, 07/14/2016, 08/11/2016, 08/25/2016

**ORDINANCE NO. 16-1017**

AN ORDINANCE of the City Council of the City of SeaTac, Washington adding a new chapter 7.50 to the SeaTac Municipal Code related to Chronic Nuisance Properties; amending section 5.05.180 of the SeaTac Municipal Code to include business license suspension or revocation for chronic nuisance properties.

**WHEREAS**, state law empowers code cities to define and abate nuisances and impose fines upon persons responsible for creating or allowing nuisances, RCW 35A.21.160, RCW 35.22.280(30); and

**WHEREAS**, the SeaTac City Council finds that people should be able to enjoy ownership, use and possession of property without the negative impacts caused by chronic nuisance properties; and

**WHEREAS**, some persons who own or control property in the City of SeaTac allow their properties to be used for illegal purposes, with the result that these properties have become chronic nuisance properties; and

**WHEREAS**, chronic nuisance properties are a financial burden to the City by the repeated calls for service to the properties; and

**WHEREAS**, the current provisions of the SeaTac Municipal Code (SMC) do not provide adequate tools for abating chronic nuisances; and

**WHEREAS**, chronic nuisance properties present serious health, safety and welfare concerns and interfere with the quality of life and comfort of other persons residing in the neighborhood; and

**WHEREAS**, the City finds that the provisions of this Ordinance are necessary for the public health, safety and welfare.

**NOW, THEREFORE, THE CITY COUNCIL OF THE CITY OF SEATAC, WASHINGTON, DO ORDAIN as follows:**

**Section 1.** A new Chapter 7.50 is added to the SeaTac Municipal Code to read as follows:

**Chapter 7.50  
CHRONIC NUISANCE PROPERTIES**

Sections:

7.50.010	Purpose.
7.50.020	Definitions.
7.50.030	Violations.
7.50.040	Declaration of chronic nuisance property and procedure.
7.50.050	Owner cooperation.
7.50.060	Correction agreement.
7.50.070	Penalties.
7.50.080	Commencement of action.
7.50.090	Burden of proof.
7.50.100	Remedies.
7.50.110	Additional remedies.
7.50.120	Suspension or revocation of business license.

**7.50.010 Purpose.**

People should be able to enjoy ownership, use and possession of property without negative interference from chronic nuisance properties. The intent of the City Council in enacting this chapter is to exercise specific powers granted by the State of Washington to declare what shall be a nuisance, abate the same, and to impose fines upon parties who create, continue, or suffer nuisances to exist. In addition, the City Council intends to exercise the specific power granted by the State of Washington to provide for the punishment of all practices dangerous to public health or safety, and to make all regulations necessary for the preservation of public morality, health, peace, and good order within its limits.

Chronic nuisance properties present significant health, safety and welfare concerns, where the persons responsible for such properties fail to take corrective action to abate the nuisance condition. Chronic nuisance properties can have a tremendous negative impact upon the quality of life, safety and health of the neighborhoods where they are located. Chronic nuisance properties can be a financial burden to the City due to repeated calls for service necessitated by nuisance activities that repeatedly occur or exist on such properties. This chapter is enacted to provide a remedy for nuisance activities that are particularly disruptive to quality of life and repeatedly occur or exist at properties and provide a practical process for abating such activities and for holding accountable the persons ultimately responsible for such properties. This remedy is not the exclusive remedy available under state or local laws and may be used in conjunction with such other laws.

**7.50.020 Definitions.**

For purposes of this chapter, the following words or phrases shall have the meaning prescribed below:

- A. "Abate" means to repair, replace, remove, destroy, or otherwise remedy a condition

which constitutes a violation of this chapter by such means and in such a manner and to such an extent as the chief of police determines is necessary in the interest of the general health, safety and welfare of the community.

- B. "Chief of Police" means the Chief of Police of the City of SeaTac or his or her designees.
- C. "City Attorney" means the City Attorney of the City of SeaTac or his or her designees.
- D. "Chronic nuisance property" means the following:
  - 1. A property on which three or more nuisance activities as described in this section exist or have occurred during any 60-day period; or
  - 2. A property on which seven or more nuisance activities as described in this section exist or have occurred during any 12-month period; or
  - 3. A property which, upon a request for execution of a search warrant, has been the subject of a determination by a court two or more times within a 12-month period that probable cause exists that illegal possession, manufacture or delivery of a controlled substance or related offenses as defined in Chapter 69.50 RCW has occurred on the property.
- E. "Control" means the power or ability to direct or determine conditions, conduct, or events occurring on a property.
- F. "Nuisance activity" includes the following:
  - 1. A "most serious offense" as defined in Chapter 9.94A RCW;
  - 2. A "drug related activity" as defined in RCW 59.18.130;
  - 3. Promoting, advancing or profiting from prostitution as defined in Chapter 9A.88 RCW;
  - 4. Any of the following activities, violations, offenses, behaviors or criminal conduct:
    - a. Assault and other offenses involving physical harm, sexual offenses, sexually explicit material, harassment, sexual offenses relative to minors as defined in SMC 8.05.400;
    - b. Obstructing a police officer as defined in SMC 8.05.145;
    - c. Public disturbance, disorderly conduct, public nuisance, indecent exposure, public sexual contact, noise, controlled substances as defined in SMC 8.05.280 through 8.05.380;
    - d. Prostitution offenses, as defined in SMC 8.05.590 through 8.05.720;
    - e. Weapons offenses, as defined in SMC 8.05.560 through 8.05.580;
    - f. Trespass, prowling, theft, possession of stolen property, fraud as defined in SMC 8.05.490 through 8.05.510;
    - g. Malicious Mischief offenses, as defined by SMC 8.05.480
    - h. Any attempt, solicitation, or conspiracy to commit any of the above activities, behaviors or conduct as defined in SMC 8.05.260.

- G. "Owner" means any person who, alone or with others, has title or interest in any property.
- H. "Person" means an individual, group of individuals, corporation, partnership, association, club, company, business trust, joint venture, organization, or any other legal or commercial entity or the manager, lessee, agent, officer or employee of any of them.
- I. "Person in charge" of a property means the owner and, if different than the owner, any or all other persons in actual or constructive possession of a property, including, but not limited to, a lessee, tenant, occupant, agent, or manager of a property under his or her control.
- J. "Property" means any land, that which is affixed, incidental or appurtenant to land, including but not limited to any business or residence, parking area, loading area, landscaping, building or structure or any separate part, unit or portion thereof.
- K. "RCW" means the Revised Code of Washington, as in effect at the date of enactment of this chapter or as thereafter amended.
- L. "SMC" means SeaTac Municipal Code as in effect at the date of enactment of this chapter or as thereafter amended.

#### **7.50.030 Violations.**

- A. Any property within the City of SeaTac which is a chronic nuisance property is in violation of this chapter and subject to its remedies.
- B. It is the responsibility of all persons in charge of a property to ensure that the provisions of this code are met on any property they own, possess, or control. Any person in charge of a property declared to be a chronic nuisance property shall be in violation of this chapter and subject to its remedies.

#### **7.50.040 Declaration of chronic nuisance property and procedure.**

- A. The Chief of Police may declare that a property is a chronic nuisance property, as defined in this chapter, when there are specific facts and circumstances documenting (1) the occurrence of three or more nuisance activities on a property within 60 days or (2) the occurrence of seven or more nuisance activities on a property within a 12-month period, or (3) a property which, upon a request for execution of a search warrant, has been the subject of a determination by a court two or more times within a 12-month period that probable cause exists that illegal possession, manufacture or delivery of a controlled substance or related offenses as defined in Chapter 69.50 RCW has occurred on the property.
- B. Where a residential property is comprised of multiple dwelling units, the Chief of Police may confine the declaration of a chronic nuisance property to the dwelling unit(s) associated with the nuisance activity unless a broader declaration is needed to

achieve the intent of the chronic nuisance ordinance; provided, however, the person(s) in charge shall still have the same responsibilities and/or obligations under this chapter to address the chronic nuisance property and be subject to the same remedies.

- C. The Chief of Police shall provide written notice of this declaration to the person(s) in charge of the property. The notice shall be sent by first class mail or personally served, and a copy shall be sent by certified mail. If the person(s) in charge cannot after due diligence be personally served within King County and if an address for mailed service cannot after due diligence be ascertained, the notice of declaration shall be served by posting a copy of said notice conspicuously on the affected property or structure. Proof of service shall be made by a written declaration under penalty of perjury executed by the person effecting the service declaring the time and date of service, the manner by which the service was made and, if by posting, the facts showing that due diligence was used in attempting to serve the person personally or by mail.
- D. The notice shall include:
  - 1. The street address or a legal description sufficient for identification of the property;
  - 2. A declaration that the Chief of Police has determined the property has become a chronic nuisance property with a concise description of the nuisance activities that exist or that have occurred;
  - 3. A notice that the person(s) in charge of the property is subject to monetary penalties as set forth in this chapter;
  - 4. A demand the person(s) in charge of the property respond to the Chief of Police within seven (7) calendar days of service of the notice to discuss a course of action to correct the nuisance. Service of the notice shall be considered the date the person in charge is personally served or the date on which the notice is mailed certified mail;
  - 5. A notice that if the person(s) in charge does not respond to the Chief of Police as required in this section, or if the matter is not voluntarily corrected, the City may initiate an action to abate the property as a chronic nuisance property and/or take other action against the property or person(s) in charge as provided in this chapter or as otherwise permitted by law.
- E. If the person(s) in charge responds as required by the notice issued pursuant to this section and agrees to a course of action to abate the nuisance activities, a written correction agreement conforming to the requirements of SMC 7.50.060 shall be executed.
- F. Each person in charge shall be jointly and severally liable with all other persons in charge for any penalty, order or other remedy assessed and/or entered in accordance with this chapter. The Chief of Police's failure to send a notice of declaration to all persons in charge shall not be a defense to liability under this chapter for any

person(s) in charge who is provided with a notice of declaration as provided by this chapter.

**7.50.050 Cooperation.**

- A. Owner Cooperation. An owner who receives a copy of a notice pursuant to SMC 7.50.040 shall promptly take reasonable steps requested in writing by the Chief of Police to assist in abatement of the nuisance property. Such reasonable steps may include, but is not limited to, the owner pursuing eviction of the person in charge and/or tenants that are causing or permitting the chronic nuisance activities.
- B. Person in Charge/Manager Cooperation. A person in charge who receives a copy of a notice pursuant to SMC 7.50.040 shall promptly take reasonable steps requested in writing by the Chief of Police to assist in abatement of the nuisance property.

**7.50.060 Correction agreement.**

A correction agreement is a contract between the City and the owner(s) and/or person(s) in charge of the chronic nuisance property in which such person agrees to immediately take all lawful and reasonable actions, which shall be set forth in the agreement, to abate the nuisance activities within a specified time and according to specified conditions. The agreement shall be signed by the person in charge. The agreement shall include the following:

1. The name and address of the person in charge of the property;
2. The street address or a description sufficient for identification of the property, building, structure, or land upon or within which the nuisance is occurring;
3. A description of the nuisance activities;
4. The necessary corrective action to be taken, and a date or time by which correction must be completed;
5. An agreement by the person in charge that the City may inspect the property as may be necessary to determine compliance with the correction agreement;
6. An agreement by the person in charge that the City may abate the nuisance and recover its costs and expenses and monetary penalties pursuant to this chapter from the person in charge for the nuisance if the terms of the correction agreement are not met.

**7.50.070 Penalties.**

- A. Except as provided in this section, in addition to any other sanction or remedial procedure that may be available, the person in charge is subject to a penalty of five hundred dollars (\$500) per day from the date of the notice issued pursuant to SMC 7.50.040 until the Chief of Police confirms that the property is no longer a chronic nuisance property.
- B. If the agreed course of action results in the abatement of nuisance activities to the satisfaction of the Chief of Police within thirty (30) days of the notice issued pursuant to SMC 7.50.040, or such longer period allowed by the Chief of Police in writing, the matter shall be closed without further action or penalty against the person in charge.

- C. An owner who fails to comply with SMC 7.50.050 is subject to a civil penalty of up to twenty-five thousand dollars (\$25,000).
- D. A person in charge who has previously been found to have violated this chapter related to the same chronic nuisance property within the preceding twenty-four months shall be subject to double the penalties provided in subsection A of this section.
- E. The person in charge is not relieved of the duty to correct the violation by paying the penalty associated with such violation.

**7.50.08 Commencement of action.**

Upon referral from the Chief of Police, the City Attorney may initiate an action in King County Superior Court to abate a chronic nuisance property, and seek penalties pursuant to this chapter, alternative remedies under city or state laws and seek any other relief authorized by law.

**7.50.090 Burden of proof.**

The City shall have the burden of proof to show by a preponderance of the evidence that the property is a chronic nuisance property pursuant to this chapter. In an action against the owner to recover penalties authorized by SMC 7.50.070(C), the City shall have the burden to prove by a preponderance of the evidence that the owner failed to comply with SMC 7.50.050. Copies of police incident reports, reports of other city departments documenting nuisance activities, and witness statements shall be admissible in such actions. Additionally, evidence of a property's general reputation and the reputation of persons residing in or frequenting the property shall be admissible in such actions.

**7.50.100 Remedies.**

- A. If the court determines a property is a chronic nuisance property pursuant to this chapter, the court may order any of the following:
  - 1. Order the person in charge to immediately abate nuisance activity from occurring on the property;
  - 2. Orders the person in charge to cease renting or leasing the property;
  - 3. Order that the Chief of Police shall have the right to inspect the property to determine if the court's orders have been complied with;
  - 4. Impose a penalty of up to five hundred dollars (\$500) per day against the person in charge for each day from the date the notice was issued until the Chief of Police confirms that the property is no longer a chronic nuisance property;
  - 5. Order the property closed and secured against all unauthorized access, use and occupancy for a period up to one year;
  - 6. Make any other order that will reasonably abate nuisance activities from occurring on the property, including authorizing the City to take action to abate nuisance activities from occurring upon the property if other court orders are not complied with or do not abate nuisance activity on the property and providing that the costs of such city action are to be paid for by the person in charge of the property;



7. Assess and impose costs against the person in charge of the property in the amount it costs the City to abate, or attempt to abate, the chronic nuisance activity.
- B. If the court finds that an owner failed to take all reasonable steps requested in writing pursuant to SMC 7.50.050, the court may impose a civil penalty up to twenty-five thousand dollars (\$25,000).

**7.50.110 Additional remedies.**

In addition to the remedies authorized by SMC 7.50.100, if as part of its order abating a chronic nuisance property, the court orders a person in charge to cease renting or leasing a property, the court may order the person in charge to pay relocation assistance not to exceed three thousand dollars (\$3,000) to any tenant (1) who must relocate because of the order of abatement, and (2) the court finds the tenant did not cause or participate in nuisance activities at the property. For the purposes of this section, the term "tenant" shall have the same meaning as set forth in RCW 59.18.030.

**7.50.120 Suspension or revocation of business license.**

In addition to any other remedy that is authorized by this chapter or other laws, upon the finding by a court that a property is a chronic nuisance property pursuant to this chapter, the City may suspend or revoke a business license or other city license issued to the property, owner and/or person operating a business on the property.

**Section 2.** Section 5.05.180 of the SeaTac Municipal Code is amended to read as follows:

**5.05.180 Grounds for suspension or revocation.**

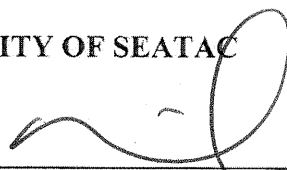
No business license issued pursuant to this chapter shall be suspended or revoked without cause. Cause for suspension or revocation shall include, but not be limited to, the following:

- A. The license was procured by fraud or misrepresentation of fact;
- B. The licensee has failed to comply with any of the provisions of this chapter;
- C. The licensee, or licensee's employees or agents, have been convicted of a crime, or suffered civil judgment or consent decree which bears a direct relationship to the conduct of the business licensed pursuant to this chapter;
- D. The licensee, or licensee's employees or agents, have violated any law or ordinance relating to the regulation of the business licensed pursuant to this chapter, or any health or safety ordinance;
- E. The licensee has caused or permitted a public nuisance to exist;
- F. The licensee, or licensee's employees or agents, have engaged in, have permitted or have acquiesced in unlawful drug related activity on the business premises;
- G. Licensee has failed to pay a civil penalty or to comply with any notice and order of the City Manager, or designee;
- H. Licensee's continued conduct of the business will, for any other reason, result in a danger to the public health, safety or welfare;
- I. The Chief of Police has issued a declaration of chronic nuisance property against the business pursuant to SMC Chapter 7.50.

**Section 3.** This Ordinance shall be in full force and effect five (5) days after passage and publication as required by law.

ADOPTED this 25<sup>th</sup> day of October, 2016, and signed in authentication thereof on this 25<sup>th</sup> day of October, 2016.

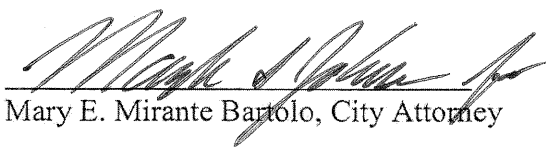
CITY OF SEATAAC

  
\_\_\_\_\_  
Michael Siefkes, Mayor

ATTEST:

  
\_\_\_\_\_  
Kristina Gregg, City Clerk

Approved as to Form:

  
\_\_\_\_\_  
Mary E. Mirante Bartolo, City Attorney

[Effective Date: 11/5/16]

**ORDINANCE NO. 16-1018**

AN ORDINANCE of the City Council of the City of SeaTac,  
Washington establishing a Neighborhood Sidewalk Committee as  
a standing advisory committee to the City Council.

**WHEREAS**, the City maintains and funds an ongoing Neighborhood Sidewalk Program  
to improve the functionality and safety of neighborhood streets; and

**WHEREAS**, it is important that the community play an active role in the Neighborhood  
Sidewalk Program to insure the needs of the community are being addressed; and

**WHEREAS**, the City Council finds that it is appropriate to establish a Neighborhood  
Sidewalk Committee as an advisory committee to the City Council;

**NOW, THEREFORE, THE CITY COUNCIL OF THE CITY OF SEATAC,  
WASHINGTON, DO ORDAIN** as follows:

**Section 1.** Purpose. The purpose of this Ordinance is to establish a Neighborhood Sidewalk Committee as an Advisory Committee to the City Council. The purpose of the Committee is to develop recommendations to Council regarding the funding, construction, site selection for sidewalk construction projects, and future maintenance of neighborhood sidewalk projects within the Community.

**Section 2.** Creation of the Committee. There is hereby created an advisory Committee which shall consist of nine (9) members; three (3) shall be Council Members appointed by the Mayor and six (6) shall be citizens representing a wide range of ages, neighborhoods, schools, cultures, religions, socio-economics, special needs, and skills that shall be appointed by the Mayor and confirmed by the City Council.

**Section 3.** Duties and Responsibilities. It shall be the responsibility of the Committee to make recommendations to City Council to help ensure that the Neighborhood Sidewalk Program meets the needs and goals of our community. Recommendations will be developed through the Committee's workplan. The workplan will include tasks such as:

1. Research best practices of other jurisdictions and vet those ideas within the community.

2. Develop, maintain and implement a project identification, ranking and selection process.

3. Seek innovative, community-based ideas through sustainable, two-way communication within the community.

4. Develop and provide oversight of program community outreach efforts.

The Committee Chair shall be appointed by the Mayor and the Vice-Chair shall be selected by the Committee Chair. The Committee shall make its own rules and regulations, and keep a record of its proceedings. A majority of the members shall be a quorum for the transaction of business.

**Section 4.** Terms and Vacancies. Upon creation of the Committee, five (5) members shall be appointed for two (2) year terms, and four (4) members shall be appointed for a one year term. Thereafter, members of the Committee shall serve for a term of two (2) years. In the event that there is a vacancy, a qualified successor shall be appointed by the Mayor subject to confirmation by the Council. The appointed successor will then be approved by the City Council to serve the remainder of the unexpired term.

**Section 5.** Compensation. Members of the Committee shall serve without compensation from the City for services performed.

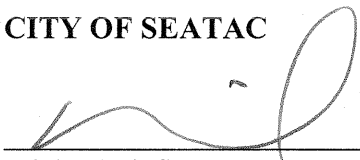
**Section 6.** Council Review. The City Council shall reserve the right to review the conduct, acts and decisions made by the Committee.

**Section 7.** City Staff Support. The City Manager shall ensure that the Committee has adequate staff support to carry out its purpose.

**Section 8.** Effective Date. This Ordinance shall be in full force and effect five (5) days after passage and publication as required by law.

ADOPTED this 25<sup>th</sup> day of October, 2016, and signed in authentication thereof on this 25<sup>th</sup> day of October, 2016.

CITY OF SEATAC

  
\_\_\_\_\_  
Michael Siefkes, Mayor

ATTEST:

Kristina Gregg  
Kristina Gregg, City Clerk

Approved as to Form:

Mary E. Mirante Bartolo  
Mary E. Mirante Bartolo, City Attorney

[Effective Date: 11/5/16]

[Neighborhood Sidewalk Committee]

**ORDINANCE NO. 16-1019**

AN ORDINANCE of the City Council of the City of SeaTac, Washington, repealing Chapter 5.05 of the SeaTac Municipal Code relating to Business Licenses and Regulations and replacing it with a new Chapter 5.05.

**WHEREAS**, the City Council has adopted a goal to improve services and processes throughout the City; and

**WHEREAS**, each department has developed a “Road Map” to guide their part in achieving each goal; and

**WHEREAS**, the process of review and issuing business licenses has been streamlined; and

**WHEREAS**, the existing Chapter 5.05 is not aligned with the streamlined business license process; and

**WHEREAS**, the new Chapter 5.05 creates a more efficient ordinance and supports a consistent, user friendly and streamlined business license process;

**NOW, THEREFORE, THE CITY COUNCIL OF THE CITY OF SEATAC, WASHINGTON, DO ORDAIN as follows:**

Section 1. Chapter 5.05 of the SeaTac Municipal Code is hereby repealed and replaced as follows:

**Chapter 5.05  
BUSINESS LICENSES AND REGULATIONS**

Sections:

- 5.05.010 Definitions.
- 5.05.020 Business License Required.
- 5.05.030 Separate Licenses Required.
- 5.05.040 Change in Nature or Location of Business.

- 5.05.050 Exemptions.
- 5.05.060 Non-Profit Organizations.
- 5.05.070 Application for License.
- 5.05.080 Fee.
- 5.05.090 Prorating Fee.
- 5.05.100 Term and Renewal of License.
- 5.05.110 Penalty for Late Application.
- 5.05.120 Duties of the City Manager or Designee.
- 5.05.130 Inspection, Investigation and Right of entry.
- 5.05.140 License Denial, Suspension or Revocation.
- 5.05.150 Denial, Suspension or Revocation of License Procedures.
- 5.05.160 Appeal of a Notice of Denial, Suspension or Revocation.
- 5.05.170 Continuation of License upon Death of License.
- 5.05.180 Assignment of License.
- 5.05.190 Engaging in Business without a License or Payment of Fee.
- 5.05.200 Violations, Penalties and Enforcement.
- 5.05.210 Pawnbrokers.
- 5.05.220 Charitable Solicitations.

#### **5.05.010 Definitions.**

For purposes of this chapter, the following definitions shall apply:

A. "Business" includes all activities engaged in with the object of gain, benefit, or advantage, directly or indirectly, except non-profit organizations as defined in 5.05.060. The term "business" shall specifically include the letting for rent or lease for residential occupancy on a month-to-month basis, or longer term, of any single-family structure, any multi-family structure containing more than one (1) dwelling unit, or spaces within a mobile home park.

B. "Person" means any individual, corporation, company, firm, joint stock company, copartnership, joint venture, trust, business trust, club, association, society, or any group of individuals acting as a unit, whether mutual, cooperative, fraternal, nonprofit, or otherwise, receiver, administrator, executor, assignee, or trustee in bankruptcy.

C. "Year" means the twelve (12) month period commencing April 1st and ending on the following March 31st.

#### **5.05.020 Business License Required.**

A. No person shall conduct, maintain, operate, or engage in any business within the City without first applying for and obtaining a business license and paying the fee as prescribed herein.

B. The business license is not transferable except as provided in 5.05.170. A business owner acquiring an existing business in the City must obtain a new business license.

C. The business license issued by the City shall be displayed in a conspicuous place on the premises identified on the license.

**5.05.030 Separate License Required.**

A separate business license shall be obtained for each separate location, within the City, at which the business is conducted. A separate business license shall be obtained for each different and discrete business conducted by any person, whether at the same location, within the City, as another licensed business, or at a different location within the City.

**5.05.040 Change in Nature or Location of a Business.**

Each business license shall authorize a particular type of business at the designated location. Any change in the nature of the business shall necessitate a new application for a business license. A change of location shall be reported to the City Manager, or designee, in writing, within ten (10) days of the change and, if in compliance with zoning and business regulatory ordinances, the existing business license shall be transferred to the new location.

**5.05.050 Exemptions.**

Notwithstanding the requirement of SMC 5.05.020, the following shall be exempted from the requirement to apply for and obtain a business license:

A. Casual or isolated sales made by persons who are not engaged in the business of selling the type of property involved, providing that not more than four (4) such sales are made during any year.

B. Sales, delivery, or peddling of any fruits, vegetables, berries, eggs, or any farm produce or edibles raised, gathered, produced, or manufactured by any farmer, gardener, or other person; provided, that this exemption shall not apply to any person selling, delivering, or peddling any dairy product, meat, poultry, eel, fish, mollusk, or shellfish.

C. Persons engaged in any business within the City which is licensed and regulated by King County pursuant to Interlocal Agreement, including the following:

1. Persons engaged in the business of operating taxi cabs and for-hire vehicles within the City, which are subject to SeaTac Ordinance No. 90-1014 codified in Chapter 5.15 SMC, and the "For-Hire Interlocal Agreement" between King County and the City.

D. Minors engaged in babysitting, delivery of newspapers, mowing lawns, washing cars, and similar activities.

E. Service oriented clubs and organizations such as Rotary, Kiwanis, Soroptimist, Lions, Jaycees, Boy Scouts, Girl Scouts and Campfire, or school sponsored clubs, such as DECA, FBLA, FFA and Key Club involved in special charitable fund-raising events, provided that in order for this exemption to apply, the club must be organized in and regularly meet within the corporate limits of the City, or within the corporate limits of a city immediately adjacent thereto. If requests are received for this exemption for clubs or organizations not specifically listed above, the City Manager or designee shall have the discretion to determine whether or not the exemption applies.



**5.05.060 Non-Profit Organization.**

A. Non-profit organizations recognized by the Federal Government as a 501(c)(3) organization, with proper documentation are exempted from the requirement to pay fees associated with the issuance of a business license as required by this chapter. Applicants shall provide one (1) of the following:

1. Form 1023, Application for Recognition of Exemption; or
2. IRS Determination Letter; or
3. IRS Affirmation Letter

However, non-profit organizations are still required to apply for and obtain a valid business license and comply with all other provisions of this chapter.

B. Failure to register a non-profit organization with the City will result in a penalty as established by the City's Schedule of License Fees, Permit Fees, Other Fees and Charges for City Services.

**5.05.070 Application for License.**

No business license shall be issued except upon application therefor made on forms prescribed by the City Manager, or designee. Upon approval of the application, the business license shall be issued by the City and either is mailed to the applicant or available for pick up at SeaTac City Hall during normal business hours. In event of denial, the fee paid shall be returned to the applicant together with notice that the application has been denied.

**5.05.080 Fee.**

A. Business license fees are established by the City's Schedule of License Fees, Permit Fees, Other Fees and Charges for City Services.

B. Appeal fees are established by the City's Schedule of License Fees, Permit Fees, Other Fees and Charges for City Services.

**5.05.090 Prorating Fee.**

The license fee shall be for the year, and each applicant must pay the full license fee for the current year or portion thereof during which the applicant has engaged in business.

**5.05.100 Term and Renewal of License.**

A. All business licenses shall be effective for the year of issuance. Licenses issued during a year shall be effective from the date of issue until March 31<sup>st</sup>. Unless renewed, as provided in this chapter, each such business license shall expire and be of no force or effect on April 1st of the ensuing year, unless sooner revoked as provided in this chapter.

B. All business licenses shall be renewed by the licensee on or before April 1st of the year of issuance, if the business is to be continued. Application for renewal shall be made on forms prescribed by the City Manager, or designee. Each application for renewal shall be accompanied by the license renewal fee for the ensuing year as prescribed by the City's Schedule of License

Fees, Permit Fees, Other Fees and Charges for City Services. Applications for renewal shall be processed by the City commencing on February 1st of each year for the ensuing year.

C. A business that is inactive or no longer doing business in the City may request dormant status by indicating so on the "Renewal Notice" and returning the notice to the City. A business that has requested and been granted dormant status, but resumes business activity within the City shall reapply for a business license.

**5.05.110 Penalty for Late Application.**

Any licensee, who shall fail to make application for an original business license or for renewal and/or fail to pay the renewal fee, prior to April 1st of the applicable year, shall be subject to a penalty, which shall be added to the prescribed fee:

A. Delinquent as of May 1<sup>st</sup>:

1. A 30 day penalty letter mailed to the licensee;
2. In addition to the business license fee, a penalty will be assessed per the City's Schedule of License Fees, Permit Fees, Other Fees and Charges for City Services.

B. Delinquent as of June 1<sup>st</sup>:

1. Notify the licensee in writing by certified mail that they have thirty (30) days to apply and obtain a business license or be issued a "Notice of Infraction";
2. In addition to the business license fee, a penalty will be assessed per the City's Schedule of License Fees, Permit Fees, Other Fees and Charges for City Services;
3. Pay all accrued penalties;

C. Delinquent as of July 1<sup>st</sup>:

1. Pay all accrued late penalties;
2. A "Notice of Infraction" is issued per SMC 1.15.065;
3. Subject to a Hearing before the Municipal Judge per SMC 1.15.075; and
4. A fine levied by the Municipal Judge up to \$250.00

D. Any business that has been granted dormant status is not subject to late penalties unless they resume business activity within the City without reapplying for a business license.

**5.05.120 Duties of the City Manager or Designee.**

The City Manager, or designee, is authorized and directed to enforce the terms and provisions of all business license and regulations ordinances.

**5.05.130 Inspections, Investigations, and Right of Entry.**

A. All applications for licenses may be investigated by the City Manager, or designee, and the business premises may likewise be inspected.

B. The City Manager, or designee, is authorized to make such inspections of licensed premises and take such action as may be required to enforce the provisions of any business license ordinance. The City Manager may designate any appropriate City employee as an inspector, to undertake such inspections. Inspections shall, to the extent possible, be in compliance with the following procedure:

1. An inspector may enter any licensed business location or any business location that is required by ordinance to be licensed, at any reasonable time, to inspect the same or perform any duty imposed on the City Manager, or designee, by any business license or regulation ordinance.
2. If the place of business is occupied, the inspector shall first present proper credentials and demand entry and right to inspect.
3. If the place of business is unoccupied, the inspector shall first make a reasonable effort to locate the licensee or other person having charge or control of the premises and shall then present proper credentials and demand entry and right to inspect.
4. No licensee, employee or agent, shall fail or neglect, after proper demand, to admit the inspector, acting within the scope of the inspector's employment, to any location licensed for business, or to interfere with the inspector while in the performance of the inspector's duty.
5. Nothing herein shall prevent or prohibit undercover investigations or inspections by appropriate officers in appropriate circumstances.

**5.05.140 Basis for License Denial, Suspension or Revocation.**

A business license may be denied, suspended or revoked by the City Manager, or designee. The City Manager, or designee, shall notify the applicant or licensee in writing of the denial, suspension, or revocation of the business license and the grounds thereof. A business license may be denied, suspended or revoked for any of the following reasons:

- A. The license was procured by fraud or misrepresentation of fact or contains misleading statements or suppression of material facts about the business.
- B. The applicant or licensee failed to pay any fee or is in default of any fee, charges or amounts due and payable to the City of SeaTac as outlined in the SeaTac Municipal Code or City's Schedule of License Fees, Permit Fees, Other Fees and Charges.
- C. The building structure, equipment, operation or location of the business for which the license was issued does not comply with the requirements or standards of the SeaTac Municipal Code.
- D. The applicant or licensee has failed to comply with any of the provisions of this chapter.
- E. The applicant or licensee has applied for a business license for activities that are prohibited by law.

F. The licensee, owner, or operator of the business is currently operating a business in a manner that is prohibited by law.

G. The applicant or licensee, owner, operator, or an employee has been convicted of a crime involving the business or suffered a civil judgment which bears a direct relationship to the conduct of the business pursuant to this chapter.

H. The licensee, or licensee's employees or agents, have engaged in, have permitted or have acquiesced in unlawful drug related activity on the business premises.

I. The licensee has caused or permitted a public nuisance to exist.

J. The applicant or licensee has failed to pay a civil penalty or to comply with any notice.

K. The applicant or licensee has failed to comply with State or Federal law.

L. It is necessary to deny, suspend, or revoke the license for the protection of the public health, safety, peace or welfare.

M. The Chief of Police has issued a declaration of chronic nuisance property against the business pursuant to SMC Chapter 7.05.

**5.05.150 Procedures for a Denial, Suspension or Revocation of a Business License.**

A. Denial, Suspension or Revocation of license. Any action to deny, suspend or revoke a business license applied for or issued shall be commenced by notice of the denial, suspension or revocation. A notice issued under this section shall substantially comply with the following:

1. The notice shall be delivered, by first class mail or certified mail, to the business license applicant or the holder of the business license as set forth in the most recent business license application.
2. The notice shall describe the basis for the denial, suspension or revocation.
3. The notice shall describe corrective action, if any, that may be taken to eliminate the basis for the denial, suspension or revocation.
4. The notice shall specify a date for which an appeal may be filed with the City Clerk. Such a date shall occur thirty (30) days from the date of the notice of denial, suspension or revocation and shall be made on forms provided by the City Clerk. The applicable appeal fee per the City's Schedule of License Fees, Permit Fees, Other Fees and Charges for City Services shall be paid at the time of filing.
5. The notice shall provide that if the applicant or licensee fails to respond within thirty (30) days from the date of the notice of denial, suspension or revocation that shall constitute a waiver of the right to a hearing.

6. The business may continue to operate until such time as the Hearing Examiner issues a decision on the denial, suspension or revocation.

**5.05.160 Procedures for an Appeal of a Notice of Denial, Suspension or Revocation.**

A. The City Hearing Examiner is designated to hear appeals by applicants or licensees aggrieved by actions of the City Manager, or designee, pertaining to any denial, suspension, or revocation of a business license.

B. The Hearing Examiner procedures are found in SeaTac Municipal Code (SMC) Chapter 1.20 Hearing Examiner System.

C. Any licensee may, within thirty (30) days after receipt of a notice denial, suspension or revocation, file with the City Clerk a written notice of appeal containing the following:

1. A heading with the words: "Before the City Manager or designee of the City of SeaTac".
2. A caption reading: "Appeal of \_\_\_\_\_" giving the names of all appellants participating in the appeal.
3. A brief statement setting forth the legal interest of each of the appellants in the business involved in the notice of denial, suspension or revocation.
4. A brief statement, in concise language, of the specific notice protested, together with any material facts claimed to support the contentions of the appellant or appellants.
5. A brief statement, in concise language, of the relief sought, and the reasons why it is claimed the protested notice or denial, suspension or revocation should be reversed, modified, or otherwise set aside.
6. The signatures of all persons named as appellants, and their official mailing addresses.
7. The verification (by declaration under penalty of perjury) of each appellant as to the truth of the matters stated in the appeal.

D. As soon as practicable after receiving the written appeal, but not greater than thirty (30) days, the City Clerk shall fix a date, time, and place for the hearing of the appeal by the Hearing Examiner. Written notice of the time and place of the hearing shall be given at least ten (10) days prior to the date of the hearing by the City Clerk, by mailing a copy thereof, postage prepaid, by certified mail with return receipt requested, addressed to each appellant at his or her address shown on the notice of appeal.

E. At the hearing, the appellant or appellants shall be entitled to appear in person, and to be represented by counsel and to offer such evidence as may be pertinent and material to the denial, suspension or revocation of the notice. The technical rules of evidence need not be followed.

F. Only those matters or issues specifically raised by the appellant or appellants in the written notice of appeal shall be considered in the hearing of the appeal.

G. Within ten (10) business days following conclusion of the hearing, the Hearing Examiner shall make written findings of fact and conclusions of law, supported by the record, and a decision which may affirm, modify, or overrule the order of the City Manager, or designee, and may further impose terms as conditions to issuance or continuation of a business license.

H. Failure of any applicant or licensee to file an appeal in accordance with the provisions of this chapter shall constitute a waiver of the right to a hearing.

I. The decision of the Hearing Examiner is considered final and conclusive per SeaTac Municipal Code (SMC) 1.20.100 (H).

J. Enforcement of any civil penalty, denial, suspension or revocation of any business license, or other order of by the City Manager, or designee, shall be stayed during the pendency of an appeal therefrom which is properly and timely filed.

**5.05.170 Continuation of License Upon Death of Licensee.**

In event of the death of any licensee, his or her duly appointed executor or administrator may continue to conduct business under the license issued to the decedent for the unexpired term thereof, upon filing proof of such appointment with the City Manager or designee.

**5.05.180 Assignment of Licenses.**

Every business license shall be personal to the licensee and shall not be assignable or transferable to any person, except as provided in 5.05.170.

**5.05.190 Engaging in Business Without a License or Payment of Fee.**

If any person engaged in a business without a license, fails or refuses to pay the prescribed license fee for any year, the City Manager or designee shall follow these procedures:

A. Notify the licensee in writing by first class mail, certified mail or personal service that they are operating a business within the City limits without a business license and have thirty (30) days to apply and obtain a business license as specified in SMC 5.05.020.

B. If the licensee fails to respond to the letter within thirty (30) days, the licensee will be subject to a fine of a maximum of \$250, and the City Manager or designee shall follow the procedures for a Notice of Infraction in SMC 1.15.065 and Hearing before the Municipal Court Judge in SMC 1.15.075.

**5.05.200 Violations, Penalties and Enforcement.**

A. It is unlawful for any person either directly or indirectly to engage in or conduct any business within the City without having first obtained a business license as required pursuant to this chapter.

B. It is unlawful for any person either directly or indirectly to engage in or conduct any business within the City without obtaining a renewed business license for the current year as required pursuant to this chapter.

C. Each day that a person engages in or conducts any business without a valid business license constitutes a separate offense.

D. Any violation of this chapter, or failure to comply with any requirements of this chapter, shall be subject to the penalties prescribed in Chapter 1.15 SMC. The penalties set forth herein are not exclusive. The City Manager or his/her designee may seek civil enforcement, civil penalties, and remedies in accordance with law, in addition to any criminal penalties that may apply for violation of this chapter.

#### **5.05.210 Pawnbrokers.**

The following listed sections of Chapter 6.56 King County Code as now in effect, and as may be subsequently amended, are adopted by reference, except that, unless the context indicates otherwise, the words "County" or "King County", and references to occurrences within the geographic boundaries of "King County outside the limits of incorporated cities and towns" shall refer to the City and its geographic boundaries, the word "director" shall refer to the City Manager, or designee, and that the penalties for late payment of license fees shall be as prescribed at SMC 5.05.110.

- 6.56.010 License required.
- 6.56.020 Pawnbroker and pawnshop defined.
- 6.56.030 License fees as established by the City's Schedule of License Fees, Permit Fees, Other Fees and Charges for City Services.
- 6.56.040 Application for license.
- 6.56.050 Personal property tax return.
- 6.56.080 Records required.
- 6.56.090 Compliance required.
- 6.56.100 Transcript to be furnished.
- 6.56.110 Records and articles to be available for inspection.
- 6.56.120 Seller or consignee to give true name and address.
- 6.56.130 Authorized rate of interest – Penalty for violation.
- 6.56.140 Prima facie evidence of violation.
- 6.56.150 Period of redemption.
- 6.56.160 Certain transaction prohibited.
- 6.56.170 Pawnshop to be closed during certain hours.

It is provided, however, that no pawnbroker's license shall be issued which would increase the number of holders of such licenses to more than one (1) for every fifteen thousand (15,000) of population or fractional part thereof, according to the last preceding Federal census, provided that this population limitation shall not operate to prohibit the licensing of any pawnbroker duly licensed prior to the enactment of this chapter, if such pawnbroker is otherwise duly qualified.

#### **5.05.220 Charitable Solicitations.**

The following listed sections of Chapter 6.76 King County Code as now in effect, and as may be subsequently amended, are hereby adopted by reference, except that, unless the context indicates otherwise, the words “County” or “King County”, and references to occurrences within the geographic boundaries of “King County outside the limits of incorporated cities and towns” shall refer to the City and its geographic boundaries, the words “director” and “Division of the Comptroller” shall refer to the City Manager, or designee.

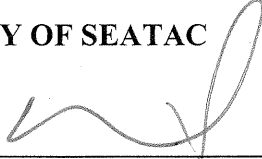
- 6.76.010 Definitions.
- 6.76.020 Soliciting for private needs prohibited.
- 6.76.030 Permit – Required – Exemptions.
- 6.76.040 Permit – Application – Contents.
- 6.76.050 Permit – Application – Investigation.
- 6.76.060 Permit – Application – State registration in lieu of.
- 6.76.070 Permit – Issuance.
- 6.76.080 Permit - Fees, except the fee, refer to the City of SeaTac’s Schedule of License Fees, Permit Fees, Other Fees and Charges for City Services
- 6.76.090 Permit – Term.
- 6.76.100 Credentials.
- 6.76.110 Permit – Expiration – Return.
- 6.76.120 Written receipts required.
- 6.76.140 Permit – Suspension or revocation – Notice to Director of Public Safety.
- 6.76.150 Books and records of permit holders.
- 6.76.160 Financial reports.
- 6.76.170 Religious solicitations – Certificate of registration – Required.
- 6.76.180 Religious solicitations – Certificate of registration – Regulations.
- 6.76.190 Fraudulent misrepresentation and misstatements prohibited.
- 6.76.200 Violation – Penalty.
- 6.76.210 Civil penalty.
- 6.76.220 Additional enforcement.



Section 2. This Ordinance shall be in full force and effect five (5) days after passage and publication as required by law.

**ADOPTED** this 8<sup>th</sup> day of November, 2016, and signed in authentication thereof on this 8<sup>th</sup> day of November, 2016.

**CITY OF SEATAC**

  
\_\_\_\_\_  
Michael Siefkes, Mayor

ATTEST:

  
\_\_\_\_\_  
Kristina Gregg, City Clerk

Approved as to Form:

  
\_\_\_\_\_  
Mary E. Mirante Bartolo, City Attorney

[Effective Date: 11/19/16]

**ORDINANCE NO. 15-1020**

AN ORDINANCE of the City Council of the City of SeaTac, Washington, authorizing special legal service expenditures for outside counsel and amending the City's 2015-2016 Biennial Budget.

**WHEREAS**, it is necessary for the City Council to authorize outside litigation expenditures that are in excess of the City Manager's contracting authority; and

**WHEREAS**, and amendment to the City's 2015-2016 Biennial Budget is necessary to transfer funds, based on actual expenditures, from the City's Surface Water Management Fund (SWM Fund #403) to the City's General Fund, so that the City's General Fund does not bear the expense of legal services solely related to the SWM Fund;

**NOW, THEREFORE, THE CITY COUNCIL OF THE CITY OF SEATAC, WASHINGTON, DO ORDAIN as follows:**

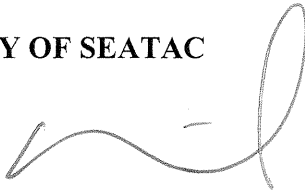
**Section 1.** The City Council authorizes special legal service expenditures for Gordon Thomas Honeywell and Gordon Tilden Thomas & Cordell.

**Section 2.** A transfer in the 2015-2016 Biennial City Budget is authorized, up to \$50,000, from Surface Water Management Utility Fund (SWM Fund #403) to the General Fund (Fund #001), to be based on actual expenditures for legal services solely related to the SWM Fund.

**Section 3.** This Ordinance shall be in full force and effect five (5) days after passage and publication as required by law.

**ADOPTED** this 8<sup>th</sup> day of November, 2016, and signed in authentication thereof on this 8<sup>th</sup> day of November, 2016.

**CITY OF SEATAC**

  
\_\_\_\_\_  
Michael Siefkes, Mayor

ATTEST:

  
Kristina Gregg, City Clerk

Approved as to Form:

  
Mary E. Mirante Bartolo, City Attorney

[Effective Date: 11/19/16]

[Litigation expenditures and budget amendment]

**ORDINANCE NO. 16-1021**

AN ORDINANCE of the City Council of the City of SeaTac, Washington, amending Chapters 11.05, 11.10 & 12.10 to the SeaTac Municipal Code, related to road standards, right-of-way use, and surface and stormwater management.

**WHEREAS**, the 2013 Western Washington Phase II Municipal Stormwater Permit (the Permit) issued and administered by the Washington State Department of Ecology (Ecology) requires permittees to update applicable codes, standards and policies to mandate the use of low impact development (LID) techniques where feasible by December 31, 2016.

**WHEREAS**, the Permit specifies that the intent of the above required code updates is to make LID the preferred and commonly used approach to development; and

**WHEREAS**, the City of SeaTac desires to meet the terms of the Permit;

**NOW, THEREFORE, THE CITY COUNCIL OF THE CITY OF SEATAC, WASHINGTON, DO ORDAIN** as follows:

**Section 1.** Portions of Chapters 11.05, 11.10 and 12.10 of the SeaTac Municipal Code are hereby amended to read as shown in Appendix A. City Staff is also authorized to create a City addendum to the King County Surface Water Design Manual and an addendum to the Road Standards.

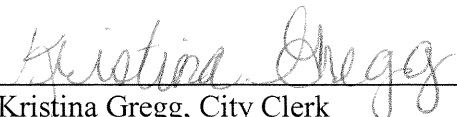
**Section 2.** This Ordinance shall be in full force and effect on January 1, 2017.

**ADOPTED** this 22nd day of November, 2016, and signed in authentication thereof on this 22nd day of November, 2016.


**CITY OF SEATAC**

  
\_\_\_\_\_  
Michael J. Siefkes, Mayor

ATTEST:

  
\_\_\_\_\_  
Kristina Gregg, City Clerk

Approved as to Form:

  
\_\_\_\_\_  
Mary E. Mirante Bartolo, City Attorney

[Effective Date: 1/1/17]

[Amends SMC 11.05, 11.10 & 12.10.010]

## **APPENDIX A**

### **Amendments to SMC Chapter 11.05**

#### **11.05.040 Standard specifications for road and bridge construction.**

The ~~1991~~–2016 edition of the Standard Specifications for Road, Bridge and Municipal Construction, published by the American Public Works Association and the Washington State Department of Transportation, as presently existing or as may subsequently be amended, is hereby adopted by reference. [Amendments to requirements outlined in the WSDOT Standard Specifications for Road, Bridge, and Municipal Construction are documented in the City of SeaTac Addendum to Road Standards document.](#)

#### **11.05.050 Road construction rules.**

The King County Road Construction Rules, as authorized by Section 14.24.010 of the King County Code, are adopted by reference as the City road construction rules, except Sections 2.02, 2.03 and 2.04 thereof, which are hereby replaced with the City’s standards for urban public streets promulgated by the City Department of Public Works. [Amendments to requirements outlined in the King County Road Standards are documented in the City of SeaTac Addendum to Road Standards document.](#) The Department of Public Works shall print copies of the City standards, and subsequent revisions and additions thereto, and make the same available to anyone proposing to do work on City rights-of-way. The Department shall also prepare and periodically update a City bonding schedule for use in determining appropriate construction, maintenance or restoration bonds for road and drainage facilities developed in compliance with the adopted standards.

#### **11.05.100 City road standards.**

The following sections of Chapter 14.42 King County Code as now in effect, and as may be subsequently amended, are hereby adopted by reference, except that, unless the context indicates otherwise, the word “County” and the words “King County” shall refer to the City:

- 14.42.010 Adoption.
- 14.42.020 Terms.
- 14.42.030 Applicability.
- 14.42.040 Developments.
- 14.42.050 References.
- 14.42.060 Variances.

14.42.062 Appeals from decisions on variances.

14.42.070 Penalties.

14.42.080 Severability.

The City has developed a City of SeaTac Addendum to Road Standards document that amends the WSDOT Standard Specifications for Road, Bridge and Municipal Construction and the King County Road Standards and includes City-specific requirements.

### **Amendments to SMC Chapter 11.10**

#### **11.10.080 Right-of-way use permits.**

The following classes of right-of-way use permits are hereby established.

##### **A. Class A and B – Short-Term.**

1. Class A and B permits may be issued for use of a right-of-way for seventy-two (72) or less continuous hours for the purposes which do not involve the physical disturbance of the right-of-way. These classes of use may involve disruption of pedestrian and vehicular traffic or access to private property and may require inspections, cleanup, and police surveillance. For periods longer than seventy-two (72) hours, these uses will be considered Class D, long-term and permanent.

2. Class A permits include but are not limited to the following:

- a. Assemblies;
- b. Bicycle races;
- c. Block parties;
- d. Parades;
- e. Parking;
- f. Processions;
- g. Nonmotorized vehicle races;
- h. Street dances;
- i. Street runs and walks.

3. Class B permits include but are not limited to the following:

- a. Fairs;
- b. House or other large structure moves other than those which require a Class E permit;
- c. Temporary sale of goods;
- d. Temporary street closures.

B. Class C – Disturbance of City Right-of-Way.

1. Class C permits may be issued for use of a right-of-way, for a period not in excess of one hundred eighty (180) days, for activities that may alter the appearance of or disturb the surface or subsurface of the right-of-way on a temporary or permanent basis. For those projects associated with a building permit, Class C permit duration may be extended by the Director or designee to a maximum of two years in order to match building permit duration.

2. Class C permits include but are not limited to:

- a. Boring;
- b. Culverts;
- c. Curb cuts;
- d. Paving;
- e. Drainage facilities;
- f. Driveways;
- g. Fences;
- h. Landscaping;
- i. Maintaining or removing street trees;
- j. Painting;



jk. Sidewalks;

kl. Street trenching.

#### C. Class D – Long-Term and Permanent.

1. Class D permits may be issued for use of a right-of-way, for a period not in excess of one hundred eighty (180) days, for activities for extended periods of time but which will not physically disturb the right-of-way.

2. The use of a right-of-way for structures, facilities, and uses that involve capital expenditures and long-term commitments of use require this type of permit.

3. Class D permits include but are not limited to:

- a. Air rights and aerial facilities;
- b. Bus shelters and stops;
- c. Access to construction sites and haul roads;
- d. Loading zones;
- e. Newspaper sale, distribution, and storage facilities;
- f. Recycling facilities;
- g. Sales structures;
- h. Sidewalk cafes;
- i. Special and unique structures, such as: awnings, benches, clocks, decorations, flagpoles, fountains, kiosks, marquees, private banners, public mailboxes, and street furniture;
- j. Underground rights;
- k. Utility facilities;
- l. Waste facilities.

#### D. Class E – Potential Disturbance of City Right-of-Way.

1. Class E permits may be issued for use of a right-of-way, for a period not in excess of one hundred eighty (180) days or as specified on the permit by the Director or designee, for those activities that have the potential of altering the appearance of or disturbing the surface or subsurface of the right-of-way on a temporary or permanent basis.

2. Class E permits include but are not limited to:

a. Frequent use hauling involving an average of six (6) vehicles per hour during any eight (8) hour period in one (1) day, for two (2) or more consecutive days;

b. Any hazardous waste hauling.

3. Class E permits may be issued to a general contractor to authorize construction, excavation and fill hauling activities by the said general contractor and by subcontractors.

4. Access Routes and Hours. All hauls in excess of fifty thousand (50,000) CY or hauling more than one hundred (100) working days will be required to use the following routes. The following roadways are limited for use as haul routes and the maximum ~~number of one-way trips per hour are~~ number of one-way trips per hour is identified by time of day.

Roadway Segments and Hours	Maximum One-Way Trips
a. South 188th Street, West of Tunnel	
6:00 a.m. – 8:00 a.m.	45
8:00 a.m. – 3:30 p.m.	45
3:30 p.m. – 5:30 p.m.	45 westbound 18 eastbound with no lane closure allowed
5:30 p.m. – 6:00 a.m.	45
b. South 188th Street, between SR99 and Tunnel	
6:00 a.m. – 8:00 a.m.	18
8:00 a.m. – 3:30 p.m.	30
3:30 p.m. – 5:30 p.m.	18 with no lane closure allowed
5:30 p.m. – 6:00 a.m.	30
c. South 188th Street, East of SR99	
6:00 a.m. – 8:00 a.m.	6

8:00 a.m. – 3:30 p.m.	12
3:30 p.m. – 5:30 p.m.	6 with no lane closure allowed
5:30 p.m. – 6:00 a.m.	6

d. International Blvd. (SR99), South of South 188th Street

6:00 a.m. – 8:00 a.m.	6
8:00 a.m. – 3:30 p.m.	12
3:30 p.m. – 5:30 p.m.	6 with no lane closure allowed
5:30 p.m. – 6:00 a.m.	12

e. International Blvd. (SR99), North of South 188th Street

6:00 a.m. – 8:00 a.m.	6
8:00 a.m. – 3:30 p.m.	6
3:30 p.m. – 5:30 p.m.	6 with no lane closure allowed
5:30 p.m. – 6:00 a.m.	12

5. Work Hour Limitations. Any hauling operation within the following hours will require a noise variance application submittal and approval from the Department prior to implementation:

10:00 p.m. to 7:00 a.m.	Monday to Friday
10:00 p.m. to 9:00 a.m.	Saturday and Sunday

#### **11.10.250 Backfilling.**

Backfilling in a right-of-way opened or excavated pursuant to a permit issued under the provisions of this chapter shall be compacted to a degree equivalent to that of the undisturbed ground in which the excavation was begun, unless the Director or designee determines a greater degree of compaction is necessary to produce a satisfactory result. All backfilling shall be accomplished according to City standards and specifications. If trenching or backfilling will be performed in areas where infiltration BMPs or vegetated LID BMPs exist, deviation from the City standards and specifications for compaction requirements may be allowed. All backfills shall be inspected and approved by the Director or designee prior to any overlaying or patching.

#### **11.10.270 Coordination of right-of-way construction.**

The permittee, at the time of receiving a Class C right-of-way use permit, shall notify all other public and private utilities known to be using or proposing to use the same right-of-way of the applicant's proposed construction and the proposed timing of such construction. A utility so

notified may, within seven (7) days of such notification, request of the Director or designee a delay in the commencement of any proposed construction for the purpose of coordinating other right-of-way construction with that proposed by the permittee. The Director or designee may delay the commencement date of the permittee's right-of-way construction for up to ninety (90) days, except in emergencies, if the Director or designee finds that such delay will reduce inconvenience to City right-of-way uses and if the Director or designee finds that from construction activities such delay will not create undue economic hardship on the applicant. The permittee must document and restore all paved areas and stormwater facilities, including permeable pavement.

### **Amendments to SMC Chapter 12.10**

#### **12.10.010 King County Surface Water Design Manual adopted by reference.**

The ~~2009-2016~~ King County Surface Water Design Manual (KCSWDM) and the City of SeaTac Addendum to the KCSWDM are hereby adopted by reference. They are collectively referred to in this title as the Surface Water Design Manual (SWDM). The above stormwater standards are adopted in compliance with the 2013 Western Washington (NPDES) Phase II Municipal Stormwater Permit.

#### **12.10.015 Definitions (New Section)**

A. "Best management practice (BMP)" means any schedule of activities, prohibition of practices, maintenance procedures, or structural and/or managerial practices that, when used singly or in combination, prevents or reduces the release of pollutants and other adverse impacts to surface water, stormwater and groundwater, while minimizing the potential for flooding, soil creep and soil instability.

B. "Low Impact Development (LID)" means a stormwater and land use management strategy that strives to mimic natural hydrologic processes of infiltration, filtration, storage, evaporation and transpiration by emphasizing conservation, use of on-site natural features, site planning, and distributed stormwater management practices that are integrated into a project design, while also minimizing the potential for off-site flooding and soil instability.

C. "Low Impact Development (LID) Best Management Practices (BMP)" means distributed stormwater management practices, integrated into a project design, that emphasize natural hydrologic processes of infiltration, filtration, storage, evaporation and transpiration, while protecting against off-site flooding and soil instability . LID BMPs include, but are not limited to, bioretention, permeable pavement, cast in place pavers, limited infiltration systems, roof downspout controls, dispersion, soil amendments, and minimal excavation foundations.

D. "Low Impact Development (LID) principles" means land use management strategies that emphasize conservation, use of on-site natural features, and site planning to utilize infiltration and native vegetation to minimize stormwater runoff, while protecting against remote area flooding and soil instability.

E. “Stormwater facilities” means drainage facilities or features used to meet water quality treatment and/or flow control requirements by utilizing processes such as infiltration, dispersion, storage, conveyance, evaporation, and transpiration.

F. “Surface Water Design Manual” means the King County Surface Water Design Manual (KCSWDM), as amended by the City of SeaTac Addendum to the KCSWDM adopted in SMC 12.10.010.

#### **12.10.075 Site Planning and Design. (New Section)**

The following site planning and design principles shall be applied where feasible: Site planning and design shall consider stormwater management, especially the design and integration of LID BMPs, as early as possible in the project planning phase; Locate buildings away from soils that provide effective infiltration; Site LID BMPs in areas with good infiltration capacity; Reduce impervious surfaces and retain native vegetation.

#### **12.10.100 Procedures and conditions related to construction timing and final approval.**

A. No work related to permanent or temporary storm drainage control shall proceed without the approval of the City Manager, or designee.

B. Erosion/sedimentation control measures associated with both the interim and permanent drainage facilities shall be:

1. Constructed in accordance with the approved plan prior to any grading or land clearing other than that associated with the erosion/sedimentation control plan;
2. Satisfactorily maintained until all improvements, restoration, landscaping and other requirements of the Surface Water Design Manual are completed and the potential for on-site erosion has passed.

C. Prior to the construction of any improvements and/or buildings on the site, those portions of the ~~drainage~~ stormwater facilities necessary to accommodate the control of surface and stormwater runoff discharge from the site must be constructed, ~~and be in operation~~ approved, and functioning properly. Existing LID BMPs and proposed LID locations shall be protected throughout site construction to ensure that they are not compacted, damaged, or filled with sediments.

D. Subdivisions only: Recording may occur prior to the construction of drainage facilities when approved in writing by the City Manager, or designee, but only to minimize impacts that may result from construction during inappropriate times of the year.

#### **12.10.110 Bonds and liability insurance required.**

The City Manager, or designee, is authorized to require all persons constructing ~~retention/detention~~ stormwater flow control and/or treatment facilities ~~and other drainage facilities~~ to post bonds. Where such persons have previously posted, or are required to post, other

bonds covering either the facility itself or other construction related to the facility, such person may, with the permission of the Public Works Director, or designee and to the extent allowable by law, combine all such bonds into a single bond; provided, that at no time shall the amount thus bonded be less than the total amount which would have been required in the form of separate bonds; and provided further, that such bond shall on its face clearly delineate those separate bonds which it is intended to replace.

#### **12.10.120 Stormwater~~Drainage~~ facilities restoration and site stabilization bond.**

Prior to commencing construction, the ~~person required to construct the drainage facility pursuant to the Surface Water Design Manual~~permittee shall post a ~~drainage-stormwater~~ facilities restoration and site stabilization bond (performance bond) in an amount sufficient to cover the cost of corrective work on or off the site which is necessary to provide adequate drainage, stabilize and restore disturbed areas, and remove sources of hazard associated with work which has been performed and is not completed. After determination by the ~~City Manager~~Public Works Director, or designee, that all facilities are constructed in compliance with approved plans, the ~~drainage facilities restoration and site stabilization performance~~ bond shall be released. The City may collect against the ~~drainage facilities restoration and site stabilization performance~~ bond when work is not completed in reasonable fashion and is found to be in violation of the conditions of the Surface Water Design Manual. The ~~City Manager~~Public Works Director, or designee, shall have discretion to determine whether the site is in violation of the requirements of this chapter, and whether the bond shall be collected to remedy the violation. Prior to final approval and release of the ~~drainage facilities restoration and site stabilization performance~~ bond, the ~~City Manager~~Public Works Director, or designee, shall conduct a comprehensive inspection for the purpose of observing that ~~the retention/detention facilities and other drainage~~stormwater facilities have been constructed according to plan, applicable specifications and standards.

#### **12.10.130 Defect and maintenance bond.**

After ~~satisfactory completion and approval~~ of the ~~drainage-stormwater~~ facility or ~~prior to~~ final plat approval, ~~whichever occurs last, the person required to construct the facility pursuant to this chapter~~the permittee shall post a defect and maintenance bond (stormwater maintenance bond) warranting the satisfactory performance and maintenance of the ~~drainage-stormwater~~ facility and guaranteeing the workmanship and materials used in the construction of the facility. Commercial facilities shall be bonded for a minimum period of two (2) one (1) years. New residential developments must post the stormwater maintenance bond until 90% of the lots are constructed or when construction is stopped and the site is fully stabilized. For subdivision retention/detention facilities over which the City may assume maintenance, pursuant to SMC 12.10.160, the defect and maintenance bond shall be posted for a period of two (2) years or until the City assumes maintenance, whichever is longer. The Public Works Director, or designee shall not release the ~~defect-stormwater~~ and maintenance bond until all inspection fees are paid.

#### **12.10.160 Maintenance of retention/detention facilities.**

A drainage facility or retention/detention facility located within and servicing only an individual parcel shall not be accepted by the City for maintenance and will remain the responsibility of persons holding title to the property within which the facility is located.

Maintenance of all subdivision drainage facilities or retention/detention facilities shall remain the responsibility of the person required to construct the facilities until all conditions of this section have been met.

Only after all of the following conditions have been met shall the City assume maintenance of the subdivision retention/detention facility:

A. All of the requirements of SMC 12.10.110 through 12.10.150 have been fully met.

B. All necessary easements or tracts entitling the City to ingress and egress and to properly maintain the retention/detention facility have been conveyed to the City and boundary survey stakes established.

C. The Public Works Director, or designee has conducted an inspection and determined that the facility has been properly maintained and is operating as designed. This inspection shall occur within two (2) years after posting of the defect and stormwater maintenance bond.

#### **12.10.220 Surface water management program.**

A. There is hereby created and established a Surface Water Utility and surface water management program, implementation of which shall be governed by the Surface Water Design Manual adopted pursuant to SMC 12.10.010.

B. The surface water management program is necessary in order to promote public health, safety and welfare by establishing and operating a comprehensive approach to surface and storm water problems which would reduce flooding, erosion and sedimentation, prevent and mitigate habitat loss, enhance groundwater recharge and prevent water quality degradation. This comprehensive approach includes the following elements: basin and subbasin planning, land use regulation, construction of facilities, maintenance, public education, and provision of surface water management services. The most cost effective and beneficial approach to surface water management is through preventative actions and protection of the natural drainage system. In approaching surface water problems the surface water management program shall give priority to methods which provide protection or enhancement of the natural surface water drainage system, such as LID BMPs and principles which promote infiltration and dispersion, over ~~means~~ methods which primarily involve construction of ~~new-traditional~~ drainage facilities or systems, such as detention pipes, vaults, and ponds. The purpose of the rates and charges established at SMC 12.10.225 is to provide a method for payment of all or any part of the cost and expense of surface water management services or to pay or secure the payment of all or any portion of any issue of general obligation or revenue bonds issued for such services and facilities. These rates

and charges are necessary in order to promote the public health, safety and welfare by minimizing uncontrolled surface and storm water, erosion, and water pollution; to preserve and utilize the many values of the City's natural drainage system including water quality, open space, fish and wildlife habitat, recreation, education, urban separation and drainage facilities; and to provide for the comprehensive management and administration of surface water.

C. The following sections of Chapter 9.08 King County Code as now in effect, and as may be subsequently amended, are adopted by reference, except that, unless the context indicates otherwise, the word "County" and the words "King County" shall refer to the City, and references to County codes shall be deemed references to the Surface Water Design Manual or Municipal Code, as applicable:

9.08.060(B) through (L)

and (N) through (Q)        Policy.

9.08.090                      Billing procedure.





**FINAL DRAFT**  
**Addendum to  
the King County  
Surface Water Design Manual**

**Effective date**  
**~~February 15, 2010~~ January 1, 2017**

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## Acknowledgements

The City of SeaTac gratefully acknowledges the contributions the City of Federal Way has made in the development of this document.

# Introduction

This addendum to the [2009-2016](#) King County Surface Water Design Manual (KCSWDM) applies to development and redevelopment proposals within the City of SeaTac (City). The KCSWDM has been adopted to meet the requirements of the Clean Water Act, the Endangered Species Act and State Growth Management Act. This addendum includes minor revisions to the KCSWDM to address the differences between King County's and the city's organization and processes, as well as to address equivalency requirements. No major substantive changes have been made to the KCSWDM in order to maintain equivalency in review requirements and level of protection provided by the manual.

[**Note:** Clarifications and interpretations to the KCSWDM or this addendum will be documented and made available through policy statements within the City's Development Standards.]

## Addendum Organization

The information presented in this addendum is organized as follows:

- **Terminology:** At times King County and City of SeaTac use different terminology to describe or refer to equivalent subject matter. This section identifies these terms and the City of SeaTac's equivalent terminology.
- **Key Revisions:** This section specifically identifies the minor revisions the City has made to the KCSWDM. These revisions are necessary to maintain equivalency to the stormwater standards identified in the NPDES Phase II Permit, as well as to address deficiencies within the KCSWDM.
- **Supplemental [Manuals Documents](#):** This section identifies technical guidance manuals [and documents](#) which shall be used to supplement the KCSWDM. These [manuals documents](#) are necessary to maintain equivalency to the stormwater standards identified in the NPDES Phase II Permit, as well as to address deficiencies within the KCSWDM.
- **Code Reference Tables:** King County code is referenced in many places throughout the KCSWDM. This section identifies these code references and equivalent city code where applicable.
- ~~**Reference Materials:** This section identifies which reference materials provided in the KCSWDM are applicable and which are not. It also identifies if equivalent City of SeaTac reference materials are available. This section also includes supporting documentation.~~
- ~~**Mapping:** City of SeaTac equivalents to the Flow Control Applications Map and the Water Quality Applications Map are included in this section.~~

[Supplemental information in the appendices includes the following:](#)

- [Appendix A: Hydrologic Analysis of the Des Moines Creek Regional Detention Facility \(July 23, 2003 Memorandum from the Department of Ecology\)](#)
- [Appendix B: Soil Amendment Requirements](#)
- [Appendix C: Design and Maintenance Criteria for BMPs/Facilities not included in the KCSWDM](#)
- [Appendix D: Flow Control and Water Quality Applications Maps](#)

## Terminology

At times King County and City of SeaTac use different terminology to describe or to refer to equivalent subject matter. This section identifies these terms and the City of SeaTac's equivalent terminology.

~~Department of Development and Environmental Services (DDES) = City of SeaTac Public Works and Planning & Community Development Departments.~~

**Department of Natural Resources and Parks (DNRP)** = City of SeaTac [Parks & Recreation Department of Planning and Community Development Services.](#)

[Department of Permitting and Environmental Review \(DPER\) = City of SeaTac Public Works and Community and Economic Development Departments.](#)

**Director** = City of SeaTac Public Works Director.

**Drainage facilities restoration and site stabilization guarantee and drainage defect and maintenance guarantee** = SeaTac [stormwater facilities restoration and site stabilization bond \(Performance Bond\) and defect and maintenance bond/ \(Stormwater Maintenance Bond\).](#)

**King County** = City of SeaTac.

**King County Code (KCC)** = SeaTac Municipal Code (SMC). Check code reference table for equivalent code sections.

**King County Designated/Identified Water Quality Problem** - This determination is made on a case-by-case basis.

**King County Road Standards** = City of SeaTac Development Standards.

**Master Drainage Planning** - Not applicable, no SMC equivalent.

**Sensitive Area Folio** = In addition to the King County Sensitive Area Folio, Stream, Wetland and Steep Slope maps are also available on the [Planning and Community Development Department of Community and Economic Development](#) web page at

[www.ci.seatac.wa.us/departments/planning/home](http://www.ci.seatac.wa.us/departments/planning/home)<http://www.ci.seatac.wa.us/index.aspx?page=42>  
under Planning maps.

**Urban Planned Development** = Not applicable, no SMC equivalent.

**Water and Land Resources (WLR) Division** = City of SeaTac ~~Stormwater Compliance and Engineering Divisions~~[Public Works Department](#).

**Zoning Classifications:** Where the KCSWDM references **Agricultural (A) Zoning, Forest (F) Zoning, or Rural (R) Zoning** - These zoning classifications are intended for areas outside of the Urban Growth Boundary, therefore the City of SeaTac contains no equivalent zoning. Refer to City zoning maps to determine which zoning classifications apply to your project.

# Key Revisions

This section specifically identifies the minor revisions the City has made to the KCSWDM. These revisions are necessary to maintain equivalency to the stormwater standards identified in the NPDES Phase II Permit, as well as to address deficiencies within the KCSWDM.

**Mitigation of Impacts from Construction Site Runoff** – Property owners and construction site managers are responsible for mitigating off-site impacts from construction regardless of the size of the project or whether a construction permit was required by the City of SeaTac.

**Des Moines Creek Basin Flow Control** – New and redevelopment projects may use the Basic Flow Control standard as identified in the KCSWDM, and the 1994 land use condition as the pre-development conditions for sizing flow control facilities. This adjustment is established based on the Des Moines Creek Basin Plan, the Des Moines Creek Regional Capital Improvement Project and the Hydrologic Analysis of the Des Moines Creek Regional Detention Facility as specified in a letter from the Department of Ecology, dated July 23, 2003 signed by Kevin Fitzpatrick (included in [Appendix A Reference Section](#)).

**Soil Amendment Requirements** – [The City has developed a Soil Amendment Standards handout that is included in Appendix B of this document.](#)~~In the absence of City of SeaTac standards for the preservation of duff soil layers and specific soil amendment requirements, the City will rely on King County standards established in King County Clearing and Grading Code sections KCC 16.82.100(F) & (G) included in Reference Section.~~

~~**Impervious Surface Percentage Exemption** – This exemption, which is listed in 1.2.3 of the KCSWDM, is not allowed within the City of SeaTac in order to maintain equivalency with the 2005 Stormwater Management Manual for Western Washington (DOE Manual).~~

~~**Flow Control**~~**Continuous Modeling for LID BMPs** – Neither the KCSWDM, nor the 2005 Low Impact Development (LID) Technical Guidance Manual fully address how infiltration rates shall be included in flow control modeling for all low impact development BMPs. ~~In an effort to encourage the use of LID techniques~~ SeaTac will allow the Western Washington Hydrology Model (WWHM), MGSFlood, or HSPF to be used to determine for sizing stormwater facilities to meet flow control, treatment, or the LID performance standard requirements for projects containing LID BMPs, until the KCSWDM had been updated to adequately address infiltration rates. Explicit modeling of BMP infiltration for facility sizing is also allowed instead of applying the flow control BMP facility sizing credits included in Table 1.2.9.A in Chapter 1 of the KCSWDM.

**Additional Flow Control Facility Options for Core Requirement #3** – The KCSWDM does not include vegetated roofs, but they are allowed in the City of SeaTac. Design and maintenance guidelines for vegetated roofs can be found in Appendix C of this document

**Additional Water Quality Facility Options for Core Requirement #8** – The following facilities are available as options on the Basic WQ Menu: Compost-amended Vegetated Filter Strips (CAVFS), Media Filter Drains (MFDs) (previously referred to as the Ecology Embankment), and Bioretention.

Emerging technologies currently approved by Ecology (<http://www.ecy.wa.gov/programs/wq/stormwater/newtech/technologies.html>) can be used as options on the Basic WQ Menu if they have received a General Use Level Designation (GULD) for Basic Treatment. Emerging technologies currently approved by Ecology can be used as options on the Enhanced WQ Menu if they have received a GULD for Enhanced Treatment.

Design and maintenance guidelines for CAVFS and MFDs can be found in Appendix C of this document. Design guidelines for Bioretention can be found in Appendix C of this document. Maintenance guidelines for Bioretention can be found in the KCSWDM. Design and maintenance guidelines for emerging technologies should be requested from the manufacturer.

**Additional Flow Control BMP Options for Core Requirement #9** – In addition to engineered bioretention facilities, non-engineered rain gardens are allowed for small lots in the City of SeaTac with less than 5,000 square feet of impervious surface. Rain gardens shall be sized to have a minimum horizontal projected surface area below the overflow which is at least 5% of the area draining to it. Design and maintenance guidelines for rain gardens can be found in the Rain Garden Handbook for Western Washington. [Note: Rain gardens can be used to meet Core Requirement #9, but cannot be used to meet Core Requirements #3 or #8.]

**Overflows to City ROW** – Where feasible based on topography, private stormwater facilities should be designed to overflow to the City Right-of-Way (ROW) or a receiving water.

**Underdrains** – Underdrains are allowed in permeable pavement designs. No underdrains are allowed for bioretention until a new bioretention soil mix has been approved by Ecology and King County.

**Flow Control and Water Quality Applications Maps** – City of SeaTac equivalents to the Flow Control Applications Map and Water Quality Applications Map can be found in Appendix D of this document. In lieu of a SeaTac equivalent to the County Landslide Hazard Drainage Areas Map, the City will rely on King County's map.

## Supplemental ~~Manuals~~ Documents

This section identifies technical guidance manuals and documents which shall be used to supplement the KCSWDM. These ~~manuals~~ documents are necessary to maintain equivalency to the stormwater standards identified in the NPDES Phase II Permit, as well as to address deficiencies within the KCSWDM.

**King County Stormwater Pollution Prevention Manual** – The most recent edition of the King County Stormwater Pollution Prevention Manual (KCSWPPM) shall be used as technical guidance for water quality best management practices (BMPs). This BMP manual shall also be used as the technical guidance for identifying and implementing source control measures for private residents, businesses, and industries when applying SMC 12.12 (Surface and Stormwater – Illicit Discharge Detection and Elimination Code).

**Low Impact Development Technical Guidance Manual for Puget Sound** – The ~~2005-2012~~ Low Impact Development Technical Guidance Manual for Puget Sound created by the Puget Sound ~~Action Team~~ Partnership, or as hereafter amended, shall be used as the supplemental technical guidance for the KCSWDM for the use of LID ~~techniques~~ principles and LID BMPs. ~~See the City of SeaTac Development Standards for clarification on the limitations of use for the different LID techniques within the City.~~

**Rain Garden Handbook for Western Washington: A Guide for Design, Installation, and Maintenance** - The 2013 Rain Garden Handbook created by Ecology, the Washington State University Extension, and Kitsap County, or as hereafter amended, shall be used as the supplemental technical guidance for the KCSWDM for the design, installation, and maintenance of rain gardens.

**Stormwater Standard Plans** – The City of Tacoma Standard Plans currently found at [www.cityoftacoma.org/government/city\\_departments/public\\_works/engineering/city\\_of\\_tacoma\\_right\\_of\\_way\\_design\\_manual](http://www.cityoftacoma.org/government/city_departments/public_works/engineering/city_of_tacoma_right_of_way_design_manual) are approved by the City of SeaTac on a conceptual basis. City of SeaTac development review staff will work with applicants to review and implement these standard details.

**Stormwater System Maintenance Standards** – The Maintenance Standards for both public and private stormwater systems are identified in Chapter 6, ~~and~~ Appendix A, and Appendix C of the KCSWDM and Appendix C of this document.

**Operations and Maintenance Standards** Supplemental Guidelines for Public Right of Way Operations and Maintenance – The most recent edition of the Regional Road Maintenance - Endangered Species Act Program Guidelines currently found at <http://www.kingcounty.gov/transportation/cedot/Roads/environment/RegionalRoadMaintenanceESAGuidelines/ESAProgramGuidelines.aspx> [www.kingcounty.gov/depts/transportation/roads/endangered-species-act-reports.aspx](http://www.kingcounty.gov/depts/transportation/roads/endangered-species-act-reports.aspx), or as hereafter amended, shall be used to supplement the above mentioned stormwater system maintenance standards for work done in the public right of way, as well as public stormwater systems.



**Supplemental Snow and Ice Policy** – The City of SeaTac ~~shall~~will use snow melt materials (i.e., salt brine) as often as necessary on public roads during snow and ice events ~~in an effort to maintain safe travel on roadways while public safety and commerce.~~ ~~Snow melt materials shall be applied as often as necessary, to the minimum extent necessary in an effort to minimize~~ing the potential of water quality impacts (i.e., debris entering the storm system).

**Vegetation and Land Management Standards** - The most recent edition ~~of the~~ City of SeaTac Integrated Pest and Vegetation Management Plan shall be used as guidance for pest, vegetation and land management activities for all properties or facilities owned or operated by the City of SeaTac.

# Code Reference Tables

King County Code is referenced in many places throughout the KCSWDM. The following tables identify these code references and equivalent city code where applicable.

King County Code to SeaTac Municipal Code (SMC) Reference Table			
King County Code Reference	Subject of Reference	SMC Equivalent	Comment
KCC 2.98	Adoption Procedures	1.01	
KCC 2.98	Critical Drainage Areas (CDAs), adoption procedures	12.10.080	
Title 9	Surface Water Management	12.10 & 12.30	
KCC 9.04	Surface Water Run-off Policy: Variances	No Equivalent	The City relies on the adjustment process identified in the KCSWDM
<a href="#">KCC 9.04</a>	<a href="#">Stormwater Runoff and Surface Water and Erosion Control</a>	<a href="#">No Equivalent</a>	<a href="#">In the absence of equivalent SMC, the City will use the King County Code for all general references to KCC 9.04</a>
KCC 9.04.030	Definitions: Targeted Drainage Review/abbreviated evaluation	No Equivalent	In the absence of equivalent SMC, the City will use King County's definition
KCC 9.04.030	Drainage review <a href="#">– when required - type</a>	No Equivalent	In the absence of equivalent SMC, the City will use King County's definition
KCC 9.04.030	<a href="#">Large-Project</a> Full Drainage Review	No Equivalent	The SMC does not list additional drainage review requirements and relies on the KCSWDM
KCC 9.04.050	Drainage review - requirements	No Equivalent	The SMC does not list additional drainage review requirements and relies on the KCSWDM
KCC 9.04.070	Engineering plans for the purposes of drainage review	Not Applicable	County Code refers to internal DDES procedures and is referenced only in definition of DDES
KCC 9.04.090	Construction timing and final approval	12.10.100	<a href="#">The City also has Subdivision Standard Plan Notes</a>

## King County Code to SeaTac Municipal Code (SMC) Reference Table

King County Code Reference	Subject of Reference	SMC Equivalent	Comment
9.04.100	Liability <del>Requirements</del> <u>insurance required</u>	12.10.110 - 12.10.150	
KKCC 9.04.115	Drainage facilities accepted by King County <u>for maintenance</u>	No Equivalent	SeaTac generally does not accept stormwater facilities unless they are constructed in the public ROW
KCC 9.04.120	Drainage facilities <u>not</u> accepted by King County <u>for maintenance</u>	No Equivalent	SeaTac generally does not accept stormwater facilities unless they are constructed in the public ROW
K.C.C. 9.05.050	Drainage review - requirements	Not Applicable	King County Code section does not exist. Presumed typo. See KCC 9.04.050
KCC 9.12. <u>025</u>	Prohibited, <u>allowable, and conditional</u> discharges <del>in the Water Quality Section</del>	12.12. <u>020, 12.12.030, and 12.12.040</u>	
KCC 9.12	Water Quality	<del>42.12</del> <u>No Equivalent</u>	In the absence of equivalent SMC, the City will use the King County Code for all general references to KCC 9.12
KCC 9.12. <u>035</u>	<del>Water Quality</del> : Stormwater Pollution Prevention Manual <u>Adoption</u>	No Equivalent	Adopted via SeaTac Addendum to KCSWDM
<u>Title 10</u>	<u>Seattle-King County Department of Public Health solid waste regulations</u>	<u>7.40</u>	
KCC 16.62	Erosion and Sediment Control	Not Applicable	King County Code section does not exist. Presumed typo. See KCC 16.82 below.
KCC 16.82	Clearing and Grading Code: Bridge Design	No Equivalent	In the absence of City standards for bridge design, the City will rely on King County <u>Road Design and Construction standards and the WSDOT Standard Specifications for Road, Bridge, and Municipal Construction</u>
KCC 16.82	Clearing and Grading Code: Clearing Limit	<del>13.190.150</del> <u>No Equivalent</u>	<u>In the absence of City standards for clearing limits, the City will rely on King</u>

## King County Code to SeaTac Municipal Code (SMC) Reference Table

King County Code Reference	Subject of Reference	SMC Equivalent	Comment
			<a href="#">County standards.</a>
<a href="#">KCC 16.82.095(A)</a>	<a href="#">Erosion and sediment control standards</a>	<a href="#">No Equivalent</a>	<a href="#">In the absence of City standards for seasonal construction limitations, the City will rely on King County standards</a>
KCC 16.82.095(A)	Erosion and sediment control standards-seasonal limitation period	No Equivalent	In the absence of City standards for seasonal construction limitations, the City will rely on King County standards
KCC 16.82.100(F)	Grading Standards: Preservation of Duff Layer	No Equivalent	<a href="#">Appendix B of this addendum includes the City's Soil Amendment requirements. In the absence of City standards for preservation of the duff layer, the City will rely on King County standards</a>
KCC 16.82.100(G)	Grading Standards: Soil Amendments	No Equivalent	<a href="#">Appendix B of this addendum includes the City's Soil Amendment requirements. In the absence of City standards for soil amendments, the City will rely on King County standards</a>
KCC 16.82.150	Clearing standards for individual lots in the rural zone	Not Applicable	SMC does not contain rural zoning classification
KCC 16.82.150 (C)	Clearing standards for individual lots in the rural zone	Not Applicable	SMC does not contain rural zoning classification
<a href="#">KCC 16.85</a>	<a href="#">Clearing and Grading Code: Flood protection facilities</a>	<a href="#">Not Applicable</a>	<a href="#">King County Code section does not exist. Presumed typo. See KCC 16.82 below.</a>
KCC 20.20 <a href="#">or Title 20.20</a>	Land Use Review Procedures	16A	
<a href="#">KCC 20.70.020</a>	<a href="#">Critical aquifer recharge area map adoption</a>	<a href="#">15.700</a>	

## King County Code to SeaTac Municipal Code (SMC) Reference Table

King County Code Reference	Subject of Reference	SMC Equivalent	Comment
KCC 21A <del>or Title 21A</del>	Critical Areas Requirements	<del>15.30</del> 15.700	
<del>KCC 21A</del>	<del>Definitions: Critical Aquifer Recharge Area</del>	<del>15.30.370</del>	
KCC 21A.06	Definitions: Erosion Hazard Area	<del>15.10.245</del> 15.700	
KCC 21A.06	Definitions: Flood Hazard Area	<del>15.700</del> 15.10.267	
KCC 21A.06	Definitions: Landslide Hazard Area	No Equivalent	SMC does not contain an equivalent definition
KCC 21A.06	Definitions: Steep Slope Hazard Area	<del>15.700</del> 15.10.613	
KCC 21A.06	Definition: Structure	<del>15.700</del> 15.10.631	
KCC 21A.06	<del>Definitions:</del> Critical Aquifer Recharge Area	<del>15.700</del> 15.30.370	
<del>KCC 21A.06</del>	<del>Definitions: Flood, Erosion, Steep Slope Hazard Areas</del>	<del>15.10</del>	
<del>KCC 21A.06</del>	<del>Definitions: Flood Hazard Area</del>	<del>15.10.267</del>	
KCC 21A.06	Definitions: (Nonconversion) Forest Practices	Not Applicable	City of SeaTac only reviews Type IV - Conversion, forest practice permits
K.C.C. 21A.06.1340	Urban planned development land use designation	Not Applicable	SMC contains no equivalent comprehensive plan land use designation
KCC 21A.08	Definitions: Land Zoned for Agriculture (A zoned lands)	Not Applicable	SMC does not contain agricultural zoning classification

## King County Code to SeaTac Municipal Code (SMC) Reference Table

King County Code Reference	Subject of Reference	SMC Equivalent	Comment
KCC 21.A12	Definitions: Urban Residential Development	<del>Not Applicable</del> <a href="#">15.200</a>	<a href="#">The City of SeaTac Zoning Map contains Urban Low Density Residential (UL), Urban Medium Density Residential (UM), and Urban High Density Residential (UH). SMC contains no equivalent comprehensive plan land use designation</a>
KCC 21A.12.030	Impervious Surface Coverage	<del>15.400.015</del> <a href="#">15.43.111</a>	<a href="#">Only one zone in the City (Business Park [BP]) contains a maximum impervious surface coverage development standard</a>
KCC 21A.12.030	Impervious Surface Coverage for Residential Subdivisions	<del>Not Applicable</del> <a href="#">15.15.180</a>	<a href="#">The City does not have impervious surface coverage development standards for residential subdivisions</a>
KCC 21A.14.180	Onsite recreational space	<del>15.510.500 – 15.510.560</del> <a href="#">15.19.500, 15.23.350, 15.35.400, 15.38.500, 15.39.400 &amp; 14.21.010(E)</a>	<a href="#">The City allows vegetated roofs that are accessible to the general public and permeable pavement trails to count towards multi-purpose outdoor recreation and open space</a>
KCC 21A.14.180.D	21A.14.180 On-site recreation - space required.	<del>15.510.510</del> <a href="#">15.19.500, 15.23.350, 15.35.400, 15.38.500, 15.39.400 &amp; 14.21.010(E)</a>	<a href="#">The City allows vegetated roofs that are accessible to the general public and permeable pavement trails to count towards multi-purpose outdoor recreation and open space</a>
KCC 21A.24	Critical Areas Code: 100-Year Floodplain	<del>15.700</del> <a href="#">15.30.210</a>	
KCC 21A.24	Critical Areas Code: Bridge Design	No Equivalent	<a href="#">In the absence of City standards for bridge design, the City will rely on King County Road Design and Construction standards and the WSDOT Standard Specifications for Road, Bridge, and Municipal Construction</a>

## King County Code to SeaTac Municipal Code (SMC) Reference Table

King County Code Reference	Subject of Reference	SMC Equivalent	Comment
KCC 21A.24	Critical Areas Code: Bridge pier and abutment locations	No Equivalent	In the absence of City standards for bridge and pier location, the City will rely on King County <a href="#">Road Design and Construction standards and the WSDOT Standard Specifications for Road, Bridge, and Municipal Construction</a>
<a href="#">KCC 21A.24</a>	<a href="#">Critical Areas Code: Critical Area Buffers</a>	<a href="#">15.700</a>	
KCC 21A.24	Critical Areas Code: Building Setbacks	<del>15.30.190</del> <a href="#">15.700</a>	
KCC 21A.24	Critical Areas Code: Channel Migration Zone	No Equivalent	In the absence of City standards for channel migration zones, the City will rely on King County standards
KCC 21A.24	Critical Areas Code: Definition Streams	<del>15.10.620</del> <a href="#">15.700</a>	
<a href="#">KCC 21A.24</a>	<a href="#">Critical Areas Code: Requirements of crossing streams</a>	<a href="#">15.700</a>	
KCC 21A.24	Critical Areas Code: Definition Wetlands/Wetland Soils	<del>15.10.675</del> <a href="#">15.700</a>	
KCC 21A.24	Critical Areas Code: Fish Passage Requirements	<del>15.30.350</del> <a href="#">15.700</a>	
KCC 21A.24	Critical Areas Code: Flood Hazard Area regulations	<del>15.30.200– 15.30.250</del> <a href="#">15.700</a>	
KCC 21A.24	Critical Areas Code: Floodplain/Floodway Delineation	<del>15.30.200– 15.30.250</del> <a href="#">15.700</a>	
KCC 21A.24	Critical Areas Code: Floodplain Data	<del>15.30.200– 15.30.250</del> <a href="#">15.700</a>	
KCC 21A.24	Critical Areas Code: Flood Protection facility	No Equivalent	In the absence of City standards for flood protection facilities, the City will rely on King County standards

## King County Code to SeaTac Municipal Code (SMC) Reference Table

King County Code Reference	Subject of Reference	SMC Equivalent	Comment
KCC 21A.24	Critical Areas Code: Notice on Title	<del>45.30.170</del> <a href="#">15.700</a>	
KCC 21A.24	Critical Areas Code: Regulation of Wetlands	<del>45.30.290</del> <del>45.30.330</del> <a href="#">15.700</a>	
KCC 21A.24	Critical Areas Code: zero-rise and compensatory storage provisions	<del>No Equivalent</del> <a href="#">15.700</a>	In the absence of City standards for zero-rise and compensatory storage, the City will rely on King County standards
KCC 21A.24	Definitions: Critical Area Ordinance (CAO)	<del>45.30</del> <a href="#">15.700</a>	See - Environmentally Sensitive Areas Code
KCC 21A.24	Farm Management Plans	Not Applicable	The City does not have Farm Management Plan code.
KCC 21A.24	Floodplain Development Standards: Bridges	No Equivalent	In the absence of City standards for bridge design, the City will rely on King County <a href="#">Road Design and Construction</a> standards and <a href="#">the WSDOT Standard Specifications for Road, Bridge, and Municipal Construction</a>
<del>KCC 21A.24</del>	<del>Notice on Title: Erosion Hazard Areas</del>	<del>45.30.170</del>	
KCC 21A.24, <a href="#">KCC 16.82</a>	Rural Stewardship Plan or Farm Management Plan	Not Applicable	<del>The City does not have Rural Stewardship Plan code.</del>
KCC 21A.24	Sensitive Area	<del>45.10.564</del> <a href="#">15.700</a>	
KCC 21A.24	Sensitive Area Tract	<del>15.700</del> <del>45.30.180</del>	
KCC 21A.24.100	Critical Area Review	<del>15.700</del> <del>45.30.100</del>	
KCC 21A.24.110	Critical Area Reports	<del>15.700</del> <del>45.30.110</del> - <del>45.30.120</del>	
KCC 21A.24.170	Notice on Title	<del>15.700</del> <del>45.30.170</del>	



## King County Code to SeaTac Municipal Code (SMC) Reference Table

King County Code Reference	Subject of Reference	SMC Equivalent	Comment
KCC 21A.24.230	Floodplain and Flood Hazard Areas	<del>15.70015.30.240–15.30.250</del>	
KCC 21A.24.270	<del>Notice on Title</del> FEMA Elevation Certification	<del>15.70015.30.170</del>	
KCC 21A.24.275	channel migration zone development standards	<del>Not ApplicableNo Equivalent</del>	<del>In the absence of City standards for development in the channel migration zone, the City will rely on King County standards</del>
<del>KCC 21A.25</del>	<del>Shorelines code</del>	<del>Title 18</del>	
<del>K.C.C. 21A.38</del>	<del>Property-specific development standards or special district overlays</del>	<del>15.28</del>	
<del>K.C.C. 23.20</del>	<del>Code Compliance: Citations</del>	<del>1.15.065</del>	
<del>K.C.C. 23.24</del>	<del>Code Compliance: Notice and Orders</del>	<del>1.15.120–1.15.140</del>	
<del>K.C.C. 23.28</del>	<del>Code Compliance: Stop Work Orders</del>	<del>1.15.120–1.15.140</del>	
<del>KCC 23.40</del>	<del>Code Compliance: Liens references on declaration of covenants form</del>	<del>1.15.200</del>	
KCC 25 <del>or Title 25</del>	Shoreline Management: Bridge Design	<del>No EquivalentNot Applicable</del>	In the absence of City standards for bridge design, the City will rely on King County standards

## Reference Materials

This section identifies which reference materials provided in the 2009 KCSWDM are applicable and which are not. It also identifies if equivalent City of SeaTac reference materials are available.

### Notes:

*Reference materials that have been struck through (i.e. struck through) are not applicable to projects in the City of SeaTac.*

*Reference materials that have been struck through and highlighted (i.e. struck through and highlighted) are not applicable, however equivalent City of SeaTac documents are available through the Public Works Department, Development Services Se*

**1. ~~KCC 9.04 – Surface Water Runoff Policy~~**

**2. ~~Adopted Critical Drainage Areas~~**

**3. ~~Other Adopted Area Specific Drainage Requirements~~**

- ~~A. RA Zone Clearing Restrictions~~

**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 Guidance~~

**5. ~~Wetland Hydrology Protection Guidelines~~**

**6. ~~Hydrologic/Hydraulic Design Methods~~**

- ~~A. EPA Infiltration Rate Test~~
- ~~B. Pond Geometry Equations~~

**7. ~~Engineering Plan Support~~**

- ~~A. King County Standard Map Symbols~~
- ~~B. Standard Plan Notes and Example Construction Sequence~~
- ~~C. Stormfilter 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. CSWPPP Worksheet Forms~~
- ~~F. Adjustment Application 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. Flow Control BMP Covenant~~
- ~~N. Impervious Surface Limit Covenant~~
- ~~O. Clearing Limit Covenant~~
- ~~P. River Protection Easement~~
- ~~Q. Leachable Metals Covenant~~

**9. ~~Interim Changes to Requirements~~**

**10. ~~King County Identified Water Quality Problem~~**



**Appendix A – Hydrologic Analysis of the Des Moines  
Creek Regional Detention Facility (July 23, 2003  
Memorandum from the Department of Ecology)**

**~~Additional Reference Materials~~**





STATE OF WASHINGTON  
DEPARTMENT OF ECOLOGY

Northwest Regional Office • 3190 160th Avenue SE • Bellevue, Washington 98008-5452 • (425) 649-7000

July 23, 2003

Mr. David Masters, Project Coordinator  
Des Moines Creek Regional Detention Facility Planning Committee  
P.O. Box 4008  
Seattle, WA 98194

Dear Mr. Masters;

Re: Hydrologic Analysis of the Des Moines Creek Regional Detention Facility

We have reviewed the following reports submitted by you on behalf of the members of the Des Moines Creek Planning Committee:

- *Hydrologic Analysis of the Des Moines Creek Regional Detention Facility Using HSPF*
- *Des Moines Creek Regional Capital Improvement Project, Preliminary Design Report (including the Alternatives Analysis, Alternative Analyses Addendum, and Appendices A, B, D, and E).*
- *Des Moines Creek Basin Plan*

We find that these documents are responsive to the Department of Ecology's *Stormwater Management Manual for Western Washington, Appendix A, Guidance for Altering the Minimum Requirements Through Basin Planning*. The information submitted provides sufficient technical data to justify an alternative to the department's recommended minimum requirement for flow control within the Des Moines Creek Watershed. The alternative receiving the department's concurrence requires the implementation of three recommendations from the subject reports:

- A Des Moines regional detention facility in the Tyee Golf Course at the southern end of Sea-Tac airport, north of South 200<sup>th</sup> St., including two new stormwater detention ponds referred to as the Northwest Pond and the Approach Light Road Pond, as further described in the documents.
- Two bypass pipelines; a 48-inch diameter line to carry flow from the existing Tyee Regional Stormwater Pond to the Northwest Pond, and a 30-inch diameter line from the Tyee Pond to an abandoned sanitary sewer line that will be refurbished to carry stormwater to Puget Sound.

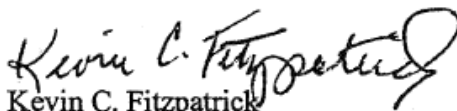
- Application of the King County Runoff Time Series (KCRTS) flow model or other DOE approved models, the King County Level 1 flow control standard, and the 1994 land use condition as the pre-developed condition for sizing flow control facilities for new development and redevelopment once the regional facilities and bypass lines are constructed and operational.

This concurrence should not be construed as the issuance of the necessary permits for construction of the above projects.

Because the planning documents do not provide alternative recommendations to the water quality treatment guidance provided in the 2001 Stormwater Management Manual for Western Washington, the Department of Ecology encourages the local governments to use the manual recommendations for new development and redevelopment. In addition, the Department encourages the Basin Committee to continue planning to address the existing water quality problems of the creek. The chemical parameters identified in the planning documents that exceed applicable water quality standards include: fecal coliform bacteria, temperature, dissolved copper and zinc. In addition, because of the relatively urbanized nature of the watershed, it is likely that concentrations of various polycyclic aromatic hydrocarbons and pesticides are periodically problematic.

We congratulate the local governments on their foresight, determination, and commitment to identify and implement a strategy that should give Des Moines Creek and its biologic resources a much improved chance at not only surviving, but thriving.

Sincerely,

  
Kevin C. Fitzpatrick  
Water Quality Manager  
Northwest regional Office

KCF:ha:jc

Cc: Donald Althausen, P.E., King County  
Ed O'Brien, P.E., DOE, Water Quality, HQ  
Ed Abbasi, Water Quality, NWRO



## Appendix B – Soil Amendment Requirements

### **Soil Amendment Requirements**

**[King County Clearing and Grading Code 16.82.100 (F) & (G)]**

~~F. The duff layer and native topsoil shall be retained in an undisturbed state to the maximum extent practicable. Any duff layer or topsoil removed during grading shall be stockpiled on site in a designated, controlled area not adjacent to public resources and critical areas. The material shall be reapplied to other portions of the site where feasible.~~

~~G.1. Except as otherwise provided in subsection G.2. of this section, areas that have been cleared and graded shall have the soil moisture holding capacity restored to that of the original undisturbed soil native to the site to the maximum extent practicable. The soil in any area that has been compacted or that has had some or all of the duff layer or underlying topsoil removed shall be amended to mitigate for lost moisture holding capacity. The amendment shall take place between May 1 and October 1. The topsoil layer shall be a minimum of eight inches thick, unless the applicant demonstrates that a different thickness will provide conditions equivalent to the soil moisture holding capacity native to the site. The topsoil layer shall have an organic matter content of between five to ten percent dry weight and a pH suitable for the proposed landscape plants. When feasible, subsoils below the topsoil layer should be scarified at least four inches with some incorporation of the upper material to avoid stratified layers. Compost used to achieve the required soil organic matter content must meet the definition of "composted materials" in WAC 173-350-220.~~

~~G2. This subsection does not apply to areas that:~~

- ~~a. Are subject to a state surface mine reclamation permit; or~~
- ~~b. At project completion are covered by an impervious surface, incorporated into a drainage facility or engineered as structural fill or slope. (King County Ord. 16267 § 5, 2008: Ord. 15053 § 10, 2004: Ord. 13190 § 4, 1998: Ord. 3108 § 8, 1977: Ord. 1488 § 11, 1973).~~





# Soil Amendment

## ~~Standards~~Requirements

~~(Required as of Effective~~ February 15, 2010)  
Revised December 31, 2016

### Preserving and Restoring Healthy Soils on Site Developments

Healthy soil is vital to a clean environment and healthy landscapes. Deep soil that is rich in organic material absorbs rainwater, helps prevent flooding and soil erosion, and filters out water pollutants. Healthy soil also stores water and nutrients for plants to use in dry times, promoting healthy plants that require less irrigation, toxic pesticides, and other resources. Land development and landscaping practices can damage these valuable soil functions by removing or compacting topsoil. The result is erosion, unhealthy landscapes that are difficult and expensive to maintain, polluted water, destroyed fish habitat, and increased need for costly stormwater management structures. (King County ~~2011~~2005 "Achieving the Post-construction Soil Standard")

### Purpose

This document is intended to describe how to meet these soil amendment requirements, as well as provide clarifications and minor modifications to King County's soil amendment requirements in terms of seasonal restrictions and cash assignment requirements. [Additional guidance for this BMP can be found in \*Building Soil: Guidelines and Resources for Implementing Soil Quality and Depth BMP T5.13\* \(Stenn et al. 2012\), which is available at \[www.buildingsoil.org\]\(http://www.buildingsoil.org\).](#)



### Infeasibility Criteria

#### Exemptions:

The following portions of the project area are considered to be infeasible for soil amendment:

- Areas covered by an impervious surface, ~~or~~

- Areas incorporated into a drainage facility, ~~or~~
- Areas that are subject to a state surface mine reclamation permit
- Structural fill or engineered slopes
- Till soils with slopes greater than 33 percent

## Soil Amendment ~~Standards~~Requirements

The City of SeaTac's soil amendment ~~standards~~requirements apply to projects that:

~~As of February 15, 2010 the City of SeaTac adopted King County's soil amendment requirements (KCC 16.82.100.F & G), in the absence of City of SeaTac standards, as a part of the City's National Pollutant Discharge Elimination System (NPDES) compliance efforts. These soil standards apply to projects that:~~

1. Create 2,000 square feet or more of new impervious surface, or
2. Result in 7,000 square feet or more of land disturbing activity.

## ~~Key Requirements and Modifications of King County's Standards~~

~~KCC 16.82.100.F & G have been amended by the City of SeaTac to include the following:~~

- ~~The duff layer and native topsoil shall be retained in an undisturbed state to the maximum extent practicable. Any duff layer or topsoil removed during grading shall be stockpiled on-site in a designated, controlled area not adjacent to public resources and critical areas. The material shall be reapplied to other portions of the site where feasible.~~
- ~~Areas that have been cleared and graded shall have the soil moisture holding capacity restored to that of the original undisturbed soil native to the site to the maximum extent practicable. The soil in any area that has been compacted or that has had some or all of the duff layer or underlying topsoil removed shall be amended to mitigate for lost moisture-holding capacity.~~
- Soil amendment calculations and a site map indicating projected soil amendment areas are due at the time of project application submittal.
- Unlike King County, the City of SeaTac **does not** limit the installation of soil amendments to the growing season (May 1 – October 1). However, soil amendments, whether compost or topsoil, shall be installed in a manner that will prevent off-site impacts from construction site run-off. Further, soil amendments are subject to "Wet Season Construction" requirements (~~2009-2016~~ KCSWDM).
- Cash Assignments:
  - Owners/contractors may provide a cash assignment for soil amendments if requesting final approval between October 1 – May 1 (during the rainy season)
  - Cash assignment amounts shall equal to 150120% x (materials + labor)
  - Owners/contractors must provide documentation ensuring legal access to the site (via construction easement, condition of sale, etc.) to install soil amendments as a condition of cash assignment acceptance/approval
  - Cash assigned soil amendments shall take place ~~the~~ during the following year during the growing season (May 2 – September 30) immediately following the date of the cash assignment
  - ~~Plats/subdivision are allowed to extend the cash assignment period for single family lots (only) for one year beyond period identified above~~

- | <u>Plant Type</u>                                                                                             | <u>Soil pH Range</u> |
|---------------------------------------------------------------------------------------------------------------|----------------------|
| <u>Lawn</u>                                                                                                   | <u>5.5 to 7.5</u>    |
| <u>Shrubs (except acid-tolerant plants)</u>                                                                   | <u>5.5 to 7.0</u>    |
| <u>Acid-tolerant shrubs (rhododendrons, azaleas, mountain laurels, camellias, blueberries, native plants)</u> | <u>4.5 to 5.5</u>    |
| <u>Annual flower and vegetable gardens</u>                                                                    | <u>6.0 to 7.0</u>    |

Source: King County 2011 "Achieving Post-construction Soil Standard"

## Options for Meeting Soil Amendment StandardsRequirements (Soil Amendment Calculations)

- Turf Areas
  - Import 6.178 cubic yards compost (in accordance with 2016 KCSWDM compost specifications) per 1,000 sq. ft. of disturbed soil area
  - Spread compost evenly over the disturbed soils in a ~~2~~ 2-5-inch layer
  - Rototill compost in 12 inches deep where feasible (8 inch minimum depth)
- Planting Beds
  - Import 9.25 cubic yards compost (in accordance with 2016 KCSWDM compost specifications) per 1,000 sq. ft. of disturbed soil area
  - Spread compost evenly over the disturbed soils in a 3 inch layer
  - Rototill compost in 12 inches deep where feasible (8 inch minimum depth)

Amount of imported compost needed to amend soils on site equals the total square footage of disturbed site soils divided by 1,000 times 6.178 cubic yards.

**Example:** Single Family Home with 3,500 square feet of post construction disturbed soil  
 (3,500 square feet disturbed soils /1,000) x 6.178 cubic yard = imported compost needed  
 (3.5) x 6.178 cubic yards = imported compost needed  
2228 cubic yards = imported compost needed

Page 3  
SeaTac Soil Amendment ~~Standards~~Requirements  
~~December 31, 2016~~June 2010





## Other Soil Amendment Options

King County's soil amendment guide "Achieving the Post-construction Soil Standard" identifies ~~three~~ two additional options, which the City considers less feasible in an urban construction environment (i.e., non-native/disturbed soils, limited staging areas) and are not included in this document. However, these options are still available for projects within the City of SeaTac and can be found at: <http://your.kingcounty.gov/solidwaste/greenbuilding/documents/Post-Construction-Soil-Standard.pdf> <http://your.kingcounty.gov/ddes/forms/Is-inf-SoilPost-ConStd.pdf>. These options ~~include~~ are listed in King County's guidance document as:

- **Option 1: Leave native soil undisturbed, and protect from compaction during construction**

[**Note:** This option is only available for sites which contain previously undisturbed native soils, such as undisturbed forested lots.]

- **Native Soil: Stockpile site duff and topsoil, and reapply after grading and construction**

[**Note:** This option is only available for sites which contain previously undisturbed native soils, such as undisturbed forested lots.]

- **Option 4: Disturbed Soil: Stockpile site soil, reapply, and amend in place**

## Inspection Approval of Soil ~~Standards~~ Requirements

Soil amendments should take place at the final stage of construction, to ensure soil amendments are not damaged by construction activities. Contractors/property owners needing a soil amendment inspection should call the City at 206.973.4764 and request a Final Erosion Sedimentation Control Inspection (FESC). For single family construction call 206.973.4764. For commercial or multifamily construction call 206.973.4730.

- Call in FESC inspection after installation of soil amendments, prior to installation of landscaping.
- Provide City inspector with a site map indicating areas needing soil amendments, as well as soil amendment calculations (see [for formulas calculation examples](#) on previous pages).
- If amending soil in place, provide City inspector with copies of site specific receipts of delivered compost indicating the volume of materials delivered in cubic yards.
- If importing topsoil mix, provide City inspector with copies of site specific receipts of delivered materials indicating volumes in cubic yards and organic content of topsoil.
  - The contractor shall also provide documentation to confirm that the imported top soil is at an appropriate pH for the proposed landscaping ([refer to Table B-2](#)).
- The inspector may require random locations for test pits to be dug to confirm depths of soil amendments and scarification.
- If soil ~~standards~~ requirements have been met, the City inspector will indicate a partial approval "soil ~~standards~~ requirements met" on the Inspection Card.

### Soil pH by Plant Type

~~A nursery can provide specific information about suitable pH for landscape plants. Here are optimal soil pH ranges for various plant types:~~

~~**Lawns**—5.5 to 7.5 pH~~

~~**Shrubs (except acid-tolerant plants)**—5.5 to 7.0 pH~~

~~**Acid-Tolerant Shrubs (Rhododendrons, Azaleas, Mountain Laurels, Camellias, Blueberries, native plants)**—4.5 to 5.5 pH~~

~~**Annual Flower and Vegetable Gardens**—6.0 to 7.0 pH~~

~~(King County 2005 "Achieving Post-construction Soil Standard")~~





## **Appendix C – Design and Maintenance Criteria for BMPs/Facilities not included in the KCSWDM**

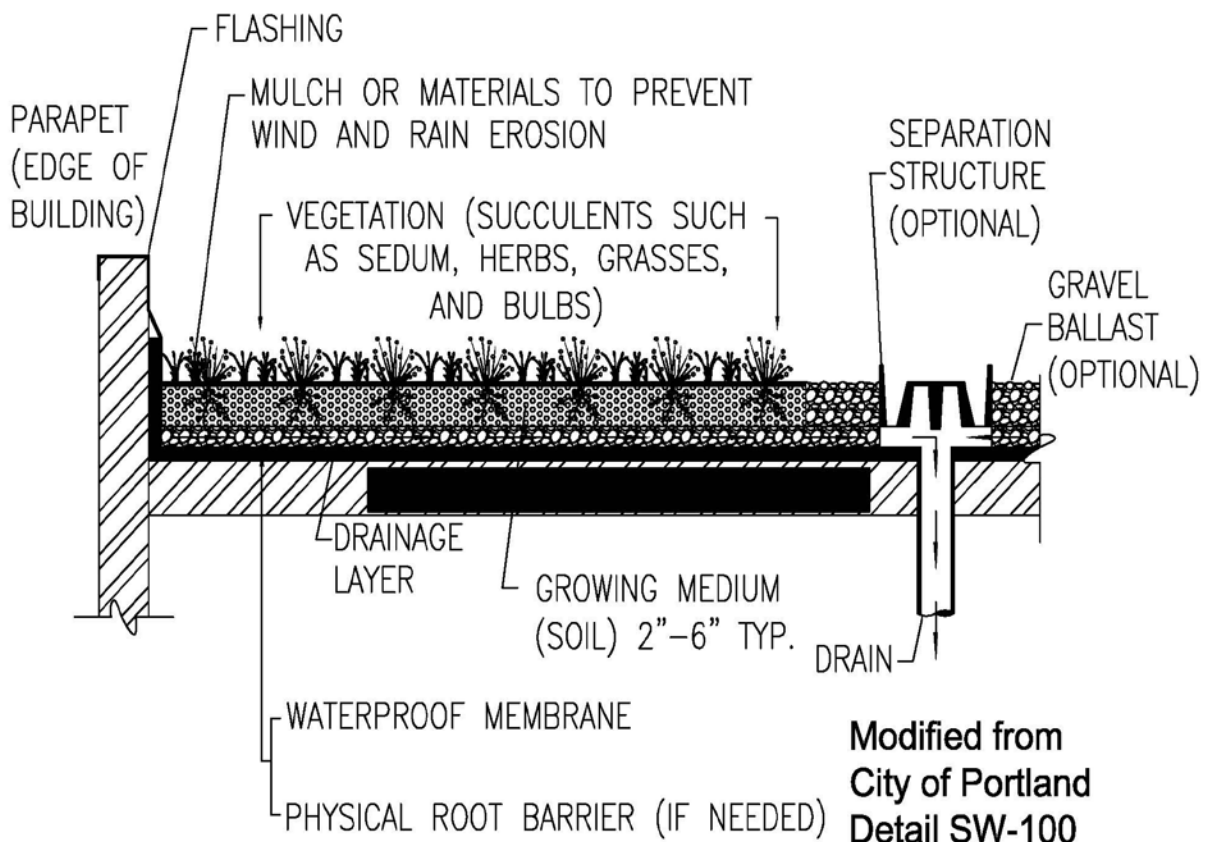


## BMP T5.17: Vegetated Roofs

### *Purpose and Definition*

Vegetated roofs (also known as ecoroofs and green roofs) are thin layers of engineered soil and vegetation constructed on top of conventional flat or sloped roofs. Vegetated roofs can provide multiple benefits, including stormwater volume reduction and flow attenuation. The range of benefits for a green roof depends on a number of design factors such as plant selection, depth and composition of soil mix, location of the roof, orientation and slope, weather patterns, and the maintenance plan.

All vegetated roofs consist of four basic components: a waterproof membrane, a drainage layer, a light-weight growth medium, and vegetation (see [Figure 5.3.7](#)). In addition to these basic components, many systems may also incorporate a protection layer and root barrier to preserve the integrity of the waterproof membrane, a separation/filter layer to stabilize fine particles, capillary mats and mulch/mats to retain moisture and prevent surface erosion due to rain and wind scour.



**Figure 5.3.7 – Example of a Vegetated Roof Section**

***Applications and  
Limitations***

While vegetated roofs can be installed on slopes up to 40 degrees, slopes between 5 and 20 degrees (1:12 and 5:12) are most suitable and can provide natural drainage by gravity. Roofs with slopes greater than 10 degrees (2:12) require an analysis of engineered slope stability.

Vegetated roofs are not included in the lists referenced under Minimum Requirement #5. However, they are an option available to project designers who want to use other methods to meet the LID Performance Standard option of Minimum Requirement #5.

***Design Criteria***

The reader is directed to the LID Technical Guidance Manual for Puget Sound (2012), for a more detailed description of the components of and design criteria for vegetated roofs. It also includes references to other sources of information and design guidance.

Note that the LID Technical Guidance Manual for Puget Sound (2012) is for additional informational purposes only. You must follow the guidance within this manual if there are any discrepancies between this manual and the LID Technical Guidance Manual for Puget Sound (2012).

***Runoff Model  
Representation***

See Appendix III-C in Volume III for a summary of how vegetated roofs may be entered into the approved continuous runoff models.

**Table 11. Maintenance Standards and Procedures for Vegetated Roofs.**

Component	Recommended Frequency <sup>a</sup>		Condition when Maintenance is Needed (Standards)	Action Needed (Procedures)
	Inspection	Routine Maintenance		
Growth medium area				
Growth medium	A <sup>b</sup>		Water does not permeate growth media (runs off soil surface) or crusting is observed	Aerate (e.g., rake) or replace medium taking care not to damage the waterproof membrane
	A		Growth medium thickness is less than design thickness (due to erosion and plant uptake)	Supplement growth medium to design thickness
	B, W		Fallen leaves or debris are present	Remove/dispose
	A, W, S		Growth media erosion/scour is visible (e.g., gullies)	<ul style="list-style-type: none"><li>Take steps to repair or prevent erosion</li><li>Fill, hand tamp, or lightly compact, and stabilize with additional soil substrate/growth medium (similar in nature to the original material) and additional plants</li></ul>
Erosion control measures	B <sup>c</sup>		Mat or other erosion control is damaged or depleted during plant establishment period	<ul style="list-style-type: none"><li>Repair/replace erosion control measures until 90% vegetation coverage attained</li><li>Avoid application of mulch on extensive vegetated roofs</li></ul>
System Drainage and Structural Components				
Roof drain	B, S		Sediment, vegetation, or debris reducing capacity of inlet structure	<ul style="list-style-type: none"><li>Clear blockage</li><li>Identify and correct any problems that led to blockage</li></ul>
	A		Pipe is clogged	Remove roots or debris
	A		Inlet pipe is in poor condition	Repair/replace

<sup>a</sup> Frequency: A = Annually; B = Biannually (twice per year); M = Monthly; W = At least once during the wet season (for debris/clog related maintenance, this visit should occur in the early fall, after deciduous trees have lost their leaves); S = Perform inspections after major storm events (24-hour storm event with a 10-year or greater recurrence interval).

<sup>b</sup> Inspection should occur during storm event.

<sup>c</sup> Inspection should occur during plant establishment period (typically first 2 years).

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**Table 11 (continued). Maintenance Standards and Procedures for Vegetated Roofs.**

Component	Recommended Frequency <sup>a</sup>		Condition when Maintenance is Needed (Standards)	Action Needed (Procedures)
	Inspection	Routine Maintenance		
System Drainage and Structural Components (cont'd)				
Border zone	A		Vegetation is encroaching into border zone aggregate	Remove and dispose of weeds and transplant desirable vegetation to growth medium area
Flashing, gravel stops, utilities, or other structures on roof	A		Flashing, utilities or other structures on roof are deteriorating (can serve as source of metal pollution in vegetated roof runoff)	Repair (e.g., recoat) or replace to eliminate potential pollutant source. Note that any work done around flashings and drains should be done with care to protect the waterproof membrane.
Access and safety	B		Insufficient egress/ingress routes and fall protection	<ul style="list-style-type: none"><li>• Maintain egress and ingress routes to design standards and fire codes</li><li>• Ensure appropriate fall protection</li></ul>
Vegetation				
Plant coverage	B		Vegetative coverage falls below 90% (unless design specifications stipulate less than 90% coverage)	<ul style="list-style-type: none"><li>• Plant bare areas with vegetation</li><li>• If necessary, install erosion control measures until percent coverage goal is attained</li></ul>
Sedums		A (first 2 years in Spring); As needed (after first 2 years)	Extensive roof with low density sedum population	<ul style="list-style-type: none"><li>• Mulch mow sedums- creating cuttings from existing plants to encourage colonization</li></ul>
Dead plants	Fall and Spring		Dead vegetation is present	Normally dead plant material can be recycled on the roof; however, specific plants or aesthetic considerations may warrant removing and replacing dead material (see manufacturer's recommendations).
Trees and shrubs–intensive vegetated roof		All pruning seasons (timing varies by species)	Pruning as needed	All pruning of mature trees should be performed by or under the direct guidance of an ISA certified arborist

<sup>a</sup> Frequency: A = Annually; B = Biannually (twice per year); M = Monthly; W = At least once during the wet season (for debris/clog related maintenance, this visit should occur in the early fall, after deciduous trees have lost their leaves); S = Perform inspections after major storm events (24-hour storm event with a 10-year or greater recurrence interval).

<sup>b</sup> Inspection should occur during storm event.

<sup>c</sup> Inspection should occur during plant establishment period (typically first 2 years).

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Table 11 (continued). Maintenance Standards and Procedures for Vegetated Roofs.				
Component	Recommended Frequency <sup>a</sup>		Condition when Maintenance is Needed (Standards)	Action Needed (Procedures)
	Inspection	Routine Maintenance		
Vegetation (cont'd)				
Fertilization– extensive vegetated roof	A		Poor plant establishment and possible nutrient deficiency in growth medium	<ul style="list-style-type: none"><li>• Allow organic debris to replenish and maintain long-term nutrient balance and growth medium structure</li><li>• Conduct annual soil test 2-3 weeks prior to the spring growth flush to assess need for fertilizer. Utilize test results to adjust fertilizer type and quantity appropriately.</li><li>• Apply minimum amount slow-release fertilizer necessary to achieve successful plant establishment.</li><li>• Apply fertilizer only after acquiring required approval from facility owner and operator. Note that extensive vegetated roofs are designed to require zero to minimal fertilization after establishment (excess fertilization can contribute to nutrient export)</li></ul>
Fertilization– intensive vegetated roof	A		Fertilization may be necessary during establishment period or for plant health and survivability after establishment	<ul style="list-style-type: none"><li>• Conduct annual soil test 2-3 weeks prior to the spring growth flush to assess need for fertilizer. Utilize test results to adjust fertilizer type and quantity appropriately.</li><li>• Apply minimum amount slow-release fertilizer necessary to achieve successful plant establishment.</li><li>• Apply fertilizer only after acquiring required approval from facility owner and operator.</li><li>• Intensive vegetated roofs may require more fertilization than extensive vegetated roofs</li></ul>

<sup>a</sup> Frequency: A = Annually; B = Biannually (twice per year); M = Monthly; W = At least once during the wet season (for debris/clog related maintenance, this visit should occur in the early fall, after deciduous trees have lost their leaves); S = Perform inspections after major storm events (24-hour storm event with a 10-year or greater recurrence interval).

<sup>b</sup> Inspection should occur during storm event.

<sup>c</sup> Inspection should occur during plant establishment period (typically first 2 years).

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**Table 11 (continued). Maintenance Standards and Procedures for Vegetated Roofs.**

Component	Recommended Frequency <sup>a</sup>		Condition when Maintenance is Needed (Standards)	Action Needed (Procedures)
	Inspection	Routine Maintenance		
Vegetation (cont'd)				
Weeds		M (March – October, preceding seed dispersal)	Weeds are present	<ul style="list-style-type: none"><li>Remove weeds with their roots manually with pincer-type weeding tools, flame weeders, or hot water weeders as appropriate</li><li>Follow IPM protocols for weed management (see “Additional Maintenance Resources” for more information on IPM protocols)</li></ul>
Noxious weeds		M (March – October, proceeding seed dispersal)	Listed noxious vegetation is present (refer to current county noxious weed list)	<ul style="list-style-type: none"><li>By law, class A &amp; B noxious weeds must be removed, bagged and disposed as garbage immediately</li><li>Reasonable attempts must be made to remove and dispose of class C noxious weeds</li><li>It is strongly encouraged that herbicides and pesticides not be used in order to protect water quality; use of herbicides and pesticides may be prohibited in some jurisdictions</li></ul>
Irrigation System (or Watering)				
Irrigation system (if any)		Based on manufacturer's instructions	Irrigation system present	Follow manufacturer's instructions for operation and maintenance
Summer watering – extensive vegetated roof		Once every 1-2 weeks as needed during prolonged dry periods	Vegetation in establishment period (1-2 years)	Water weekly during periods of no rain to ensure plant establishment (30 to 50 gallons per 100 square feet)
		As needed	Established vegetation (after 2 years)	Water during drought conditions or more often if necessary to maintain plant cover (30 to 50 gallons per 100 square feet)

<sup>a</sup> Frequency: A = Annually; B = Biannually (twice per year); M = Monthly; W = At least once during the wet season (for debris/clog related maintenance, this visit should occur in the early fall, after deciduous trees have lost their leaves); S = Perform inspections after major storm events (24-hour storm event with a 10-year or greater recurrence interval).

<sup>b</sup> Inspection should occur during storm event.

<sup>c</sup> Inspection should occur during plant establishment period (typically first 2 years).

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**Table 11 (continued). Maintenance Standards and Procedures for Vegetated Roofs.**

Component	Recommended Frequency <sup>a</sup>		Condition when Maintenance is Needed (Standards)	Action Needed (Procedures)
	Inspection	Routine Maintenance		
Irrigation System (or Watering) (cont'd)				
Summer watering – intensive vegetated roof		Once every 1-2 weeks as needed during prolonged dry periods	Vegetation in establishment period (1-2 years)	<ul style="list-style-type: none"><li>Water deeply, but infrequently, so that the top 6 to 12 inches of the root zone is moist</li><li>Use soaker hoses or spot water with a shower type wand when irrigation system not present</li></ul>
		As needed	Established vegetation (after 2 years)	Water during drought conditions or more often if necessary to maintain plant cover
Pest Control				
Mosquitoes	B, S		Standing water remains for more than 3 days after the end of a storm	<ul style="list-style-type: none"><li>Identify the cause of the standing water and take appropriate actions to address the problem (e.g., aerate or replace medium, unplug drainage)</li><li>Manually remove standing water and direct to storm drainage system</li><li>Do not use pesticides or <i>Bacillus thuringiensis israelensis</i> (Bti)</li></ul>
Nuisance animals	As needed		Nuisance animals causing erosion, damaging plants, or depositing large volumes of feces	<ul style="list-style-type: none"><li>Reduce site conditions that attract nuisance species</li><li>Place predator decoys</li><li>Follow IPM protocols for specific nuisance animal issues (see “Additional Maintenance Resources” in Bioretention Facilities section for more information on IPM protocols)</li></ul>

<sup>a</sup> Frequency: A = Annually; B = Biannually (twice per year); M = Monthly; W = At least once during the wet season (for debris/clog related maintenance, this visit should occur in the early fall, after deciduous trees have lost their leaves); S = Perform inspections after major storm events (24-hour storm event with a 10-year or greater recurrence interval).

<sup>b</sup> Inspection should occur during storm event.

<sup>c</sup> Inspection should occur during plant establishment period (typically first 2 years).

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## **BMP T7.40: Compost-amended Vegetated Filter Strips (CAVFS)**

### ***Description***

The CAVFS is a variation of the basic vegetated filter strip that adds soil amendments to the roadside embankment (See [Figure 7.4.3](#)). The soil amendments improve infiltration characteristics, increase surface roughness, and improve plant sustainability. Once permanent vegetation is established, the advantages of the CAVFS are higher surface roughness; greater retention and infiltration capacity; improved removal of soluble cationic contaminants through sorption; improved overall vegetative health; and a reduction of invasive weeds. Compost-amended systems have somewhat higher construction costs due to more expensive materials, but require less land area for runoff treatment, which can reduce overall costs.

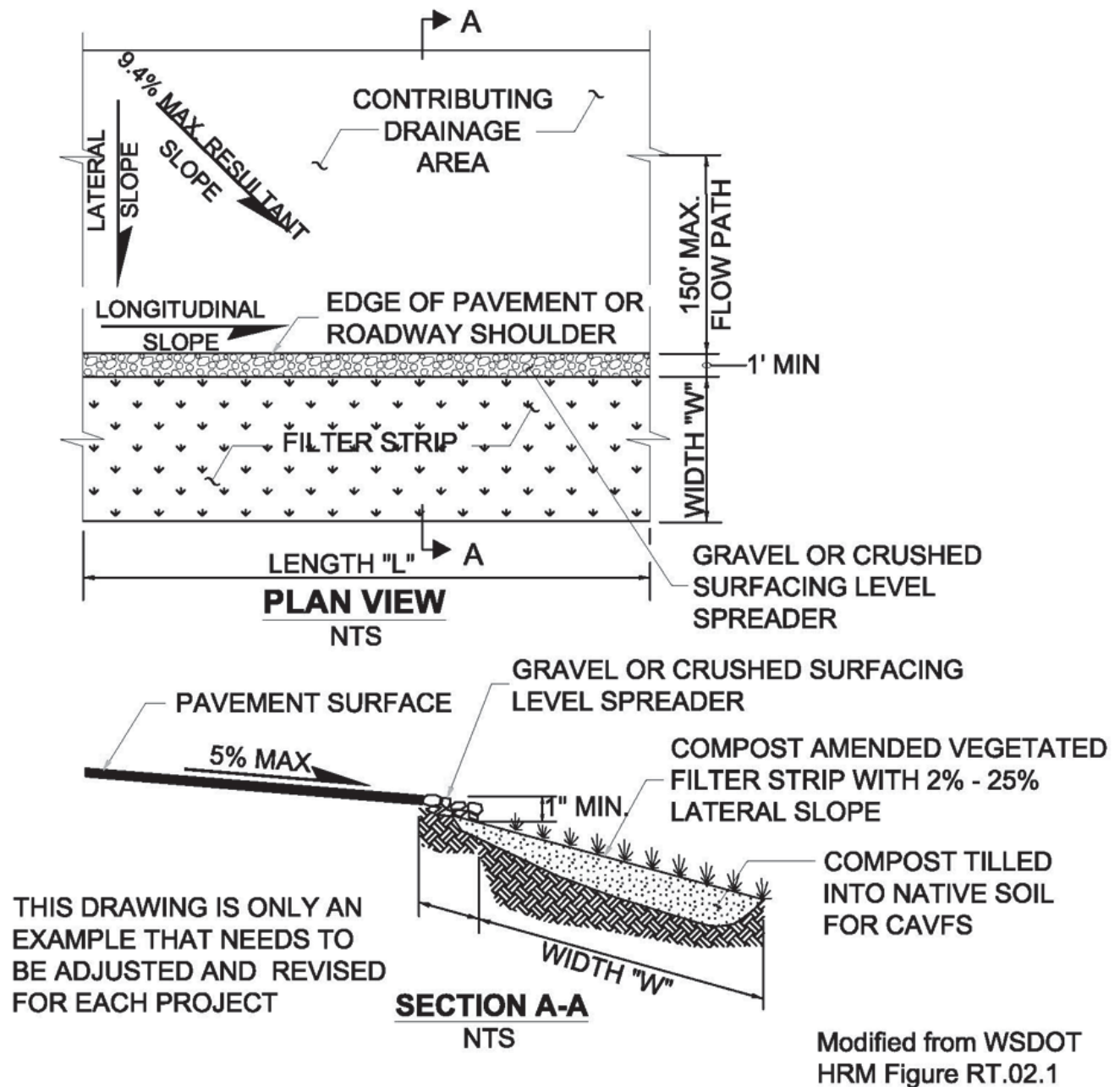


Figure 7.4.3 – Example of a Compost Amended Vegetated Filter Strip (CAVFS)

### Applications

CAVFS can be used to meet basic runoff treatment and enhanced runoff treatment objectives. It has practical application in areas where there is space for roadside embankments that can be built to the CAVFS specifications.

## ***Soil Design Criteria***

The CAVFS design incorporates composted material into the native soils per the criteria in [BMP T5.13](#) for turf areas. However, as noted below, the compost shall not contain biosolids, or manure. The goal is to create a healthy soil environment for a lush growth of turf.

### *Soil/Compost Mix:*

- Presumptive approach: Place and rototill 1.75 inches of composted material into 6.25 inches of soil (a total amended depth of about 9.5 inches), for a settled depth of 8 inches. Water or roll to compact soil to 85% maximum. Plant grass.
- Custom approach: Place and rototill the calculated amount of composted material into a depth of soil needed to achieve 8 inches of settled soil at 5% organic content. Water or roll to compact soil to 85% maximum. Plant grass. The amount of compost or other soil amendments used varies by soil type and organic matter content. If there is a good possibility that site conditions may already contain a relatively high organic content, then it may be possible to modify the pre-approved rate described above and still be able to achieve the 5% organic content target.
- The final soil mix (including compost and soil) should have an initial saturated hydraulic conductivity less than 12 inches per hour, and a minimum long-term hydraulic conductivity of 1.0 inch/hour per ASTM Designation D 2434 (Standard Test Method for Permeability of Granular Soils) at 85% compaction per ASTM Designation D 1557 (Standard Test Method for Laboratory Compaction Characteristics of Soil Using Modified Effort. Infiltration rate and hydraulic conductivity are assumed to be approximately the same in a uniform mix soil. Note: Long term saturated hydraulic conductivity is determined by applying the appropriate infiltration correction factors as explained under “Determining Bioretention soil mix infiltration rate” under [BMP T7.30](#).
- The final soil mixture should have a minimum organic content of 5% by dry weight per ASTM Designation D 2974 (Standard Test Method for Moisture, Ash and Organic Matter of Peat and Other Organic Soils) (Tackett, 2004).
- Achieving the above recommendations will depend on the specific soil and compost characteristics. In general, the recommendation can be achieved with 60% to 65% loamy sand mixed with 25% to 30% compost or 30% sandy loam, 30% coarse sand, and 30% compost.
- The final soil mixture should be tested prior to installation for fertility, micronutrient analysis, and organic material content.
- Clay content for the final soil mix should be less than 5%.
- Compost must not contain biosolids, manure, any street or highway sweepings, or any catch basin solids.

- The pH for the soil mix should be between 5.5 and 7.0 (Stenn, 2003). If the pH falls outside the acceptable range, it may be modified with lime to increase the pH or iron sulfate plus sulfur to lower the pH. The lime or iron sulfate must be mixed uniformly into the soil prior to use in LID areas (Low-Impact Development Center, 2004).
- The soil mix should be uniform and free of stones, stumps, roots, or other similar material larger than 2 inches.
- When placing topsoil, it is important that the first lift of topsoil is mixed into the top of the existing soil. This allows the roots to penetrate the underlying soil easier and helps prevent the formation of a slip plane between the two soil layers.

*Soil Component:*

The texture for the soil component of the LID BMP soil mix should be loamy sand (USDA Soil Textural Classification).

*Compost Component:*

Follow the specifications for compost in [BMP T7.30](#) – Bioretention

***Design Modeling  
Method***

The CAVFS will have an “Element” in the approved continuous runoff models that must be used for determining the amount of water that is treated by the CAVFS. To fully meet treatment requirements, Ninety-one percent of the influent runoff file must pass through the soil profile of the CAVFS. Water that merely flows over the surface is not considered treated. Approved continuous runoff models should be able to report the amount of water that it estimates will pass through the soil profile.

***Maintenance***

Compost, as with sand filters or other filter mediums, can become plugged with fines and sediment, which may require removal and replacement. Including vegetation with compost helps prevent the medium from becoming plugged with sediment by breaking up the sediment and creating root pathways for stormwater to penetrate into the compost. It is expected that soil amendments will have a removal and replacement cycle; however, this time frame has not yet been established.

## No. 20 – COMPOST AMENDED VEGETATED FILTER STRIP (CAVFS)

Maintenance Component	Defect	Conditions When Maintenance is Needed	Results Expected When Maintenance is Performed
General	Sediment accumulation on grass	Sediment depth exceeds 2 inches.	Remove sediment deposits. Relevel so slope is even and flows pass evenly through strip.
	Vegetation	Grass becomes excessively tall (greater than 10 inches); nuisance weeds and other vegetation start to take over.	Mow grass and control nuisance vegetation so that flow is not impeded. Grass should be mowed to a height of 6 inches.
	Trash and debris	Trash and debris have accumulated on the vegetated filter strip.	Remove trash and debris from filter.
	Erosion/scouring	Areas have eroded or scoured due to flow channelization or high flows.	For ruts or bare areas less than 12 inches wide, repair the damaged area by filling with a 50/50 mixture of crushed gravel and compost. The grass will creep in over the rock in time. If bare areas are large, generally greater than 12 inches wide, the vegetated filter strip should be regraded and reseeded. For smaller bare areas, overseed when bare spots are evident.
	Flow spreader	Flow spreader is uneven or clogged so that flows are not uniformly distributed over entire filter width.	Level the spreader and clean so that flows are spread evenly over entire filter width

## **BMP T8.40: Media Filter Drain (previously referred to as the Ecology Embankment)**

### ***General Description***

The media filter drain (MFD), previously referred to as the *ecology embankment*, is a linear flow-through stormwater runoff treatment device that can be sited along highway side slopes (conventional design) and medians (dual media filter drains), borrow ditches, or other linear depressions. Cut-slope applications may also be considered. The media filter drain can be used where available right of way is limited, sheet flow from the highway surface is feasible, and lateral gradients are generally less than 25% (4H:1V). The media filter drain has a General Use Level Designation (GULD) for basic, enhanced, and phosphorus treatment. Updates/changes to the use-level designation and any design changes will be posted in the *Postpublication Updates* section of the [HRM Resource Web Page](#).

Media filter drains (MFDs) have four basic components: a gravel no-vegetation zone, a grass strip, the MFD mix bed, and a conveyance system for flows leaving the MFD mix. This conveyance system usually consists of a gravel-filled underdrain trench or a layer of crushed surfacing base course (CSBC). This layer of CSBC must be porous enough to allow treated flows to freely drain away from the MFD mix.

Typical MFD configurations are shown in Figures [8.5.8](#), [8.5.9](#), and [8.5.10](#).

Figure 8.5.8 – Media filter drain: Cross section

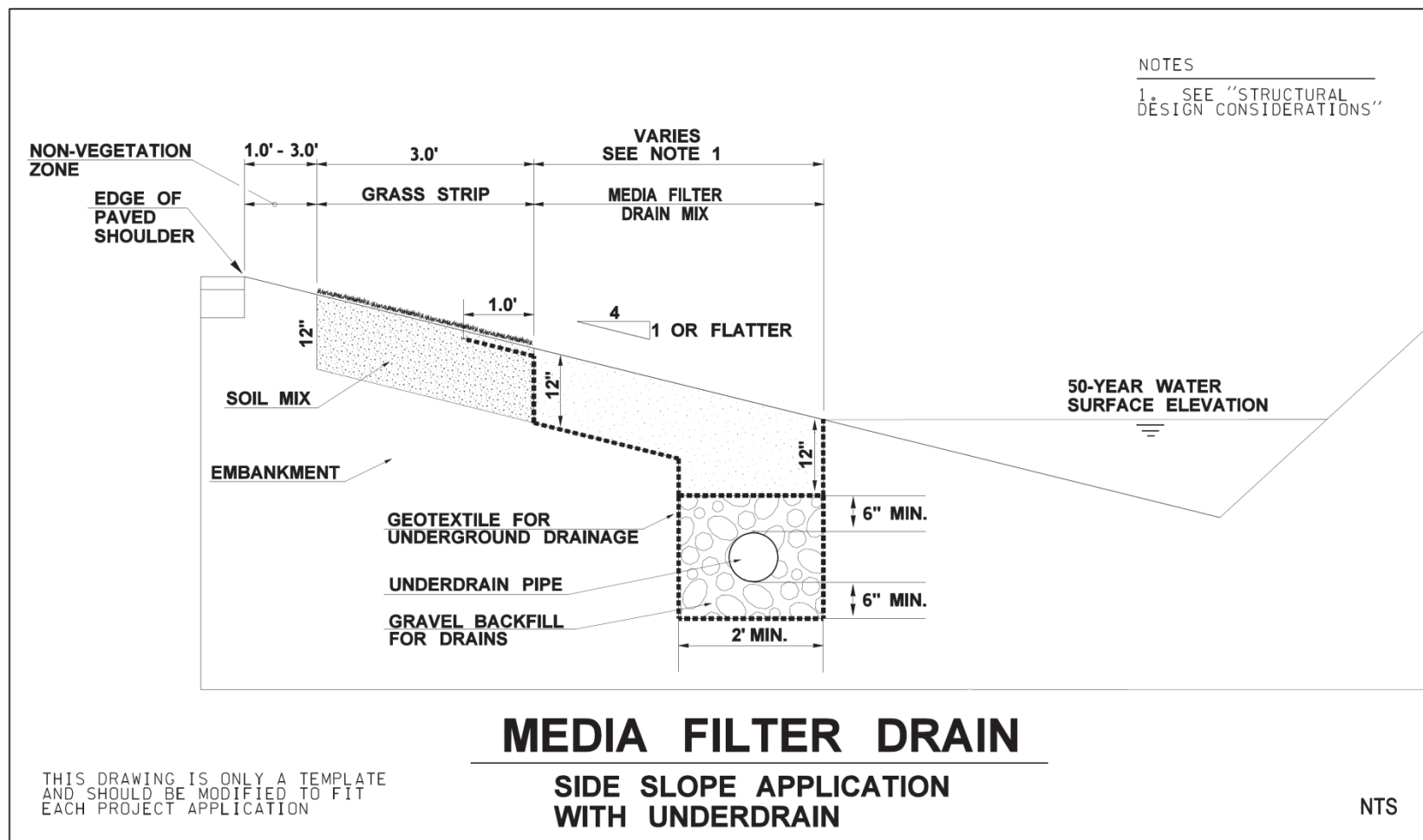




Figure 8.5.9 – Dual media filter drain: Cross section

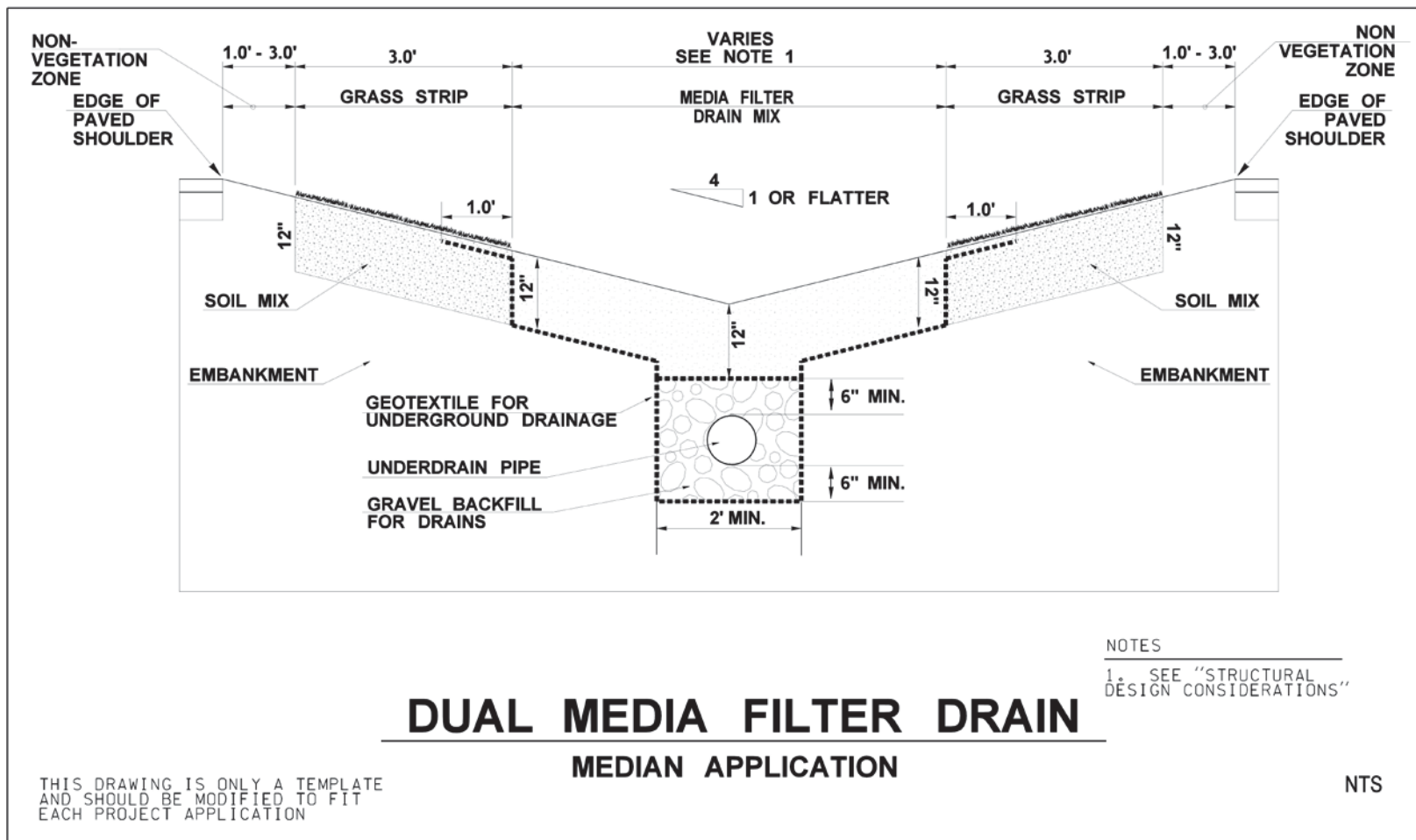
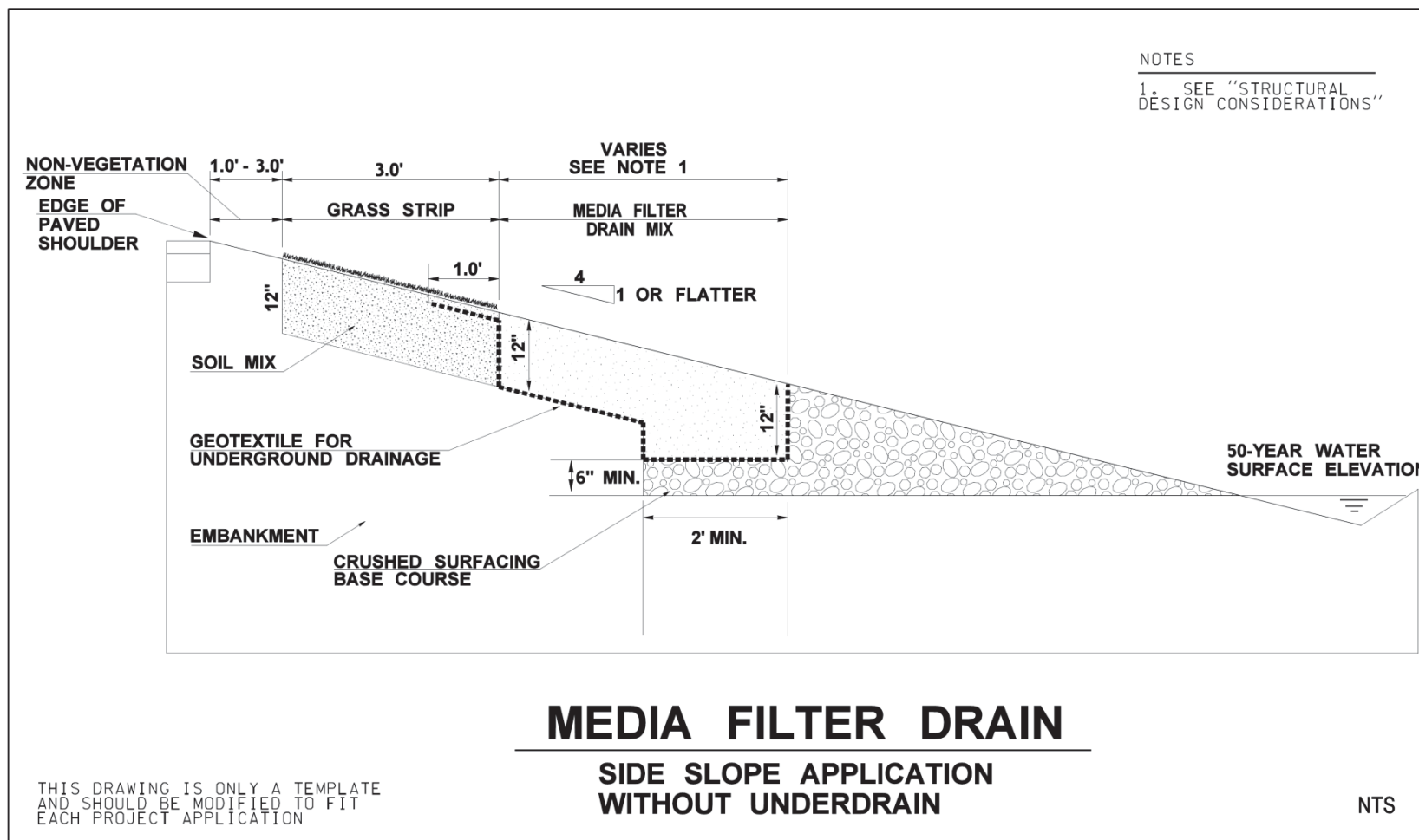


Figure 8.5.10 – Media filter drain without underdrain trench



### ***Functional Description***

The media filter drain removes suspended solids, phosphorus, and metals from highway runoff through physical straining, ion exchange, carbonate precipitation, and biofiltration.

Stormwater runoff is conveyed to the media filter drain via sheet flow over a vegetation-free gravel zone to ensure sheet dispersion and provide some pollutant trapping. Next, a grass strip, which may be amended with composted material, is incorporated into the top of the fill slope to provide pretreatment, further enhancing filtration and extending the life of the system. The runoff is then filtered through a bed of porous, alkalinity-generating granular medium—the media filter drain mix. Media filter drain mix is a fill material composed of crushed rock (sized by screening), dolomite, gypsum, and perlite. The dolomite and gypsum additives serve to buffer acidic pH conditions and exchange light metals for heavy metals. Perlite is incorporated to improve moisture retention, which is critical for the formation of biomass epilithic biofilm to assist in the removal of solids, metals, and nutrients. Treated water drains from the media filter drain mix bed into the conveyance system below the media filter drain mix. Geotextile lines the underside of the media filter drain mix bed and the conveyance system.

The underdrain trench is an option for hydraulic conveyance of treated stormwater to a desired location, such as a downstream flow control facility or stormwater outfall. The trench's perforated underdrain pipe is a protective measure to ensure free flow through the media filter drain mix and to prevent prolonged ponding. It may be possible to omit the underdrain pipe if it can be demonstrated that the pipe is not necessary to maintain free flow through the media filter drain mix and underdrain trench.

It is critical to note that water should sheet flow across the media filter drain. Channelized flows or ditch flows running down the middle of the dual media filter drain (continuous off-site inflow) should be minimized.

### ***Applications and Limitations***

In many instances, conventional runoff treatment is not feasible due to right of way constraints (such as adjoining wetlands and geotechnical considerations). The media filter drain and the dual media filter drain designs are runoff treatment options that can be sited in most right of way confined situations. In many cases, a media filter drain or a dual media filter drain can be sited without the acquisition of additional right of way needed for conventional stormwater facilities or capital-intensive expenditures for underground wet vaults.

#### ***Applications***

##### **Media Filter Drains**

The media filter drain can achieve basic, phosphorus, and enhanced water quality treatment.

Since maintaining sheet flow across the media filter drain is required for its proper function, the ideal locations for media filter drains in highway settings are highway side slopes or other long, linear grades with lateral side slopes less than 4H:1V and longitudinal slopes no steeper than 5%. As side slopes approach 3H:1V, without design modifications, sloughing may become a problem due to friction limitations between the separation geotextile and underlying soils. The longest flow path from the contributing area delivering sheet flow to the media filter drain should not exceed 150 feet.

If there is sufficient roadway embankment width, the designer should consider placing the grass strip and media mix downslope when feasible. The project office should ensure the MFD does not intercept seeps, springs, or ground water.

#### Dual Media Filter Drain for Highway Medians

The dual media filter drain is fundamentally the same as the side-slope version. It differs in siting and is more constrained with regard to drainage options. Prime locations for dual media filter drains in a highway setting are medians, roadside drainage or borrow ditches, or other linear depressions. It is especially critical for water to sheet flow across the dual media filter drain. Channelized flows or ditch flows running down the middle of the dual media filter drain (continuous off-site inflow) should be minimized.

#### *Limitations*

##### Media Filter Drains

- **Steep slopes.** Avoid construction on longitudinal slopes steeper than 5%. Avoid construction on 3H:1V lateral slopes, and preferably use less than 4H:1V slopes. In areas where lateral slopes exceed 4H:1V, it may be possible to construct terraces to create 4H:1V slopes or to otherwise stabilize up to 3H:1V slopes. (For details, see *Geometry, Components and Sizing Criteria, Cross Section* in the Structural Design Considerations section below).
- **Wetlands.** Do not construct in wetlands and wetland buffers. In many cases, a media filter drain (due to its small lateral footprint) can fit within the highway fill slopes adjacent to a wetland buffer. In those situations where the highway fill prism is located adjacent to wetlands, an interception trench/underdrain will need to be incorporated as a design element in the media filter drain.
- **Shallow ground water.** Mean high water table levels at the project site need to be determined to ensure the media filter drain mix bed and the underdrain (if needed) will not become saturated by shallow ground water.
- **Unstable slopes.** In areas where slope stability may be problematic, consult a geotechnical engineer.

- **Areas of seasonal ground water inundations or basement flooding.** Site-specific piezometer data may be needed in areas of suspected seasonal high ground water inundations. The hydraulic and runoff treatment performance of the dual media filter drain may be compromised due to backwater effects and lack of sufficient hydraulic gradient.
- **Narrow roadway shoulders.** In areas where there is a narrow roadway shoulder that does not allow enough room for a vehicle to fully stop or park, consider placing the MFD farther down the embankment slope. This will reduce the amount of rutting in the MFD and decrease overall maintenance repairs.

## **Design Flow Elements**

### ***Flows to Be Treated***

The basic design concept behind the media filter drain and dual media filter drain is to fully filter all runoff through the media filter drain mix. Therefore, the infiltration capacity of the medium and drainage below needs to match or exceed the hydraulic loading rate.

## **Structural Design Considerations**

### ***Geometry***

### ***Components***

#### **No-Vegetation Zone**

The no-vegetation zone (vegetation-free zone) is a shallow gravel zone located directly adjacent to the highway pavement. The no-vegetation zone is a crucial element in a properly functioning media filter drain or other BMPs that use sheet flow to convey runoff from the highway surface to the BMP. The no-vegetation zone functions as a level spreader to promote sheet flow and a deposition area for coarse sediments. The no-vegetation zone should be between 1 foot and 3 feet wide. Depth will be a function of how the roadway section is built from subgrade to finish grade; the resultant cross section will typically be triangular to trapezoidal. Within these bounds, width varies depending on maintenance spraying practices.

#### **Grass Strip**

The width of the grass strip is dependent on the availability of space within the highway side slope. The baseline design criterion for the grass strip within the media filter drain is a 3-foot-minimum-width, but wider grass strips are recommended if the additional space is available. The designer may consider adding aggregate to the soil mix to help minimize rutting problems from errant vehicles. The soil mix should ensure grass growth for the design life of the media filter drain. Composted material used in the grass strip shall meet the specifications for compost used in Bioretention Soil Media (BSM). See BMP T7.30.

## **Media Filter Drain Mix Bed**

The media filter drain mix is a mixture of crushed rock, dolomite, gypsum, and perlite. The crushed rock provides the support matrix of the medium; the dolomite and gypsum add alkalinity and ion exchange capacity to promote the precipitation and exchange of heavy metals; and the perlite improves moisture retention to promote the formation of biomass within the media filter drain mix. The combination of physical filtering, precipitation, ion exchange, and biofiltration enhances the water treatment capacity of the mix. The media filter drain mix has an estimated initial filtration rate of 50 inches per hour and a long-term filtration rate of 28 inches per hour due to siltation. With an additional safety factor, the rate used to size the length of the media filter drain should be 10 inches per hour.

### **Conveyance System Below Media Filter Drain Mix**

The gravel underdrain trench provides hydraulic conveyance when treated runoff needs to be conveyed to a desired location such as a downstream flow control facility or stormwater outfall.

In Group C and D soils, an underdrain pipe would help to ensure free flow of the treated runoff through the media filter drain mix bed. In some Group A and B soils, an underdrain pipe may be unnecessary if most water percolates into subsoil from the underdrain trench. The need for underdrain pipe should be evaluated in all cases. The underdrain trench should be a minimum of 2 feet wide for either the conventional or dual media filter drain.

The gravel underdrain trench may be eliminated if there is evidence to support that flows can be conveyed laterally to an adjacent ditch or onto a fill slope that is properly vegetated to protect against erosion. The media filter drain mix should be kept free draining up to the 50-year storm event water surface elevation represented in the downstream ditch.

### *Sizing Criteria*

#### **Width**

The width of the media filter drain mix bed is determined by the amount of contributing pavement routed to the embankment. The surface area of the media filter drain mix bed needs to be sufficiently large to fully infiltrate the runoff treatment design flow rate using the long-term filtration rate of the media filter drain mix. For design purposes, a 50% safety factor is incorporated into the long-term media filter drain mix filtration rate to accommodate variations in slope, resulting in a design filtration rate of 10 inches per hour. The media filter drain mix bed should have a bottom width of at least 2 feet in contact with the conveyance system below the media filter drain mix.

## Length

In general, the length of a media filter drain or dual media filter drain is the same as the contributing pavement. Any length is acceptable as long as the surface area media filter drain mix bed is sufficient to fully infiltrate the runoff treatment design flow rate.

## Cross Section

In profile, the surface of the media filter drain should preferably have a lateral slope less than 4H:1V (<25%). On steeper terrain, it may be possible to construct terraces to create a 4H:1V slope, or other engineering may be employed if approved by Ecology, to ensure slope stability up to 3H:1V. If sloughing is a concern on steeper slopes, consideration should be given to incorporating permeable soil reinforcements, such as geotextiles, open-graded/ permeable pavements, or commercially available ring and grid reinforcement structures, as top layer components to the media filter drain mix bed. Consultation with a geotechnical engineer is required.

## Inflow

Runoff is conveyed to a media filter drain using sheet flow from the pavement area. The longitudinal pavement slope contributing flow to a media filter drain should be less than 5%.

Although there is no lateral pavement slope restriction for flows going to a media filter drain, the designer should ensure flows remain as sheet flow.

## Media Filter Drain Mix Bed Sizing Procedure

The media filter drain mix should be a minimum of 12 inches deep, including the section on top of the underdrain trench.

For runoff treatment, sizing the media filter drain mix bed is based on the requirement that the runoff treatment flow rate from the pavement area,  $Q_{Highway}$ , cannot exceed the long-term infiltration capacity of the media filter drain,  $Q_{Infiltration}$ :

$$Highway\ Infiltration\ Q \leq Q$$

For western Washington,  $Q_{Highway}$  is the flow rate at or below which 91% of the runoff volume for the developed TDA will be treated, based on a 15-minute time step and can be determined using an approved continuous runoff model.



The long-term infiltration capacity of the media filter drain is based on the following equation:

$$\frac{LTIR * L * W}{C * SF} = Q_{Infiltration}$$

where: *LTIR* = Long-term infiltration rate of the media filter drain mix (use 10 inches per hour for design) (in/hr)

*L* = Length of media filter drain (parallel to roadway) (ft)

*W* = Width of the media filter drain mix bed (ft)

*C* = Conversion factor of 43200 ((in/hr)/(ft/sec))

*SF* = Safety Factor (equal to 1.0, unless unusually heavy sediment loading is expected)

Assuming that the length of the media filter drain is the same as the length of the contributing pavement, solve for the width of the media filter drain:

$$W \geq \frac{Q_{Highway} * C * SF}{LTIR * L}$$

Western Washington project applications of this design procedure have shown that, in almost every case, the calculated width of the media filter drain does not exceed 1.0 foot. Therefore, [Table 8.5.3](#) was developed to simplify the design steps and should be used to establish an appropriate width.

<b>Table 8.5.3</b> <b>Western Washington Design Widths for Media Filter Drains</b>	
<b>Pavement width that contributes runoff to the media filter drain</b>	<b>Minimum media filter drain width*</b>
≤ 20 feet	2 feet
≥ 20 and ≤ 35 feet	3 feet
> 35 feet	4 feet

\* Width does not include the required 1–3 foot gravel vegetation-free zone or the 3-foot filter strip width (see [Figure 8.5.8](#)).

### ***Underdrain Design***

Underdrain pipe can provide a protective measure to ensure free flow through the media filter drain (MFD) mix and is sized similar to storm drains. For MFD underdrain sizing, an additional step is required to determine the flow rate that can reach the underdrain pipe. This is done by



comparing the contributing basin flow rate to the infiltration flow rate through the media filter mix and then using the smaller of the two to size the underdrain. The analysis described below considers the flow rate per foot of MFD, which allows you the flexibility of incrementally increasing the underdrain diameter where long lengths of underdrain are required. When underdrain pipe connects to a storm drain system, place the invert of the underdrain pipe above the 25-year water surface elevation in the storm drain to prevent backflow into the underdrain system.

The following describes the procedure for sizing underdrains installed in combination with media filter drains.

1. Calculate the flow rate per foot from the contributing basin to the media filter drain. The design storm event used to determine the flow rate should be relevant to the purpose of the underdrain. For example, if the MFD installation is in western Washington and the underdrain will be used to convey treated runoff to a detention BMP, size the underdrain for the 50-year storm event. (See the [Hydraulics Manual](#), Figure 2-2.1, for conveyance flow rate determination.)

$$\frac{Q_{highway}}{ft} = \frac{Q_{highway}}{L_{MFD}}$$

where:

$$\frac{Q_{highway}}{ft} = \text{contributing flow rate per foot (cfs/ft)}$$

$$L_{MFD} = \text{length of MFD contributing runoff to the underdrain}$$

(ft)

2. Calculate the MFD flow rate of runoff per foot given an infiltration rate of 10 in/hr through the media filter drain mix.

$$Q_{\frac{MFD}{ft}} = \frac{f \times W \times 1ft}{ft} \times \frac{1ft}{12in} \times \frac{1hr}{3600sec}$$

where:

$$Q_{\frac{MFD}{ft}} = \text{flow rate of runoff through MFD mix layer (cfs/ft)}$$

$$W = \text{width of underdrain trench (ft) – see Standard Plan B-55.20-00; the minimum width is 2 ft}$$

$$f = \text{infiltration rate through the MFD mix (in/hr) = 10 in/hr}$$

3. Size the underdrain pipe to convey the runoff that can reach the underdrain trench. This is taken to be the smaller of the contributing basin flow rate or the flow rate through the MFD mix layer.

$$Q_{\frac{UD}{ft}} = \text{smaller} \left\{ Q_{\frac{highway}{ft}} \text{ or } Q_{\frac{MFD}{ft}} \right\}$$

where:

$Q_{\frac{UD}{ft}}$  = underdrain design flow rate per foot (cfs/ft)

4. Determine the underdrain design flow rate using the length of the MFD and a factor of safety of 1.2.

$$Q_{UD} = 1.2 \times Q_{\frac{UD}{ft}} \times W \times L_{MFD}$$

where:

$Q_{UD}$  = estimated flow rate to the underdrain (cfs)

$W$  = width of the underdrain trench (ft) – see Standard Plan B-55.20-00; the minimum width is 2 ft

$L_{MFD}$  = length of MFD contributing runoff to the underdrain (ft)

5. Given the underdrain design flow rate, determine the underdrain diameter. Round pipe diameters to the nearest standard pipe size and have a minimum diameter of 6 inches. For diameters that exceed 12 inches, contact either the Region or HQ Hydraulics Office.

$$D = 16 \left( \frac{(Q_{UD} \times n)}{s^{0.5}} \right)^{3/8}$$

where:

$D$  = underdrain pipe diameter (inches)

$n$  = Manning's coefficient

$s$  = slope of pipe (ft/ft)

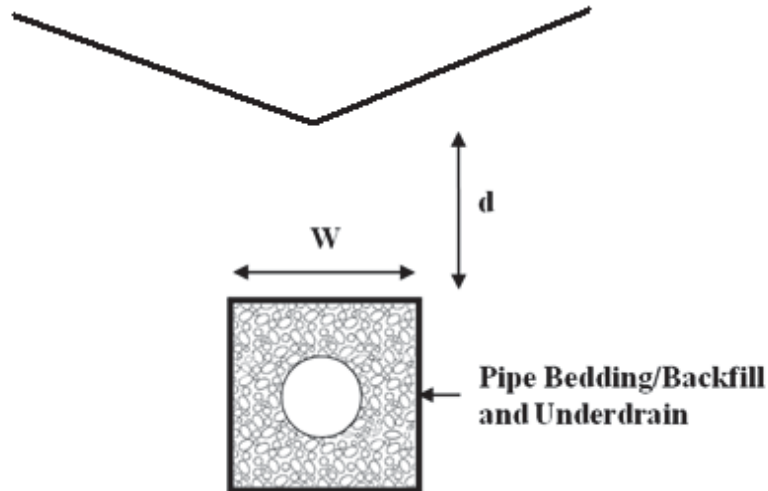
## **Materials**

### **Media Filter Drain Mix**

The media filter drain mix used in the construction of media filter drains consists of the amendments listed in [Table 8.5.4](#). Mixing and transportation must occur in a manner that ensures the materials are thoroughly mixed prior to placement and that separation does not occur during transportation or construction operations.

These materials should be used in accordance with the following *Standard Specifications*:

- Gravel Backfill for Drains, 9-03.12(4)
- Underdrain Pipe, 7-01.3(2)
- Construction Geotextile for Underground Drainage, 9-33.1



**Figure 8.5.4 - Media filter drain underdrain installation**

*Crushed Surfacing Base Course (CSBC)*

If the design is configured to allow the media filter drain to drain laterally into a ditch, the crushed surfacing base course below the media filter drain should conform to Section 9-03.9(3) of the *Standard Specifications*.

***Berms, Baffles, and Slopes***

See *Geometry, Components and Sizing Criteria, Cross Section* under Structural Design Considerations above.

**Table 8.5.4 Media filter drain mix**

Amendment	Quantity												
<p><b>Mineral aggregate: Aggregate for Media Filter Drain Mix</b>  Aggregate for Media filter Drain Mix shall be manufactured from ledge rock, talus, or gravel in accordance with Section 3-01 of the <i>Standard Specifications for Road, Bridge, and Municipal Construction</i> (2002), which meets the following test requirements for quality. The use of recycled material is not permitted.:</p> <p>Los Angeles Wear, 500 Revolutions    35% max.  Degradation Factor                            30 min.</p> <p>Aggregate for the Media Filter Drain Mix shall conform to the following requirements for grading and quality:</p> <table> <tr> <td><b>Sieve Size</b></td><td><b>Percent Passing (by weight)</b></td></tr> <tr> <td>1/2" square</td><td>100</td></tr> <tr> <td>3/8" square</td><td>90-100</td></tr> <tr> <td>U.S. No. 4</td><td>30-56</td></tr> <tr> <td>U.S. No. 10</td><td>0-10</td></tr> <tr> <td>U.S. No. 200</td><td>0-1.5</td></tr> </table> <p>% fracture, by weight, min.            75</p> <p>Static stripping test                        Pass</p> <p>The fracture requirement shall be at least two fractured faces and will apply to material retained on the U.S. No. 10.</p> <p>Aggregate for the Media Filter Drain shall be substantially free from adherent coatings. The presence of a thin, firmly adhering film of weathered rock shall not be considered as coating unless it exists on more than 50% of the surface area of any size between successive laboratory sieves.</p>	<b>Sieve Size</b>	<b>Percent Passing (by weight)</b>	1/2" square	100	3/8" square	90-100	U.S. No. 4	30-56	U.S. No. 10	0-10	U.S. No. 200	0-1.5	3 cubic yards
<b>Sieve Size</b>	<b>Percent Passing (by weight)</b>												
1/2" square	100												
3/8" square	90-100												
U.S. No. 4	30-56												
U.S. No. 10	0-10												
U.S. No. 200	0-1.5												
<p>Perlite:</p> <p><input type="checkbox"/> Horticultural grade, free of any toxic materials)</p> <p><input type="checkbox"/> 0-30% passing US No. 18 Sieve</p> <p><input type="checkbox"/> 0-10% passing US No. 30 Sieve</p>	1 cubic yard per 3 cubic yards of mineral aggregate												
<p>Dolomite: CaMg(CO<sub>3</sub>)<sub>2</sub> (calcium magnesium carbonate)</p> <p><input type="checkbox"/> Agricultural grade, free of any toxic materials)</p> <p><input type="checkbox"/> 100% passing US No. 8 Sieve</p> <p><input type="checkbox"/> 0% passing US No. 16 Sieve</p>	10 pounds per cubic yard of perlite												
<p>Gypsum: Noncalcined, agricultural gypsum CaSO<sub>4</sub>•2H<sub>2</sub>O (hydrated calcium sulfate)</p> <p><input type="checkbox"/> Agricultural grade, free of any toxic materials)</p> <p><input type="checkbox"/> 100% passing US No. 8 Sieve</p> <p><input type="checkbox"/> 0% passing US No. 16 Sieve</p>	<b>1.5 pounds per cubic yard of perlite</b>												

### ***Site Design Elements***

#### ***Landscaping (Planting Considerations)***

Landscaping for the grass strip is the same as for biofiltration swales unless otherwise specified in the special provisions for the project's construction documents.

#### ***Operations and Maintenance***

Maintenance will consist of routine roadside management. While herbicides must not be applied directly over the media filter drain, it may be necessary to periodically control noxious weeds with herbicides in areas around the media filter drain as part of a roadside management program. The use of pesticides may be prohibited if the media filter drain is in a critical aquifer recharge area for drinking water supplies. The designer should check with the local area water purveyor or local health department. Areas of the media filter drain that show signs of physical damage will be replaced by local maintenance staff in consultation with region hydraulics/water quality staff.

#### ***Construction Criteria***

Keep effective erosion and sediment control measures in place until grass strip is established.

Do not allow vehicles or traffic on the MFD to minimize rutting and maintenance repairs

#### ***Signing***

Nonreflective guideposts will delineate the media filter drain. This practice allows personnel to identify where the system is installed and to make appropriate repairs should damage occur to the system. If the media filter drain is in a critical aquifer recharge area for drinking water supplies, signage prohibiting the use of pesticides must be provided.

## No. 19 – MEDIA FILTER DRAIN (MFD)

Maintenance Component	Defect	Conditions When Maintenance is Needed	Results Expected When Maintenance is Performed
General	Sediment accumulation on grass filter strip	Sediment depth exceeds 2 inches or creates uneven grading that interferes with sheet flow.	Remove sediment deposits on grass treatment area of the embankment. When finished, embankment should be level from side to side and drain freely toward the toe of the embankment slope. There should be no areas of standing water once inflow has ceased.
	No-vegetation zone/flow spreader	Flow spreader is uneven or clogged so that flows are not uniformly distributed over entire embankment width.	Level the spreader and clean to spread flows evenly over entire embankment width.
	Poor vegetation coverage	Grass is sparse or bare, or eroded patches are observed in more than 10% of the grass strip surface area.	Determine why grass growth is poor and correct the offending condition. Reseed into loosened, fertile soil or compost; or, replant with plugs of grass from the upper slope.
	Vegetation	Grass becomes excessively tall (greater than 10 inches); nuisance weeds and other vegetation start to take over.	Mow vegetation or remove nuisance vegetation to not impede flow. Mow grass to a height of 6 inches.
	Media filter drain mix replacement	Water is seen on the surface of the media filter drain mix long after the storms have ceased. Typically, the 6-month, 24-hour precipitation event should drain within 48 hours. More common storms should drain within 24 hours. Maintenance also needed on a 10-year cycle and during a preservation project.	Excavate and replace all of the media filter drain mix contained within the media filter drain.
	Excessive shading	Grass growth is poor because sunlight does not reach embankment.	If possible, trim back overhanging limbs and remove brushy vegetation on adjacent slopes.
	Trash and debris	Trash and debris have accumulated on embankment.	Remove trash and debris from embankment.
	Flooding of Media filter drain	When media filter drain is inundated by flood water	Evaluate media filter drain material for acceptable infiltration rate and replace if media filter drain does not meet long-term infiltration rate standards.

### ***Design Criteria for Bioretention***

These design criteria are from the *LID Technical Guidance Manual for Puget Sound* (2012). Refer to that document for additional explanations and background.

Note that the *LID Technical Guidance Manual for Puget Sound* (2012) is for additional information purposes only. You must follow the guidance within this manual if there are any discrepancies between this manual and the *LID Technical Guidance Manual for Puget Sound* (2012).

#### **Flow entrance and presettling**

Flow entrance design will depend on topography, flow velocities and volume entering the pretreatment and bioretention area, adjacent land use and site constraints. Flow velocities entering bioretention should be less than 1.0 ft/second to minimize erosion potential. Five primary types of flow entrances can be used for bioretention:

- *Dispersed, low velocity flow across a landscape area:* Landscape areas and vegetated buffer strips slow incoming flows and provide an initial settling of particulates and are the preferred method of delivering

flows to the bioretention cell., Dispersed flow may not be possible given space limitations or if the facility is controlling roadway or parking lot flows where curbs are mandatory.

- *Dispersed or sheet flow across pavement or gravel and past wheel stops for parking areas.*
  - *Curb cuts for roadside, driveway or parking lot areas:* Curb cuts should include a rock pad, concrete or other erosion protection material in the channel entrance to dissipate energy. Minimum curb cut width should be 12 inches; however, 18 inches is recommended. Avoid the use of angular rock or quarry spalls and instead use round (river) rock if needed. Removing sediment from angular rock is difficult. Flow entrance should drop 2 to 3 inches from curb line and provide an area for settling and periodic removal of sediment and coarse material before flow dissipates to the remainder of the cell.
  - Curb cuts used for bioretention areas in high use parking lots or roadways require increased level of maintenance due to high coarse particulates and trash accumulation in the flow entrance and associated bypass of flows. The following are methods recommended for areas where heavy trash and coarse particulates are anticipated:
    - Curb cut width: 18 inches.
    - At a minimum the flow entrance should drop 2 to 3 inches from gutter line into the bioretention area and provide an area for settling and periodic removal of debris.
    - Anticipate relatively more frequent inspection and maintenance for areas with large impervious areas, high traffic loads and larger debris loads.
    - Catch basins or forebays may be necessary at the flow entrance to adequately capture debris and sediment load from large contributing areas and high use areas. Piped flow entrance in this setting can easily clog and catch basins with regular maintenance are necessary to capture coarse and fine debris and sediment.
- *Pipe flow entrance:* Piped entrances should include rock or other erosion protection material in the channel entrance to dissipate energy and disperse flow.
- *Catch basin:* In some locations where road sanding or higher than usual sediment inputs are anticipated, catch basins can be used to settle sediment and release water to the bioretention area through a grate for filtering coarse material.



- *Trench drains*: can be used to cross sidewalks or driveways where a deeper pipe conveyance creates elevation problems. Trench drains tend to clog and may require additional maintenance.

Woody plants can restrict or concentrate flows and can be damaged by erosion around the root ball and should not be placed directly in the entrance flow path.

### **Bottom area and side slopes**

Bioretention areas are highly adaptable and can fit various settings such as rural and urban roadsides, ultra urban streetscapes and parking lots by adjusting bottom area and side slope configuration. Recommended maximum and minimum dimensions include:

- Maximum planted side slope if total cell depth is greater than 3 feet: 3H:1V. If steeper side slopes are necessary rockeries, concrete walls or soil wraps may be effective design options. Local jurisdictions may require bike and/or pedestrian safety features, such as railings or curbs with curb cuts, when steep side slopes are adjacent to sidewalks, walkways, or bike lanes.
- Minimum bottom width for bioretention swales: 2 feet recommended and 1 foot minimum. Carefully consider flow depths and velocities, flow velocity control (check dams) and appropriate vegetation or rock mulch to prevent erosion and channelization at bottom widths less than 2 feet.

Bioretention areas should have a minimum shoulder of 12 inches (30.5 cm) between the road edge and beginning of the bioretention side slope where flush curbs are used. Compaction effort for the shoulder should 90 percent proctor.

### **Ponding area**

Ponding depth recommendations:

- Maximum ponding depth: 12 inches (30.5 cm).
- Surface pool drawdown time: 24 hours

For design on projects subject to Minimum Requirement #5, and choosing to use List #1 or List #2 of that requirement, a bioretention facility shall have a horizontally projected surface area below the overflow which is at least 5% of the total impervious surface area draining to it. If lawn/landscape area will also be draining to the bioretention facility, Ecology recommends that the bioretention facility's horizontally projected surface area below the overflow be increased by 2% of the lawn/landscape area.

The ponding area provides surface storage for storm flows, particulate settling, and the first stages of pollutant treatment within the cell. Pool

depth and draw-down rate are recommended to provide surface storage, adequate infiltration capability, and soil moisture conditions that allow for a range of appropriate plant species. Soils must be allowed to dry out periodically in order to: restore hydraulic capacity to receive flows from subsequent storms; maintain infiltration rates; maintain adequate soil oxygen levels for healthy soil biota and vegetation; provide proper soil conditions for biodegradation and retention of pollutants. Maximum designed depth of ponding (before surface overflow to a pipe or ditch) must be considered in light of drawdown time.

For bioretention areas with underdrains, elevating the drain to create a temporary saturated zone beneath the drain is advised to promote denitrification (conversion of nitrate to nitrogen gas) and prolong moist soil conditions for plant survival during dry periods (see Underdrain section below for details).

### **Surface overflow**

Surface overflow can be provided by vertical stand pipes that are connected to underdrain systems, by horizontal drainage pipes or armored overflow channels installed at the designed maximum ponding elevations. Overflow can also be provided by a curb cut at the down-gradient end of the bioretention area to direct overflows back to the street. Overflow conveyance structures are necessary for all bioretention facilities to safely convey flows that exceed the capacity of the facility and to protect downstream natural resources and property.

The minimum freeboard from the invert of the overflow stand pipe, horizontal drainage pipe or earthen channel should be 6 inches unless otherwise specified by the local jurisdiction's design standards.

### **Default Bioretention Soil Media (BSM)**

Projects which use the following requirements for the bioretention soil media do not have to test the media for its saturated hydraulic conductivity (aka. Infiltration rate). They may assume the rates specified in the subsection titled "Determining Bioretention Soil Mix Infiltration Rate."

#### *Mineral Aggregate*

Percent Fines: A range of 2 to 4 percent passing the #200 sieve is ideal and fines should not be above 5 percent for a proper functioning specification according to ASTM D422.

#### *Aggregate Gradation*

The aggregate portion of the BSM should be well-graded. According to ASTM D 2487-98 (Classification of Soils for Engineering Purposes (Unified Soil Classification System)), well-graded sand should have the following gradation coefficients:

- Coefficient of Uniformity ( $C_u = D_{60}/D_{10}$ ) equal to or greater than 4, and

- Coefficient of Curve ( $C_c = (D_{30})^2 / D_{60} \times D_{10}$ ) greater than or equal to 1 and less than or equal to 3.

[Table 7.4.1](#) provides a gradation guideline for the aggregate component of a Bioretention Soil Mix specification in western Washington (Hinman, Robertson, 2007). The sand gradation below is often supplied as a well-graded utility or screened. With compost this blend provides enough fines for adequate water retention, hydraulic conductivity within recommended range (see below), pollutant removal capability, and plant growth characteristics for meeting design guidelines and objectives.

<b>Table 7.4.1</b> <b>General Guideline for Mineral Aggregate Gradation</b>	
Sieve Size	Percent Passing
3/8"	100
#4	95-100
#10	75-90
#40	25-40
#100	4-10
#200	2-5

Where existing soils meet the above aggregate gradation, those soils may be amended rather than importing mineral aggregate.

*Compost to Aggregate Ratio, Organic Matter Content, Cation Exchange Capacity*

- Compost to aggregate ratio: 60-65 percent mineral aggregate, 35 – 40 percent compost by volume.
- Organic matter content: 5 – 8 percent by weight.
- Cation Exchange Capacity (CEC) must be  $\geq 5$  milliequivalents/100 g dry soil Note: Soil mixes meeting the above specifications do not have to be tested for CEC. They will readily meet the minimum CEC.

*Compost*

To ensure that the BSM will support healthy plant growth and root development, contribute to biofiltration of pollutants, and not restrict infiltration when used in the proportions cited herein, the following compost standards are required.

- Meets the definition of “composted material” in [WAC 173-350-100](#) and complies with testing parameters and other standards in [WAC 173-350-220](#).
- Produced at a composting facility that is permitted by the jurisdictional health authority. Permitted compost facilities in Washington are included on a list available at <http://www.ecy.wa.gov/programs/swfa/organics/soil.html>

- The compost product must originate a minimum of 65 percent by volume from recycled plant waste comprised of as “yard debris,” “crop residues,” and “bulking agents” as those terms are defined in [WAC 173-350-100](#). A maximum of 35 percent by volume of “post-consumer food waste” as defined in [WAC 173-350-100](#), but not including biosolids, may be substituted for recycled plant waste.
- Stable (low oxygen use and CO<sub>2</sub> generation) and mature (capable of supporting plant growth) by tests shown below. This is critical to plant success in a bioretention soil mixes.
- Moisture content range: no visible free water or dust produced when handling the material.
- Tested in accordance with the U.S. Composting Council “Test Method for the Examination of Compost and Composting” (TMECC), as established in the Composting Council’s “Seal of Testing Assurance” (STA) program. Most Washington compost facilities now use these tests.
- Screened to the following size gradations for Fine Compost when tested in accordance with TMECC test method 02.02-B, Sample Sieving for Aggregate Size Classification.”

Fine Compost shall meet the following gradation by dry weight

Minimum percent passing 2” 100%

Minimum percent passing 1” 99%

Minimum percent passing 5/8” 90%

Minimum percent passing 1/4” 75%

- pH between 6.0 and 8.5 (TMECC 04.11-A). “Physical contaminants” (as defined in WAC 173-350-100) content less than 1% by weight (TMECC 03.08-A) total, not to exceed 0.25 percent film plastic by dry weight.
- Minimum organic matter content of 40% (TMECC 05.07-A “Loss on Ignition)
- Soluble salt content less than 4.0 dS/m (mmhos/cm) (TMECC 04.10-A “Electrical Conductivity, 1:5 Slurry Method, Mass Basis”)
- Maturity indicators from a cucumber bioassay (TMECC 05.05-A “Seedling Emergence and Relative Growth ) must be greater than 80% for both emergence and vigor”)
- Stability of 7 mg CO<sub>2</sub>-C/g OM/day or below (TMECC 05.08-B “Carbon Dioxide Evolution Rate”)
- Carbon to nitrogen ratio (TMECC 05.02A “ Carbon to Nitrogen Ratio” which uses 04.01 “Organic Carbon” and 04.02D “Total Nitrogen by Oxidation”) of less than 25:1. The C:N ratio may be up to

35:1 for plantings composed entirely of Puget Sound Lowland native species and up to 40:1 for coarse compost to be used as a surface mulch (not in a soil mix).

### **Design Criteria for Custom Bioretention Soil Mixes**

Projects which prefer to create a custom Bioretention Soil Mix rather than using the default requirements above must demonstrate compliance with the following criteria using the specified test method:

- $CEC \geq 5$  meq/100 grams of dry soil; USEPA 9081
- pH between 5.5 and 7.0
- 5 - 8 percent organic matter content before and after the saturated hydraulic conductivity test; ASTM D2974(Standard Test Method for Moisture, Ash, and Organic Matter of Peat and Other Organic Soils)
- 2-5 percent fines passing the 200 sieve; TMECC 04.11-A
- Measured (Initial) saturated hydraulic conductivity of less than 12 inches per hour; ASTM D 2434 (Standard Test Method for Permeability of Granular Soils (Constant Head)) at 85% compaction per ASTM D 1557 (Standard Test Method s for Laboratory Compaction Characteristics of Soil Using Modified Effort). Also, use [Appendix V-B](#), Recommended Procedures for ASTM D 2434 When Measuring Hydraulic Conductivity for Bioretention Soil Mixes.
- Design (long-term) saturated hydraulic conductivity of more than 1 inch per hour. Note: Design saturated hydraulic conductivity is determined by applying the appropriate infiltration correction factors as explained above under “Determining Bioretention soil mix infiltration rate.”
- If compost is used in creating the custom mix, it must meet all of the specifications listed above for compost except for the gradation specification. An alternative gradation specification must indicate the minimum percent passing for a range of similar particle sizes.

### **Soil Depth:**

Soil depth must be a minimum of 18 inches to provide water quality treatment and good growing conditions for selected plants

### **Filter Fabrics:**

Do not use filter fabrics between the subgrade and the Bioretention Soil Mix. The gradation between existing soils and Bioretention Soil Mix is not great enough to allow significant migration of fines into the Bioretention Soil Mix. Additionally, filter fabrics may clog with downward migration of fines from the Bioretention Soil Mix.

**Hydraulic restriction layers:**

Adjacent roads, foundations or other infrastructure may require that infiltration pathways are restricted to prevent excessive hydrologic loading. Two types of restricting layers can be incorporated into bioretention designs:

- Clay (bentonite) liners are low permeability liners. Where clay liners are used underdrain systems are necessary. See Volume V [section 4.4.3](#) for guidelines.
- Geomembrane liners completely block infiltration to subgrade soils and are used for ground water protection when bioretention facilities are installed to filter storm flows from pollutant hotspots or on sidewalls of bioretention areas to restrict lateral flows to roadbeds or other sensitive infrastructure. Where geomembrane liners are used to line the entire facility underdrain systems are necessary. The liner should have a minimum thickness of 30 mils and be ultraviolet (UV) resistant.

## **Plant materials**

In general, the predominant plant material utilized in bioretention areas are facultative species adapted to stresses associated with wet and dry conditions. Soil moisture conditions will vary within the facility from saturated (bottom of cell) to relatively dry (rim of cell). Accordingly, wetland plants may be used in the lower areas, if saturated soil conditions exist for appropriate periods, and drought-tolerant species planted on the perimeter of the facility or on mounded areas. See the *LID Technical Guidance Manual for Puget Sound* (2012) for additional guidance and recommended plant species.

Note that the *LID Technical Guidance Manual for Puget Sound* (2012) is for additional informational purposes only. You must follow the guidance within this manual if there are any discrepancies between this manual and the *LID Technical Guidance Manual for Puget Sound* (2012).

## **Mulch layer**

You can design Bioretention areas with or without a mulch layer. When used, mulch shall be:

- Coarse compost in the bottom of the facilities (compost is less likely to float during cell inundation). Compost shall not include biosolids or manures.
- Shredded or chipped hardwood or softwood on side slopes above ponding elevation and rim area. Arborist mulch is mostly woody trimmings from trees and shrubs and is a good source of mulch material. Wood chip operations are a good source for mulch material that has more control of size distribution and consistency. Do not use shredded construction wood debris or any shredded wood to which preservatives have been added.
- Free of weed seeds, soil, roots and other material that is not **bole** or branch wood and bark.
- A maximum of 2 to 3 inches thick.

Mulch shall **not** be:

- Grass clippings (decomposing grass clippings are a source of nitrogen and are not recommended for mulch in bioretention areas).
- Pure bark (bark is essentially sterile and inhibits plant establishment).

In bioretention areas where higher flow velocities are anticipated an aggregate mulch may be used to dissipate flow energy and protect underlying Bioretention Soil Mix. Aggregate mulch varies in size and type, but 1 to 1 1/2 inch gravel (rounded) decorative rock is typical.

## **Installation**



## **Excavation**

Soil compaction can lead to facility failure; accordingly, minimizing compaction of the base and sidewalls of the bioretention area is critical. Excavation should never be allowed during wet or saturated conditions (compaction can reach depths of 2-3 feet during wet conditions and mitigation is likely not be possible). Excavation should be performed by machinery operating adjacent to the bioretention facility and no heavy equipment with narrow tracks, narrow tires, or large lugged, high pressure tires should be allowed on the bottom of the bioretention facility. If machinery must operate in the bioretention cell for excavation, use light weight, low ground-contact pressure equipment and rip the base at completion to refracture soil to a minimum of 12 inches. If machinery operates in the facility, subgrade infiltration rates must be field tested and compared to design rates. Failure to meet or exceed the design infiltration rate will require revised engineering designs to verify achievement of treatment and flow control benefits that were estimated in the Stormwater Site Plan.

Prior to placement of the BSM, the finished subgrade shall:

- Be scarified to a minimum depth of 3 inches.
- Have any sediment deposited from construction runoff removed. To remove all introduced sediment, subgrade soil should be removed to a depth of 3-6 inches and replaced with BSM.
- Be inspected by the responsible engineer to verify required subgrade condition.

Sidewalls of the facility, beneath the surface of the BSM, can be vertical if soil stability is adequate. Exposed sidewalls of the completed bioretention area with BSM in place should be no steeper than 3H:1V. The bottom of the facility should be flat.

## **Soil Placement**

On-site soil mixing or placement shall not be performed if Bioretention Soil Mix or subgrade soil is saturated. The bioretention soil mixture should be placed and graded by machinery operating adjacent to the bioretention facility. If machinery must operate in the bioretention cell for soil placement, use light weight equipment with low ground-contact pressure. If machinery operates in the facility, subgrade infiltration rates must be field tested and compared to design rates. Failure to meet or exceed the design infiltration rate will require revised engineering designs to verify achievement of treatment and flow control benefits that were estimated in the Stormwater Site Plan.

The soil mixture shall be placed in horizontal layers not to exceed 6 inches per lift for the entire area of the bioretention facility.



Compact the Bioretention Soil Mix to a relative compaction of 85 percent of modified maximum dry density (ASTM D 1557). Compaction can be achieved by boot packing (simply walking over all areas of each lift), and then apply 0.2 inches (0.5 cm) of water per 1 inch (2.5 cm) of Bioretention Soil Mix depth. Water for settling should be applied by spraying or sprinkling.

## Temporary Erosion and Sediment Control (TESC)

Controlling erosion and sediment are most difficult during clearing, grading, and construction; accordingly, minimizing site disturbance to the greatest extent practicable is the most effective sediment management.

During construction:

- Bioretention facilities should not be used as sediment control facilities and all drainage should be directed away from bioretention facilities after initial rough grading. Flow can be directed away from the facility with temporary diversion swales or other approved protection. If introduction of construction runoff cannot be avoided see below for guidelines.
- Construction on Bioretention facilities should not begin until all contributing drainage areas are stabilized according to erosion and sediment control BMPs and to the satisfaction of the engineer.
- If the design includes curb and gutter, the curb cuts and inlets should be blocked until Bioretention Soil Mix and mulch have been placed and planting completed (when possible), and dispersion pads are in place.

Every effort during design, construction sequencing and construction should be made to prevent sediment from entering bioretention facilities. However, bioretention areas are often distributed throughout the project area and can present unique challenges during construction. See the *LID Technical Guidance Manual for Puget Sound* (2012) for guidelines if no other options exist and runoff during construction must be directed through the bioretention facilities.

Note that the *LID Technical Guidance Manual for Puget Sound* (2012) is for additional informational purposes only. You must follow the guidance within this manual if there are any discrepancies between this manual and the *LID Technical Guidance Manual for Puget Sound* (2012).

Erosion and sediment control practices must be inspected and maintained on a regular basis.

### **Verification**

If using the default bioretention soil media, pre-placement laboratory analysis for saturated hydraulic conductivity of the bioretention soil media is not required. Verification of the mineral aggregate gradation, compliance with the compost specifications, and the mix ratio must be provided.

If using a custom bioretention soil media, verification of compliance with the minimum design criteria cited above for such custom mixes must be provided. This will require laboratory testing of the material that will be used in the installation. Testing shall be performed by a Seal of Testing Assurance, AASHTO, ASTM or other standards organization accredited laboratory with current and maintained certification. Samples for testing

must be supplied from the BSM that will be placed in the bioretention areas.

If testing infiltration rates is necessary for post-construction verification use the Pilot Infiltration Test (PIT) method or a double ring infiltrometer test (or other small-scale testing allowed by the local government with jurisdiction). If using the PIT method, do not excavate Bioretention Soil Mix (conduct test at level of finished Bioretention Soil Mix elevation), use a maximum of 6 inch ponding depth and conduct test before plants are installed.

### ***Maintenance***

Bioretention areas require annual plant, soil, and mulch layer maintenance to ensure optimum infiltration, storage, and pollutant removal capabilities. In general, bioretention maintenance requirements are typical landscape care procedures and include:

- **Watering:** Plants should be selected to be drought tolerant and not require watering after establishment (2 to 3 years). Watering may be required during prolonged dry periods after plants are established.
- **Erosion control:** Inspect flow entrances, ponding area, and surface overflow areas periodically, and replace soil, plant material, and/or mulch layer in areas if erosion has occurred. Properly designed facilities with appropriate flow velocities should not have erosion problems except perhaps in extreme events. If erosion problems occur the following should be reassessed: (1) flow volumes from contributing areas and bioretention cell sizing; (2) flow velocities and gradients within the cell; and (3) flow dissipation and erosion protection strategies in the pretreatment area and flow entrance. If sediment is deposited in the bioretention area, immediately determine the source within the contributing area, stabilize, and remove excess surface deposits.
- **Sediment removal:** Follow the maintenance plan schedule for visual inspection and remove sediment if the volume of the ponding area has been compromised.
- **Plant material:** Depending on aesthetic requirements, occasional pruning and removing dead plant material may be necessary. Replace all dead plants and if specific plants have a high mortality rate, assess the cause and replace with appropriate species. Periodic weeding is necessary until plants are established.
- **Weeding:** Invasive or nuisance plants should be removed regularly and not allowed to accumulate and exclude planted species. At a minimum, schedule weeding with inspections to coincide with important horticultural cycles (e.g., prior to major weed varieties dispersing seeds). Weeding should be done manually and without herbicide applications. The weeding schedule should become less frequent if the appropriate plant species and planting density are used and the selected plants grow to capture the site and exclude undesirable weeds.

- **Nutrient and pesticides:** The soil mix and plants are selected for optimum fertility, plant establishment, and growth. Nutrient and pesticide inputs should not be required and may degrade the pollutant processing capability of the bioretention area, as well as contribute pollutant loads to receiving waters. By design, bioretention facilities are located in areas where phosphorous and nitrogen levels may be elevated and these should not be limiting nutrients. If in question, have soil analyzed for fertility.
- **Mulch:** Replace mulch annually in bioretention facilities where heavy metal deposition is high (e.g., contributing areas that include gas stations, ports and roads with high traffic loads). In residential settings or other areas where metals or other pollutant loads are not anticipated to be high, replace or add mulch as needed (likely 3 to 5 years) to maintain a 2 to 3 inch depth.

**Soil:** Soil mixes for bioretention facilities are designed to maintain long-term fertility and pollutant processing capability. Estimates from metal attenuation research suggest that metal accumulation should not present an environmental concern for at least 20 years in bioretention systems, but this will vary according to pollutant load. Replacing mulch media in bioretention facilities where heavy metal deposition is likely provides an additional level of protection for prolonged performance. If in question, have soil analyzed for fertility and pollutant levels.

## **Appendix D – Flow Control and Water Quality Applications Maps**

### **Mapping**

~~City of SeaTac equivalents to the Flow Control Applications Map and the Water Quality Applications Map are attached. In lieu of a SeaTac equivalent to the County Landslide Hazard Drainage Areas Map, the City will rely on King County's map.~~



# Flow Control Applications Map

**CITY OF SEATAC**

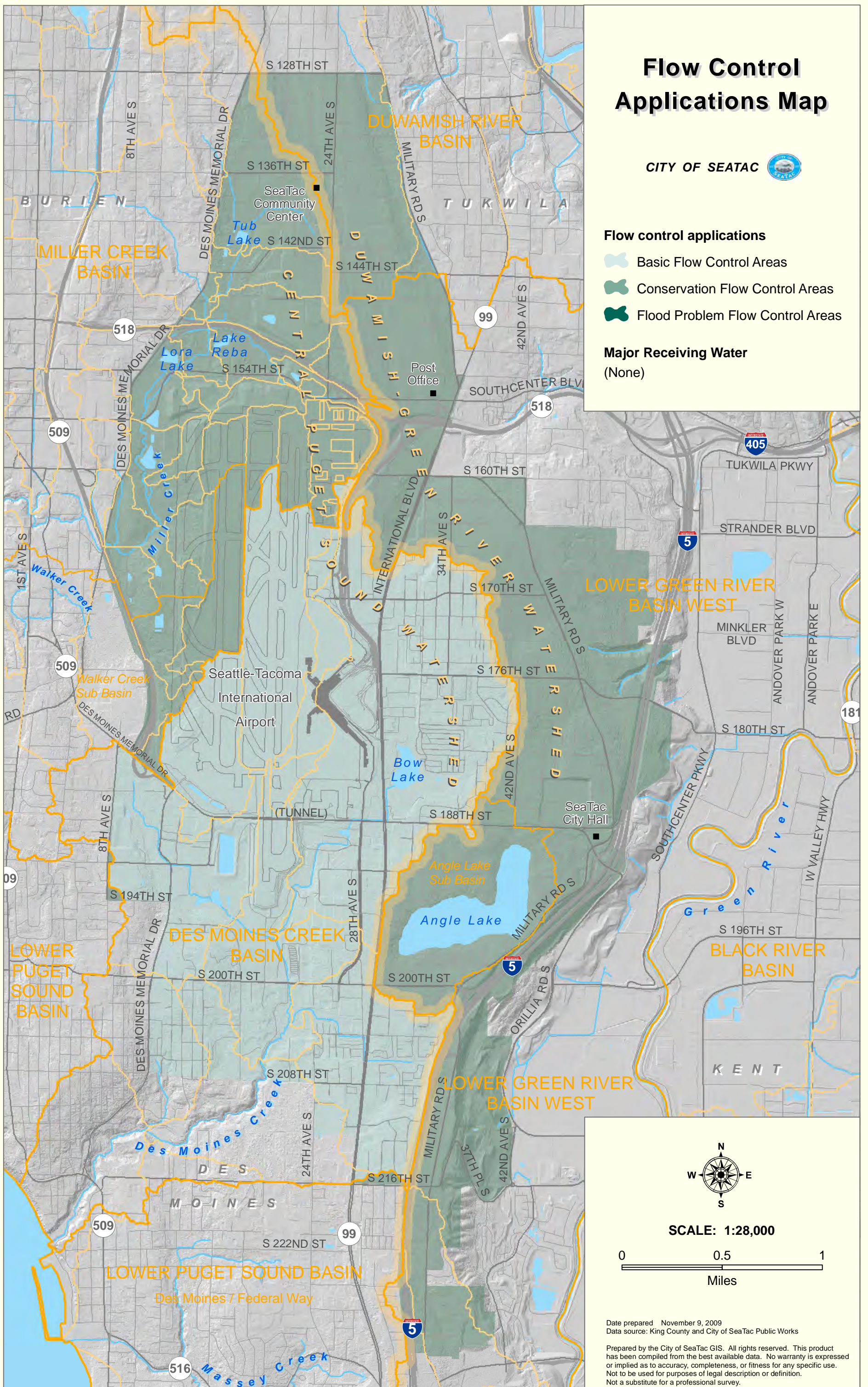


## Flow control applications

- Basic Flow Control Areas
- Conservation Flow Control Areas
- Flood Problem Flow Control Areas

### Major Receiving Water

(None)







# Water Quality Applications Map


CITY OF SEATAC 

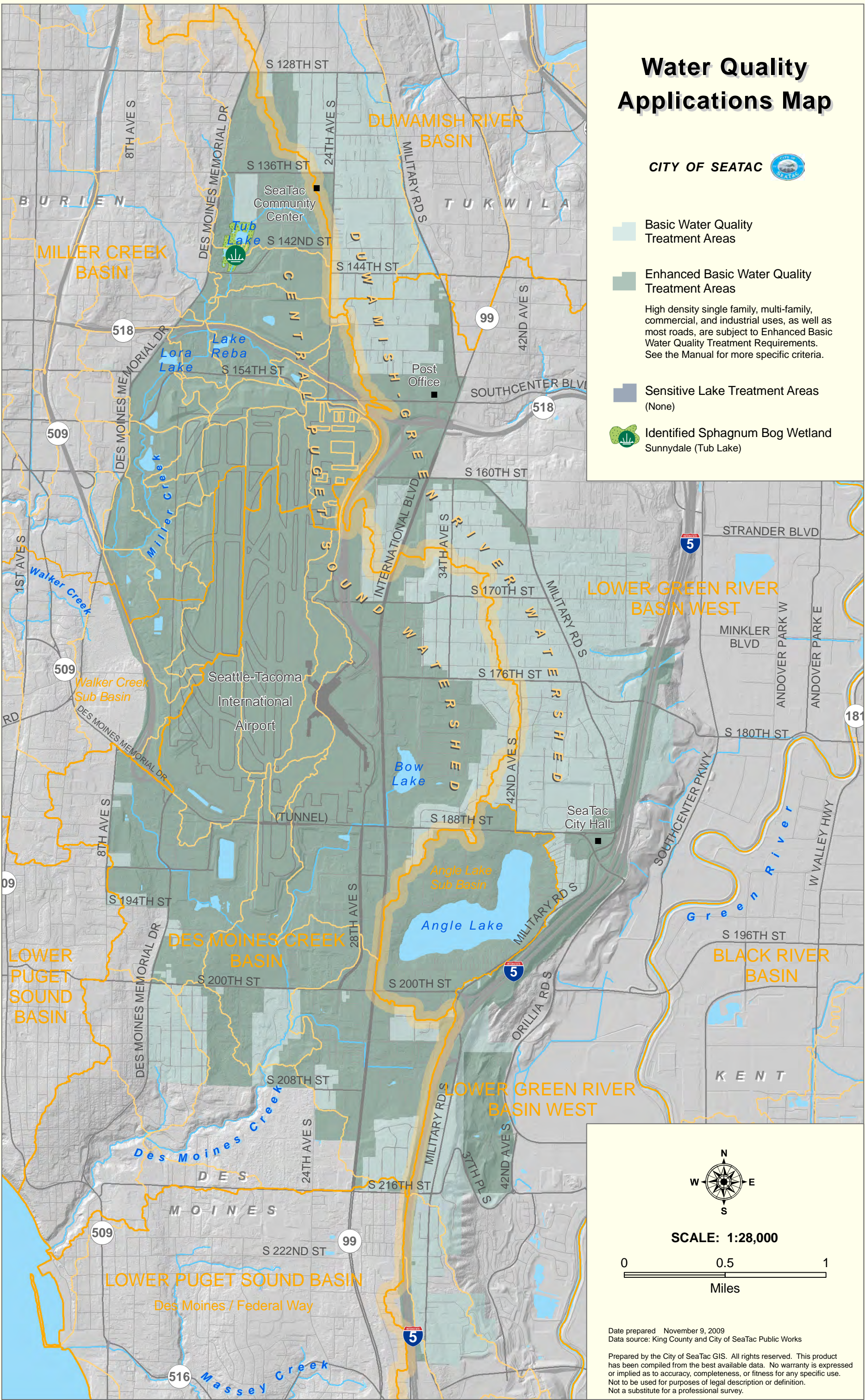
 Basic Water Quality Treatment Areas

 Enhanced Basic Water Quality Treatment Areas

High density single family, multi-family, commercial, and industrial uses, as well as most roads, are subject to Enhanced Basic Water Quality Treatment Requirements. See the Manual for more specific criteria.

 Sensitive Lake Treatment Areas (None)

 Identified Sphagnum Bog Wetland Sunnydale (Tub Lake)







**NEW DOCUMENT**  
**City of SeaTac**  
**Addendum to Road Standards**

**Effective date**  
**January 1, 2017**



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# Introduction

This document is organized into two sections:

- **Section 1:** Addendum to the 2007 King County Road Standards (KCRS)
- **Section 2:** Addendum to the 2016 Washington Department of Transportation (WSDOT) Standard Specifications for Road, Bridge, and Municipal Construction

This document applies to development and redevelopment proposals within the City of SeaTac (City). This addendum includes revisions to the KCRS and WSDOT Standard Specifications for Road, Bridge, and Municipal Construction to address differences in the City's organization and processes. No major substantive changes have been made to the KCRS or the WSDOT Standard Specifications for Road, Bridge, and Municipal Construction.

[**Note:** Clarifications and interpretations will be documented and made available through policy statements within the City's Development Standards.]

The information presented in each section is organized as follows:

- **Terminology:** At times King County, WSDOT, and the City use different terminology to describe or refer to equivalent subject matter. This subsection identifies these terms and the City's equivalent terminology.
- **Key Revisions:** This subsection specifically identifies revisions the City has made to the KCRS and the WSDOT Standard Specifications for Road, Bridge, and Municipal Construction. These revisions are necessary to meet the intent of the low impact development (LID) code and enforceable document review and revision requirement in the National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Phase II Permit and to address differences between King County, WSDOT, and City procedures.
- **Supplemental Documents (Section 1 only):** This section identifies technical guidance manuals and documents which shall be used to supplement the KCRS.
- **Code Reference Table (Section 1 only):** The King County Code (KCC) is referenced in several places in the KCRS. This subsection identifies these code references and equivalent city code where applicable.

Supplemental information in the appendices includes the following:

- **Appendix A:** City Road and Stormwater Design Details
- **Appendix B:** WSDOT General Special Provisions (GSPs) for Permeable Pavement
- **Appendix C:** Reference Materials

# Section 1. Addendum to the 2007 King County Road Standards

## 1.1 Terminology

At times King County and the City use different terminology to describe or to refer to equivalent subject matter. This subsection identifies these terms and the City's equivalent terminology.

**County Road Engineer** = Public Works City Engineer or designee.

**Department of Development and Environmental Services (DDES)** = City of SeaTac Public Works and Community and Economic Development Departments.

**Department of Natural Resources and Parks (DNRP)** = City of SeaTac Department of Parks & Recreation.

**Department of Transportation** = City of SeaTac Public Works Department.

**King County** = City of SeaTac.

**King County Adopted Basin Plans** = City of SeaTac Adopted Basin Plans.

**King County Capital Improvement Program** = City of SeaTac Capital Improvement Program.

**King County Code (KCC)** = SeaTac Municipal Code (SMC). Check code reference table for equivalent code sections.

**King County Comprehensive Plan** = City of SeaTac Comprehensive Plan.

**King County Flood Hazard Plan** = City of SeaTac requirements in Chapter 15.700 SMC Environmentally Sensitive Areas.

**King County Historic Preservation Program** = No equivalent.

**King County Landmarks Register** = No equivalent.

**King County Parks and Open Space Plan** = City of SeaTac Parks, Recreation, and Open Space Element of the Comprehensive Plan.

**King County Regional Trails Plan** = City of SeaTac Trails Plan.

**King County Road Standards** = King County Road Standards as amended by this document.

**King County Non-Motorized Transportation Plan** = City of SeaTac Transportation Master Plan.

**Reviewing Agency** = City of SeaTac Community and Economic Development Department.

**Surface Water Design Manual** = King County Surface Water Design Manual (KCSWDM) as amended by the City Addendum to the KCSWDM.

**Water and Land Resources (WLR) Division** = City of SeaTac Public Works Department.

**Zoning Classifications: Where the KCRS references Agricultural (A) Zoning, Forest (F) Zoning, or Rural (R) Zoning** = These zoning classifications are intended for areas outside of the Urban Growth Boundary, therefore the City of SeaTac contains no equivalent zoning. Refer to City zoning maps to determine which zoning classifications apply to your project.

## 1.2 Key Revisions

This subsection identifies revisions the City has made to the KCRS. These revisions are necessary to meet the intent of the low impact development (LID) code and enforceable document review and revision requirement in the National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Phase II Permit and to address differences between King County and City procedures.

### 1.2.1 General Revisions

**Cul-de-sac Islands** – The City allows vegetated or bioretention islands as an optional feature for any cul-de-sac when bulb paved diameter is 80 feet or less and mandatory when bulb paved diameter exceeds 80 feet. Vegetated islands shall have full depth vertical curb with a minimum diameter of 20 feet. Bioretention islands shall have extruded curb with curb cuts to allow stormwater to enter the facility and a minimum diameter of 15 feet. The paved travel way around the circumference shall be a minimum of 20 feet. Vegetated and bioretention islands shall be landscaped with native and drought tolerant vegetation and maintained by the adjoining landowners or the homeowners' association.

**Curb and Gutter Exemptions** – Curb cuts and grates can be incorporated to allow water to enter stormwater facilities and LID BMPs.

**Compaction Requirements for Permeable Pavement Base Course** – The City allows 90-92 percent compaction and deviations in base course requirements for permeable pavement as documented in WSDOT's GSPs (see Permeable Pavement Guidance below).

**Compaction Requirements for Bioretention** – The City allows 85 compaction for bioretention facilities.

**Separation Requirements** – Stormwater BMPs shall not have utilities located within them unless approved by the City. Adequate separation (as determined by the City) between stormwater facilities and other utilities will also be required. Perpendicular utility crossings within stormwater BMPs are allowed with the following conditions:

- Water service lines/piping may be located within the bioretention facility footprint when necessary. City approval is required.
- Water meters shall be located outside of bioretention facility footprint.
- Fire hydrants shall be located at least 5 feet outside of bioretention facility footprint.
- No plantings except groundcover and sods within 5 feet of hydrant.

- New side sewers and service drains may be located within bioretention facility footprint with approved pipe sleeves and/or liners.
- New infiltration facilities are allowed over existing PVC or ductile iron side sewer crossings with approved pipe sleeves and/or liners.
- Franchise utilities (power, gas, communication) are allowed with approval from the Public Works Director or designee and the franchisee.

**Soil Amendments** – The City requires soil amendments for disturbed areas in accordance with the KCSWDM as amended by the City Addendum to the KCSWDM.

**Street Trees and Landscaping** – City-specific requirements for street trees and landscaping are included in the following SMC sections:

- Planting strip landscaping shall be designed in accordance with SMC 15.445.120
- Street tree diameters and heights shall be designed in accordance with SMC 15.445.120
- Requirements for on-site street frontage landscaping are described in SMC 15.445.200.
- Requirements for retaining significant trees are described in SMC 15.445.400 through 15.445.450
- Irrigation requirements are described in SMC 15.445.140

**Shared Utility Trenches** – The City promotes the use of joint or common trenches by all utilities and rights-of-way franchise holders where feasible as described in SMC 11.20.070.

**Permeable Pavement Guidance** – The City allows the use of WSDOT’s General Special Provisions (GSPs) for Porous Hot Mix Asphalt (PHMA), Porous Warm Mix Asphalt (PWMA), and Pervious Concrete (PConcrete) developed by the Construction Materials Committee of the American Public Works Association (APWA) Washington dated March 9, 2016. These GSPs are included in Appendix B of this document.

## 1.2.2 Specific Revisions

City Revisions to the King County Road Standards		
KCRS Reference	KCRS Existing Requirement	City Specific Revision
1.02	These Standards shall apply prospectively to all newly constructed road and right-of-way facilities, both public and private, within King County. In the event of conflict with the Surface Water Design Manual, improvements within the roadway right-of-way shall meet the requirements of these Standards.	The City requires that the KCSWDM as amended by the Addendum to the KCSWDM govern in the case of conflict with the KCRS.
1.11.A.	Required elements on Engineering Plans, Final Corrected Plans, and Final Plat Plans.	The City requires all plan submittals to meet the minimum requirements in the KCSWDM as amended by the Addendum to the KCSWDM.
1.11.B	Waiver of Plan Requirements	The City requires all projects to meet the minimum requirements in the KCSWDM as amended by the Addendum to the KCSWDM.  The City does not allow waiver 1.11.B.4.
1.12	Variances	The City requires that the KCSWDM as amended by the Addendum to the KCSWDM govern in the case of conflict with the KCRS.
1.14.A.	Performance/ Restoration Financial Guarantees	The City's performance requirements are provided in SMC 11.05.120.
1.14.B.	Maintenance/Defect Guarantees	The City's maintenance/defect guarantees are provided in SMC 11.05.120.
2.06.C.	King County will not accept private streets for maintenance as public streets until such streets are brought into conformance with current King County Code and these Standards.	The City does not accept maintenance responsibilities for private roads.
2.06.E.	King County will not accept private streets within short plats when the roads providing access to the plat are private and already have the potential to serve more than the number of lots specified in Section 2.06(B.7). If a short plat has been proposed on a property to which the only access is over private streets that fail to meet the standards specified in this section, the proposal shall be denied.	The City does not accept maintenance responsibilities for private roads.
Chapter 3 Figures	2 percent sidewalk slope towards curb inlet	The City allows sidewalks adjacent to bioretention facilities to drain towards the facility.

City Revisions to the King County Road Standards		
KCRS Reference	KCRS Existing Requirement	City Specific Revision
3.01.E-F. 4.02 Figures 3-003, through 3-009, Figures 3-012 through 3-014	Driveways	The City allows permeable pavement (porous concrete, pervious asphalt, and permeable pavers) for driveways. The City also allows two-track driveways.
5.03.D.	Requirements for placing planter strip next to the curb.	The City requires a root barrier for trees planted next to the curb.
7.01.C.	<b>Drainage Conflicts</b> Where technical conflicts may occur between this document and the Surface Water Design Manual, the County Road Engineer shall decide which document governs.	Where technical conflicts may occur between this document and the KCSWDM as amended by the Addendum to the KCSWDM, the Public Works Director or designee shall decide which document governs.
9.02	All roadway and drainage infrastructures must be inspected. Subgrade inspection will not commence until density tests confirm that the compaction is in accordance with the specifications. Prior to any critical task being started the applicant/developer must schedule in advance with LUIS (206) 296-6642: At a minimum the following critical tasks require advance notification:	The City identifies the following as additional critical tasks: N. Inspect, prior to clearing and construction, all permitted development sites that have a high potential for sediment transport as determined through plan review O. Inspect all permitted development sites during construction to verify proper installation and maintenance of required erosion and sediment controls. P. Inspect all permitted development sites upon completion of construction and prior to final approval or occupancy to ensure proper installation of permanent stormwater facilities. Verify that a maintenance plan is completed and responsibility for maintenance is assigned for stormwater treatment and flow control BMPs/facilities.
9.05.B.2.	<b>Compaction Reports</b> Compaction reports are required for all projects. The reports shall include a sketch showing the locations the tests were taken. Compaction testing shall be accomplished as backfill or embankment construction progresses. At a minimum, compaction tests are required at the following locations. Additional tests and/or shorter intervals may be required by the inspector.	Compaction reports are also required for LID BMP installations, including bioretention and permeable pavement, as required by the KCSWDM as amended by the Addendum to the KCSWDM.
9.07.C.	Haul Routes	Haul routes are prohibited on permeable pavement streets, unless approved by the Public Works Director, or designee.

City Revisions to the King County Road Standards		
KCRS Reference	KCRS Existing Requirement	City Specific Revision
Figure 5-013	Minor fill around trees	The City requires one of the following modifications to preserve gas exchange and avoid burying the tree trunk: 1. Additional perforated aeration system connected to the gravel around collar of tree or 2. Extending gravel around the tree trunk up to soil surface.

### 1.3 Supplemental Documents

This section identifies technical guidance manuals and documents which shall be used to supplement the KCRS.

**Stormwater Standard Plans** – The City of Tacoma Standard Plans currently found at [www.cityoftacoma.org/government/city\\_departments/public\\_works/engineering/city\\_of\\_tacoma\\_right\\_of\\_way\\_design\\_manual](http://www.cityoftacoma.org/government/city_departments/public_works/engineering/city_of_tacoma_right_of_way_design_manual) are approved by the City of SeaTac on a conceptual basis. City of SeaTac development review staff will work with applicants to review and implement these standard details.

### 1.4 Code Reference Table

King County Code (KCC) is referenced in several places in the KCRS. The following table identifies these code references and equivalent SeaTac Municipal Code (SMC) where applicable.

King County Code to SeaTac Municipal Code (SMC) Reference Table			
KCC Reference	Subject of Reference	SMC Equivalent	Comment
Title 9	Surface Water Management	Title 12	KCRS 1.06 General References
KCC 9.04	Drainage, erosion/sedimentation control and sensitive areas	No Equivalent	See Addendum to KCSWDM
KCC 13.04.230	Water & Sewer Systems	Title 12	
Title 14	Roads and Bridges	Title 11	KCRS 1.06 General References
KCC 14.40	ROW vacation process	11.05.090	
Title 16	Building and Construction Standards	Title 13	KCRS 1.06 General References
Title 17 or KCC 17	Fire Code and Fire access requirements (Driveways)	Title 13.150	KCRS 1.06 General References



<b>King County Code to SeaTac Municipal Code (SMC) Reference Table</b>			
<b>KCC Reference</b>	<b>Subject of Reference</b>	<b>SMC Equivalent</b>	<b>Comment</b>
Title 19A	Subdivisions	Title 14	KCRS 1.06 General References
KCC 19A.08.130	Vertical and horizontal survey controls	14.26.050	
Title 20	Planning	No Equivalent	KCRS 1.06 General References
KCC 20.62	Avoid impacts to cultural resources	No Equivalent	
Title 21A or KCC 21A	Zoning	Title 15	KCRS 1.06 General References
KCC 23	Enforcement	1.15	
Title 27	Variance review fee	No Equivalent	Variance fees are outlined in the City's adopted fee schedule.
Title 27A (KC ordinance 12020)	Financial Guarantees	Title 3	KCRS 1.06 General References
Titles 46 and 47	Traffic	Title 9	KCRS 1.06 General References

# Section 2. Addendum to the 2016 WSDOT Standard Specifications for Road, Bridge, and Municipal Construction

## 2.1 Terminology

At times WSDOT and the City use different terminology to describe or to refer to equivalent subject matter. This section identifies these terms and the City's equivalent terminology.

**All Regional Administrators of the Department** = Public Works Director or designee

**County Engineer** = Public Works City Engineer or designee

**Contracting Agency** = City of SeaTac

**Ecology's Stormwater Management Manuals** = King County Surface Water Design Manual (KCSWDM) as amended by the City Addendum to the KCSWDM.

**Engineer** = Public Works City Engineer or designee

## 2.2 Key Revisions

This section identifies revisions the City has made to the WSDOT Standard Specifications for Road, Bridge, and Municipal Construction. These revisions are necessary to meet the intent of the LID Code Review and revision requirement in the NPDES Municipal Stormwater Phase II Permit and to address differences between WSDOT and City procedures.

### 2.2.1 General Revisions

**Soil Amendments** – The City requires soil amendments for disturbed areas in accordance with the KCSWDM as amended by the City Addendum to the KCSWDM. This requirement amends sections including, but not limited to, 8-02.3(6).

**Compaction Requirements for Permeable Pavement Base Course** – The City allows 90-92 percent compaction and deviations in base course requirements for permeable pavement as documented in WSDOT's GSPs (see Permeable Pavement Guidance below). This requirement amends sections including, but not limited to, 2-03.3(14)C, 7-08.3, and 7-09.3(11).

**Compaction Requirements for Bioretention** – The City allows 85 compaction for bioretention facilities. This requirement amends sections including, but not limited to, 2-03.3(14)C, 7-08.3, and 7-09.3(11).

**Curb and Gutter Exemptions** – Curb cuts and grates can be incorporated to allow water to enter stormwater facilities and LID BMPs. This requirement amends sections including, but not limited to, 8-04.3.

**Permeable Pavement Guidance** – The City allows the use of WSDOT's General Special Provisions (GSPs) for Porous Hot Mix Asphalt (PHMA), Porous Warm Mix Asphalt (PWMA),

and Pervious Concrete (PConcrete) developed by the Construction Materials Committee of the American Public Works Association (APWA) Washington dated March 9, 2016. These GSPs are included in Appendix B of this document.

## 2.2.2 Specific Revisions

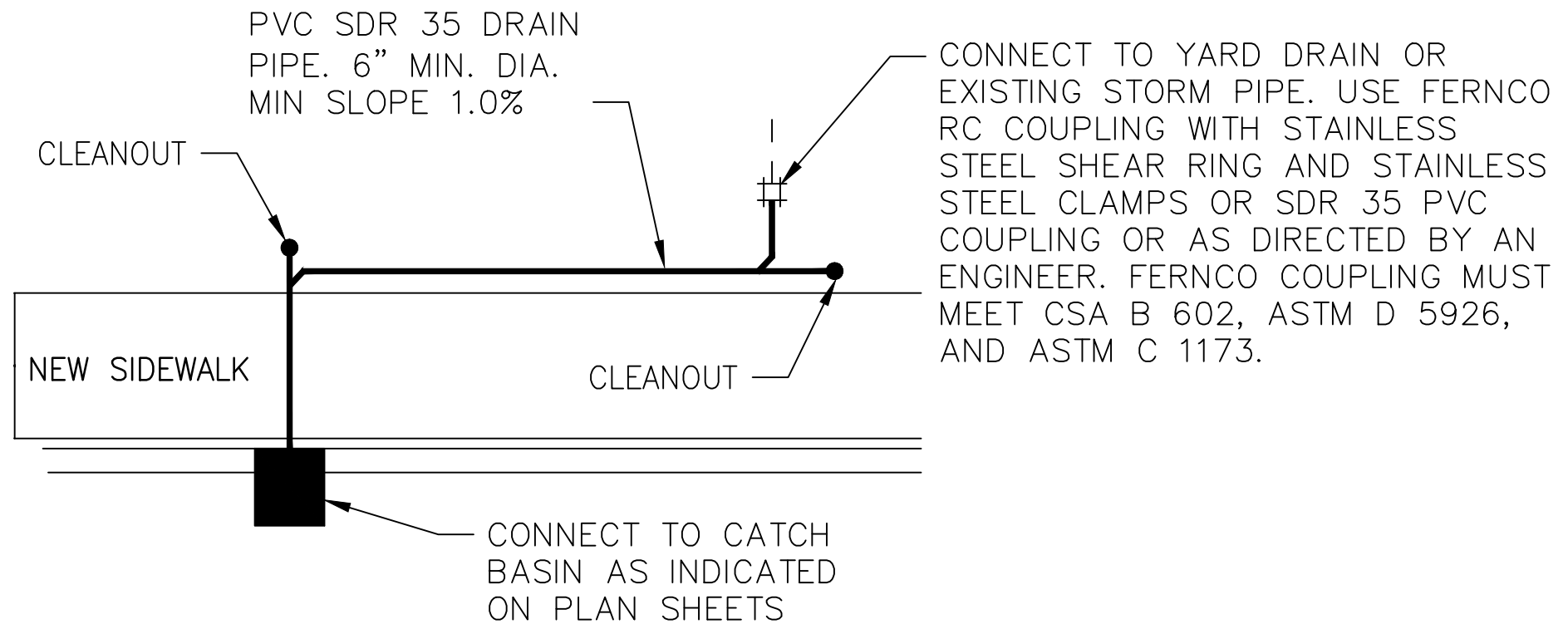
<b>City Revisions to the WSDOT Standard Specifications</b>		
<b>WSDOT Reference</b>	<b>WSDOT Existing Requirement</b>	<b>City Specific Revision</b>
1-02.9	Delivery of Proposal	Refer to Requests for Proposals for bid submittal instructions.
2-01.3(1)	Clearing, Grubbing, and Roadside Clean Up - Clearing	Where the clearing requirements in 2-01.3(1) are in conflict with SMC, Chapter 13.190 (Clearing and Grading Code) and SMC, Chapter 15.445.430 (Tree Retention – Clearing of Multi-Family, Commercial, and Industrial Zoned Lots), the SMC governs.
2-03.3(10)	Roadway Excavation and Embankment – Selected Material - Stockpiling	The City allows stockpiling of excavated materials for use on site if it meets organic matter and pH requirements specified in the Soil Amendment Standards in Appendix B of the Addendum to the KCSWDM. Laboratory testing may be required.
7-01.3(2)	Drains - Underdrain pipe	Refer to the KCSWDM as amended by the Addendum to the KCSWDM for underdrain pipe design criteria for bioretention and permeable pavement.
8-01.3(1)D	Erosion Control and Water Pollution Control - Dispersion/ Infiltration	The City requires that construction of dispersion/ infiltration areas are protected from compaction and sedimentation in accordance with the KCSWDM as amended by the City's Addendum to the KCSWDM.
8-02.3(2)A	Roadside Restoration – Roadside Work Plan	Refer to the KCSWDM as amended by the Addendum to the KCSWDM.
8-02.3(3)B	Roadside Restoration – Chemical Pesticides	Refer to the KCSWDM as amended by the Addendum to the KCSWDM and the City's Integrated Pest Management Plan (IPMP).
8-02.3(8)	Roadside Restoration – Planting Timing	The City supplements the planting timings defined in this section with the following:  “unless otherwise specified in the KCSWDM and the City's Addendum to the KCSWDM.”
8-14	Cement Concrete Sidewalks	Porous concrete is also allowed for sidewalks unless otherwise specified by the City. Silva cells under cement concrete sidewalk are preferred to porous concrete sidewalk.
9-14	Erosion Control and Roadside Planting	Refer to the KCSWDM as amended by the Addendum to the KCSWDM.

<b>City Revisions to the WSDOT Standard Specifications</b>		
<b>WSDOT Reference</b>	<b>WSDOT Existing Requirement</b>	<b>City Specific Revision</b>
9-14.4(8)	Compost specifications	The City requires compost to meet the requirements in the KCSWDM and the City's Addendum to the KCSWDM.
9-20	Concrete Patching Material, Grout, and Mortar	Existing permeable pavements must use steel plates for temporary patching. Permeable pavement shall be replaced in-kind where feasible. Patching porous asphalt with conventional asphalt is acceptable if it is less than 10 percent of the total facility area and does not impact the overall facility function. Take appropriate precautions during pavement repair and replacement efforts to prevent clogging of adjacent surfaces. Base aggregates shall be washed crushed aggregate. Permeable pavement shall conform to the requirements outlined in the WSDOT GSPs for permeable pavement. City inspection approval of the setup for the permeable pavement patch repair is required prior to commencing work.



# **Appendix A – City Road and Stormwater Standard Details**





**NOTES:**


1. PROVIDE CLEANOUT AT ALL BENDS
2. CONNECT YARD DRAINS AS SHOWN ON THE PLAN SHEETS.
3. MAXIMUM 100' BETWEEN CLEANOUTS.

**TYPICAL AREA DRAIN CONNECTION**

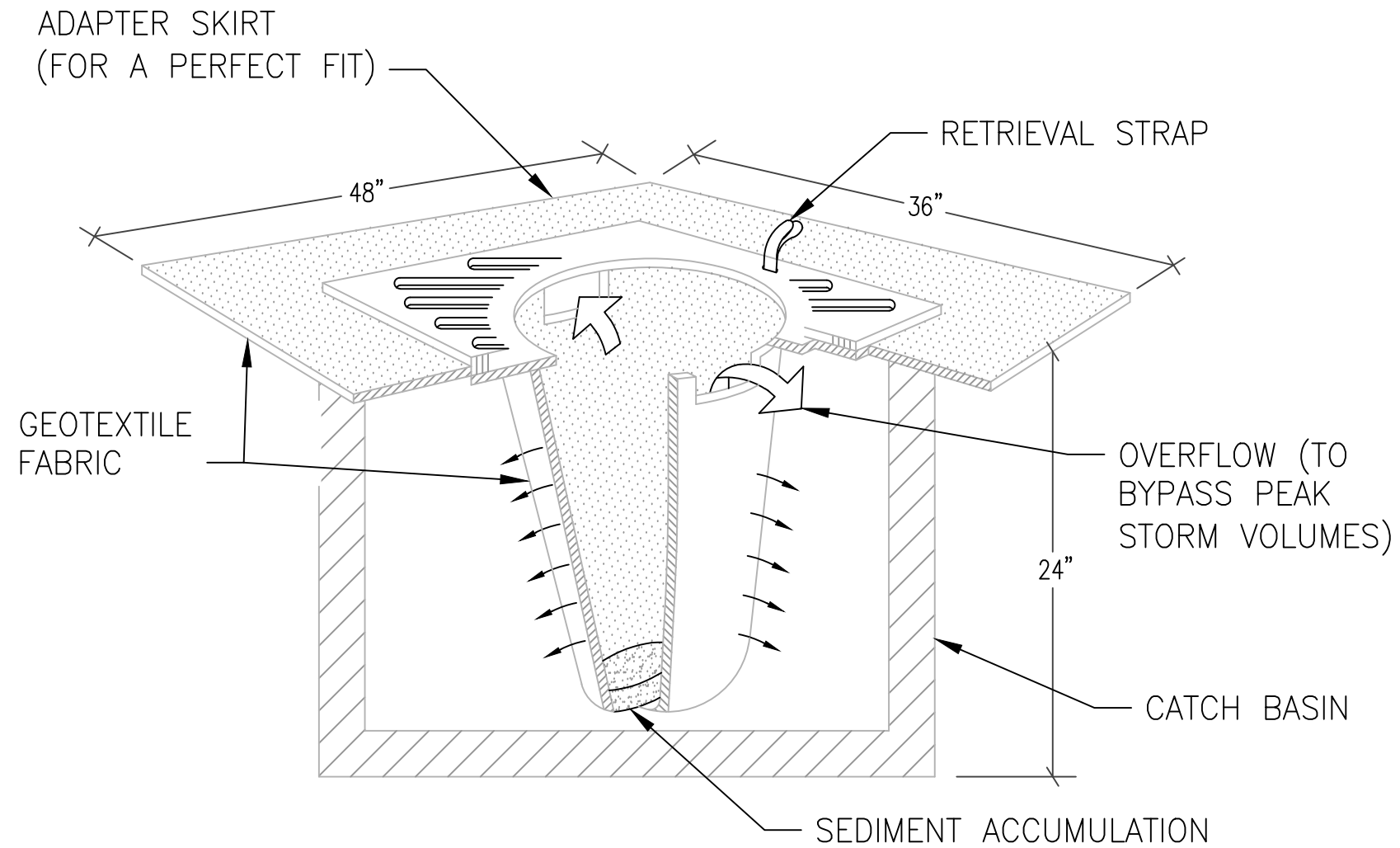
**DETAIL**

NO SCALE

4

NO.	DATE	BY	APPR.	REVISION	<div><div></div><div><div>Public Works Department</div><div>Tom Gut, P.E., Public Works Director</div><div>Susan Sanderson, P.E., City Engineer</div></div><div><div>4800 South 188th Street, SeaTac, Wa 98188-8605</div><div>Telephone: (206) 973-4730, Engineering Division</div></div></div>			CITY OF SEATAC			SHEET NO:	
								24TH AVENUE SOUTH OVERLAY PROJECT		20		
								PARALLEL CURB RAMP				
								DETAILS				
								DATE: 03/06/2015		20 OF 20		
								JOB # ST-884				
								SCALE: NTS				
					DRN. TK	DSGN. TK	CHKD. EAP					






## STORM DRAIN INLET PROTECTION

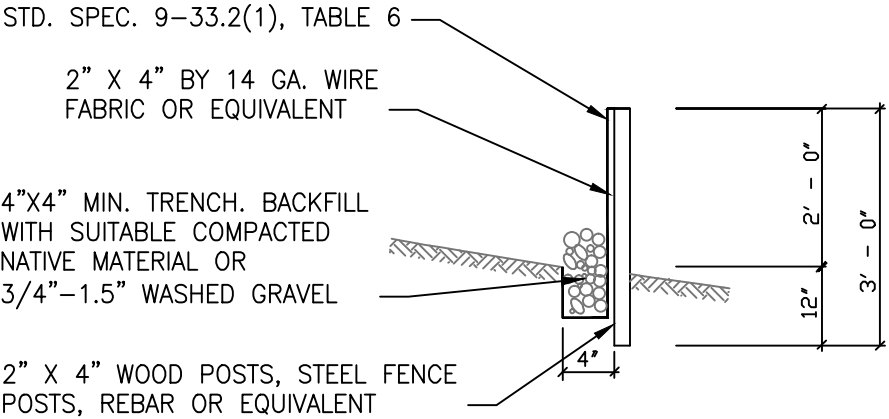
### DETAIL

2

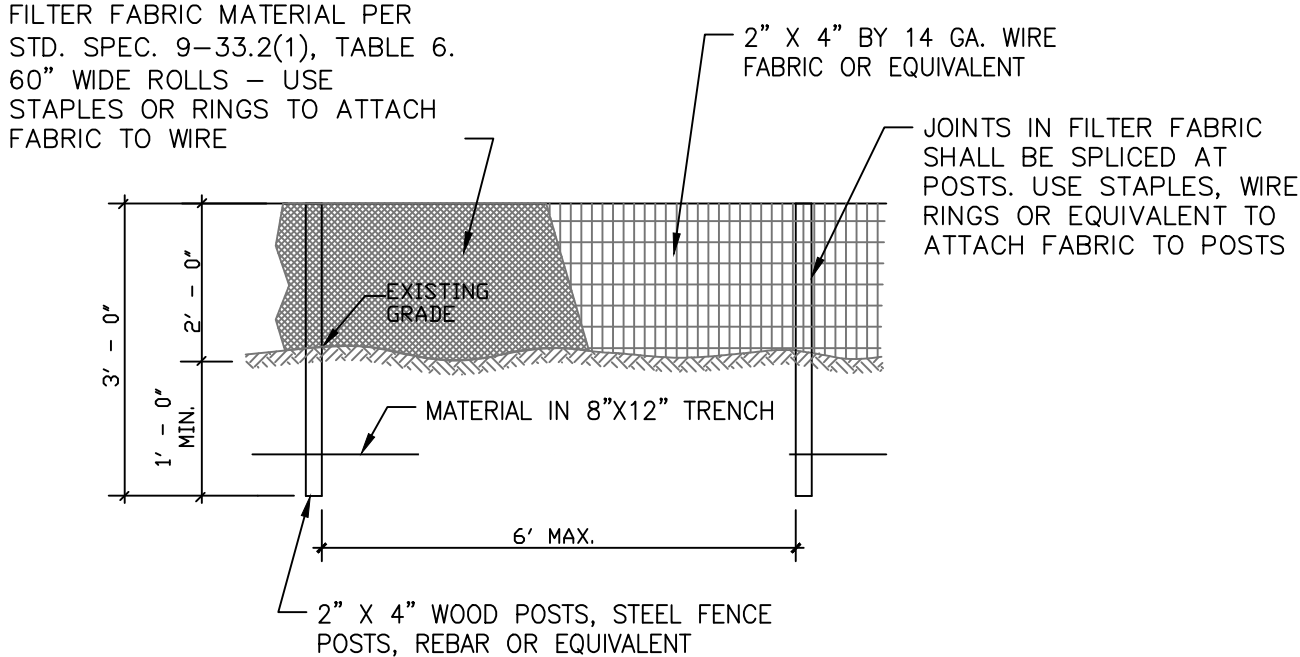
NO SCALE

NO.	DATE	BY	APPR.	REVISION		<div><div><b>Public Works Department</b> Tom Gut, P.E., Public Works Director Susan Sanderson, P.E., City Engineer</div><div>4800 South 188th Street, SeaTac, Wa 98188-8605 Telephone: (206) 973-4730, Engineering Division</div></div>	<div><b>CITY OF SEATAC</b> <b>24TH AVENUE SOUTH OVERLAY PROJECT</b> <b>PARALLEL CURB RAMP</b> <b>DETAILS</b></div>			SHEET NO: <div>20</div>	
										20 OF 20	
					DRN. TK	DSGN. TK	CHKD. EAP	DATE: 03/06/2015		JOB # ST-884	SCALE: NTS





CROSS SECTION



ELEVATION

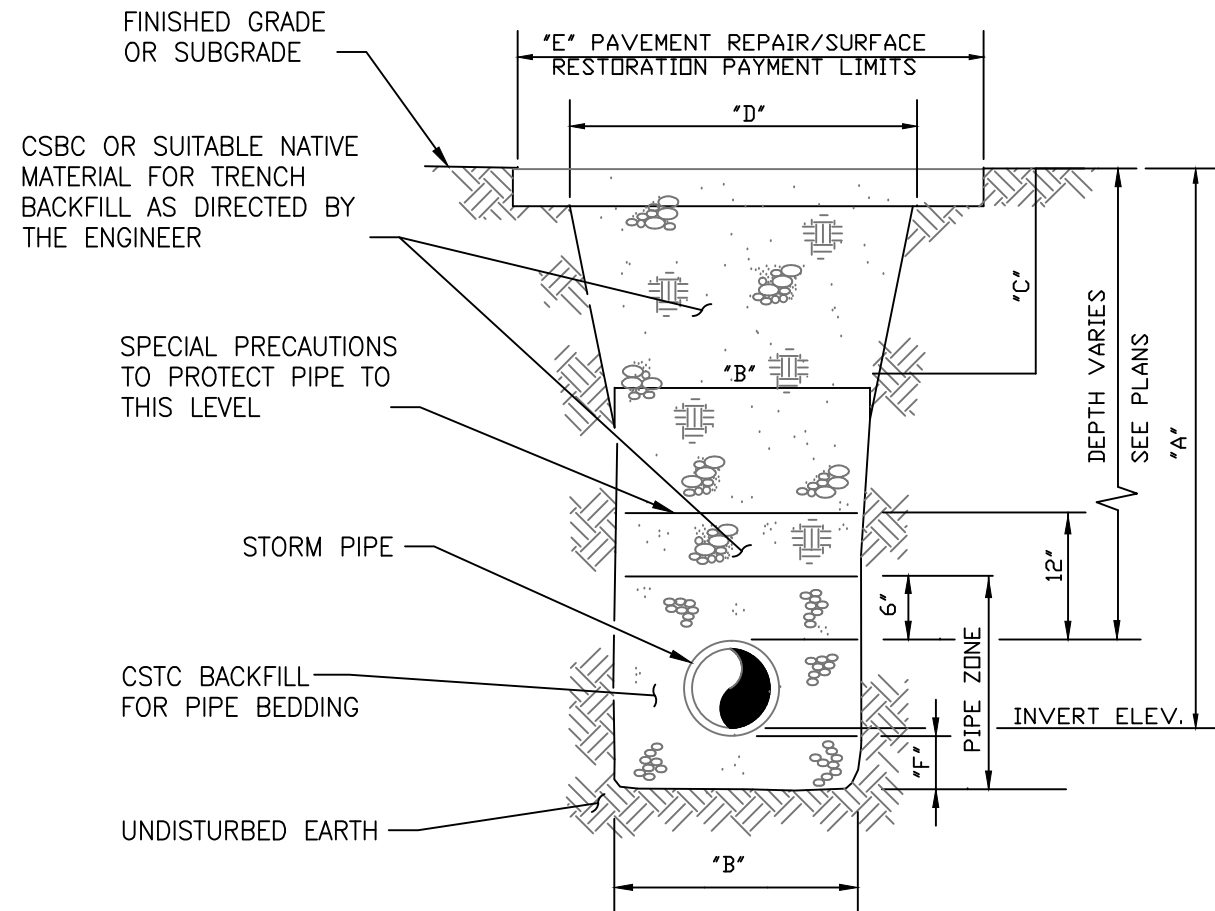
NOTES

- 1. MAXIMIZE DETENTION OF STORMWATER BY PLACING FENCE AS FAR AWAY FROM TOE OF SLOPE AS POSSIBLE WITHOUT ENCROACHING ON SENSITIVE AREAS OR OUTSIDE OF THE CLEARING BOUNDARIES.
- 2. INSTALL SILT FENCING ALONG CONTOURS WHENEVER POSSIBLE.
- 3. INSTALL THE ENDS OF THE SILT FENCE TO POINT SLIGHTLY UP-SLOPE TO PREVENT SEDIMENT FROM FLOWING AROUND THE ENDS OF THE FENCE.
- 4. PERFORM MAINTENANCE IN ACCORDANCE WITH STANDARD SPECIFICATIONS 8.01.3(9)A AND 8.01.3(15).
- 5. POST SPACING MAY BE INCREASED TO BE 8' IF WIRE BACKING IS USED.

SILT FENCE  
DETAIL

NO SCALE

1

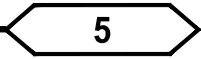


ALL OPEN TRENCHES SHALL BE NON-SKID PLATED, PINNED, SHIMMED, (SUITABLE FOR H2O LOADING) OR BACKFILLED AND CAPPED WITH TEMPORARY HMA WHERE AUTHORIZED BY THE CITY AT THE END OF EACH WORK DAY.

- NOTES:**
1. THE TRENCH SECTIONS SHOWN ON THE PLANS ARE FOR THE PAYMENT LIMITS FOR CSBC FOR TRENCH BACKFILL. PAYMENT FOR ALL CSBC FOR TRENCH BACKFILL SHALL BE COMPUTED FROM THE MEASUREMENT OF THE CONSTRUCTED TRENCH SECTION, TO THE MAXIMUM LIMITS AS INDICATED IN THE TABLES.
  2. WHERE A "NEW ROADWAY SECTION" OR PAVEMENT REPAIR IS PROPOSED, THE TRENCH SECTION PAYMENT LIMIT LINE WILL BE BOUNDED AT THE TOP BY SUBGRADE, PER TYPICAL ROADWAY SECTION DETAILS.

TYPICAL TRENCH EXCAVATION LIMITS STORM SEWER PIPE					
PIPE DIAMETER(IN)	6 TO 8	12	18	24	36
A	8' OR LESS				
B	2.50'	3.00'	3.75'	4.50'	6.00'
C	1.50'				
D	5.50'	6.00'	6.75'	7.50'	9.00'
E	6.50'	7.00'	7.75'	8.50'	10.00'
F	4 IN		6 IN		

**STORM PIPE TRENCH SECTION  
DETAIL**  
NO SCALE



NO.	DATE	BY	APPR.	REVISION

DRN. TK	DSGN. TK	CHKD. EAP

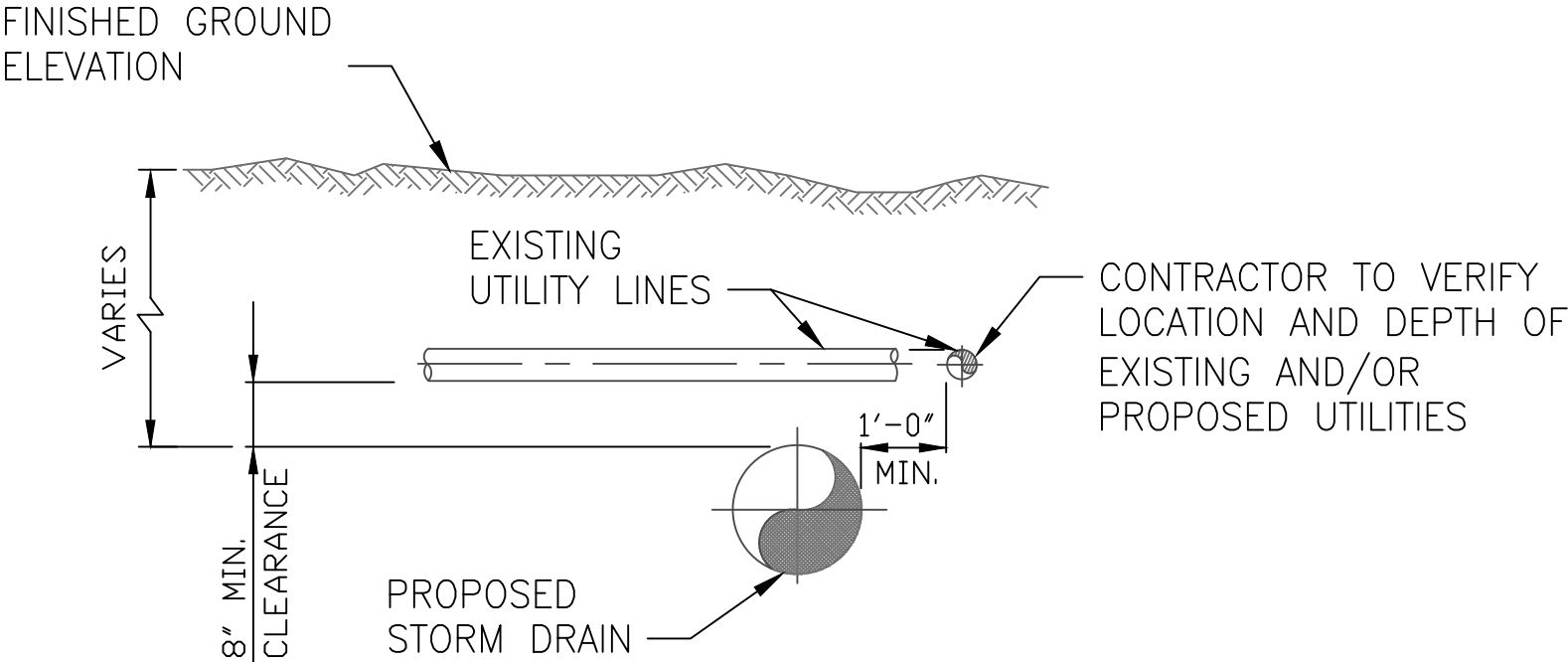


**Public Works Department**  
 Tom Gut, P.E., Public Works Director  
 Susan Sanderson, P.E., City Engineer  
 4800 South 188th Street, SeaTac, Wa 98188-8605  
 Telephone: (206) 973-4730, Engineering Division

**CITY OF SEATAC**  
**24TH AVENUE SOUTH OVERLAY PROJECT**  
**PARALLEL CURB RAMP**  
**DETAILS**

DATE: 03/06/2015    JOB # ST-884    SCALE: NTS

SHEET NO:  
**20**  
 20 OF 20

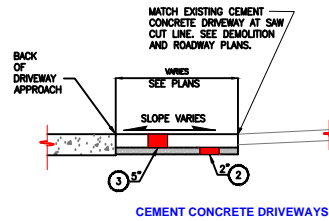
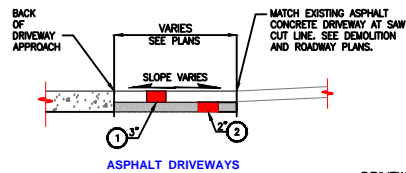


NOTE: CONCRETE ENCASEMENT (BEDDING) SHALL BE UTILIZED AT LOCALIZED UTILITY CROSSING IF MINIMUM PIPE SEPARATION (ELEVATION) CANNOT BE MAINTAINED / ACHIEVED.

**TYPICAL UTILITY CROSSING  
DETAIL**

NO SCALE

**3**

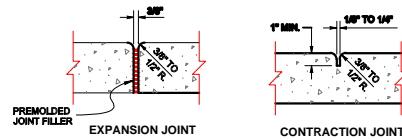


#### DRIVEWAY NOTES:

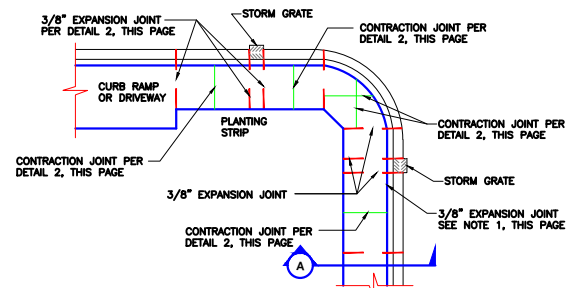
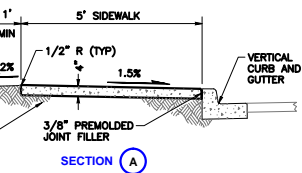
1. ACCESS TO ALL PROPERTIES SHALL BE PROVIDED TO RESIDENTS AT ALL TIMES.
2. DETAILS SHOWN ARE TYPICAL. THE ENGINEER RESERVES THE RIGHT TO ADJUST WORK TO ACCOMMODATE FIELD CONDITIONS.

1. COMMERCIAL HMA
2. CRUSHED SURFACING TOP COURSE
3. CLASS 4000 CEMENT CONCRETE PAVEMENT

#### DRIVEWAY REPAIR DETAIL NO SCALE



#### CEMENT CONCRETE JOINTS DETAIL NO SCALE



#### VERTICAL CURB & SIDEWALK

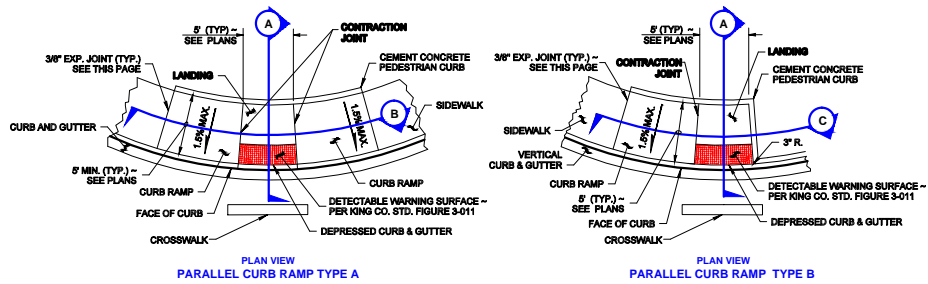
#### NOTE

1. 1" EDGED GROOVE MAY REPLACE 3/8" EXPANSION JOINT AT INTERFACE BETWEEN CURB AND ADJACENT SIDEWALK FOR SEPARATE POUR CONSTRUCTION. SEE PROJECT SPECIFICATIONS FOR JOINT REQUIREMENTS.
2. GRATINGS, ACCESS COVERS, JUNCTION BOXES, CABLE VAULTS, PULL BOXES AND OTHER APPURTENANCES WITHIN THE SIDEWALK MUST HAVE SLIP RESISTANT SURFACES, BE FLUSH WITH SURFACE, AND MATCH GRADE OF THE SIDEWALK.
3. ALL CONCRETE SHALL BE "CLASS 4000"

#### LEGEND

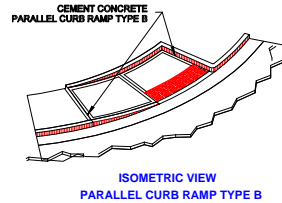
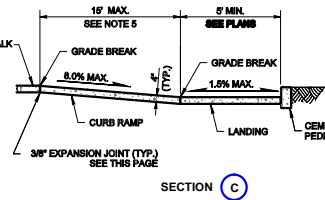
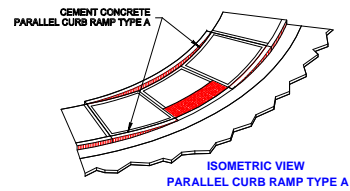
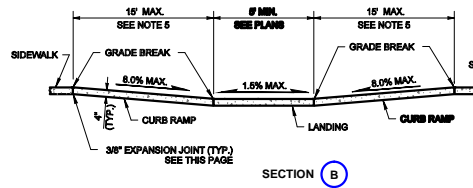
- SLOPE IN EITHER DIRECTION
- 3/8" EXPANSION JOINT ALONG CURB AT MAX. 10' O.C.
- CONTRACTION JOINT AT 5' O.C. PER DETAIL 2, THIS PAGE

#### CEMENT CONCRETE SIDEWALK AND JOINTS DETAIL NO SCALE

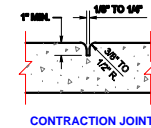
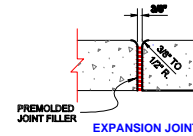
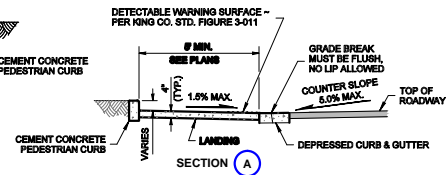


#### NOTES

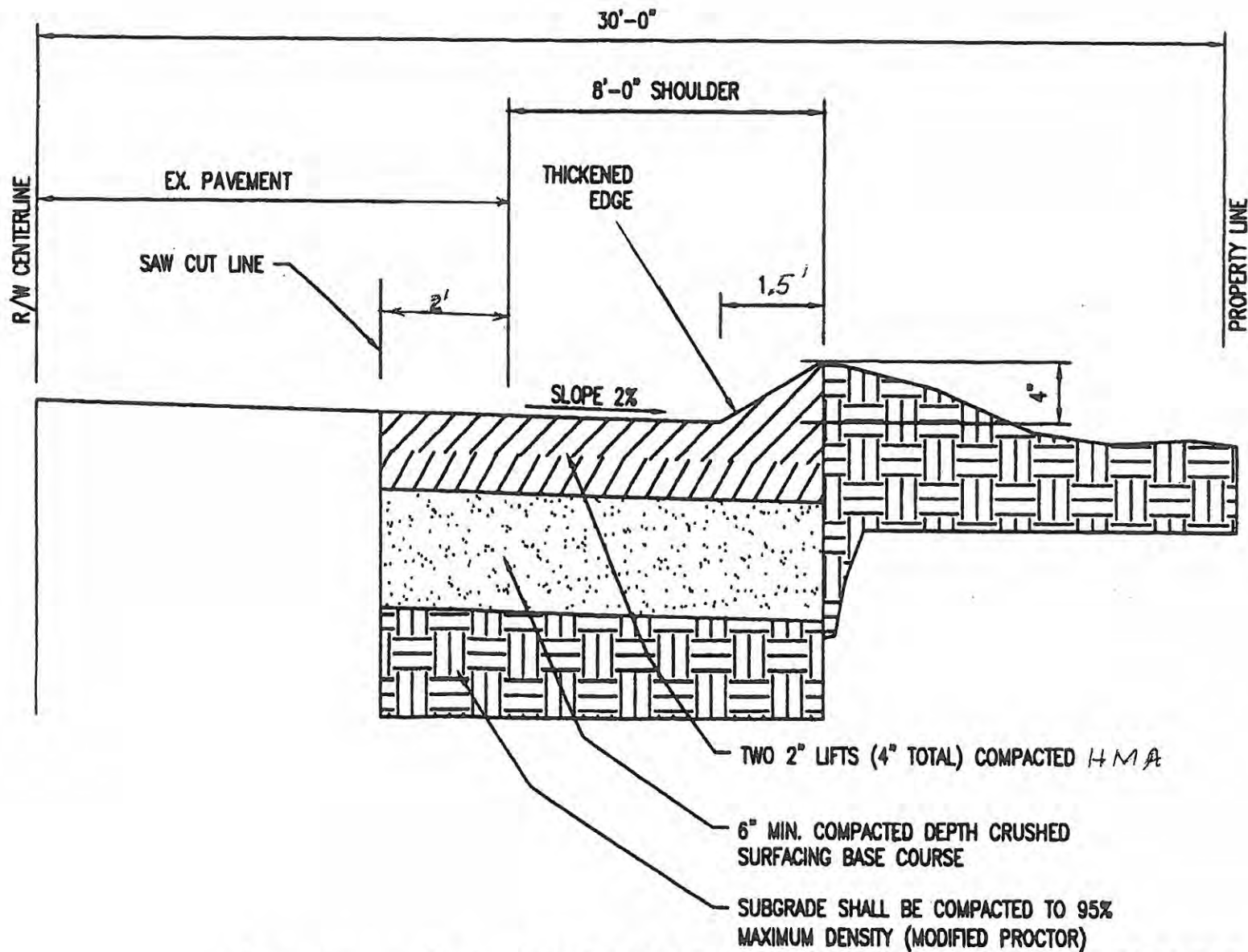
1. CURB RAMP LOCATION SHALL BE PLACED WITHIN THE WIDTH OF THE ASSOCIATED CROSSWALK, OR AS SHOWN IN THE PLANS.
2. WHERE "GRADE BREAK" IS CALLED OUT, THE ENTIRE LENGTH OF THE GRADE BREAK BETWEEN THE TWO ADJACENT SURFACE PLANS SHALL BE FLUSH.
3. GRATINGS, JUNCTION BOXES, ACCESS COVERS OR OTHER APPURTENANCES SHALL NOT BE LOCATED IN FRONT OF THE CURB RAMP OR ANY OTHER PART OF THE CURB RAMP OR LANDING.
4. THE CURB RAMP, LANDING, AND PLACES SHALL BE BROOM FINISHED PER PROJECT SPECIFICATIONS.
5. THE CURB RAMP MAXIMUM RUNNING SLOPE SHALL NOT EXCEED THE RAMP LENGTH TO EXCEED 15 FEET TO AVOID CHANGING THE SLOPE INDISTINGUISHABLY WHEN CONNECTING TO STEEP GRADES. WHEN APPLYING THE 15 FOOT MAXIMUM LENGTH, THE RUNNING SLOPE OF THE CURB RAMP SHALL BE AS FLAT AS FEASIBLE.
6. THE BID ITEM "CEMENT CONCRETE PARALLEL CURB RAMP TYPE A" DOES NOT INCLUDE THE ADJACENT CURB AND GUTTER, PEDESTRIAN CURB AND SIDEWALK.



LEGEND  
SLOPE IN EITHER DIRECTION

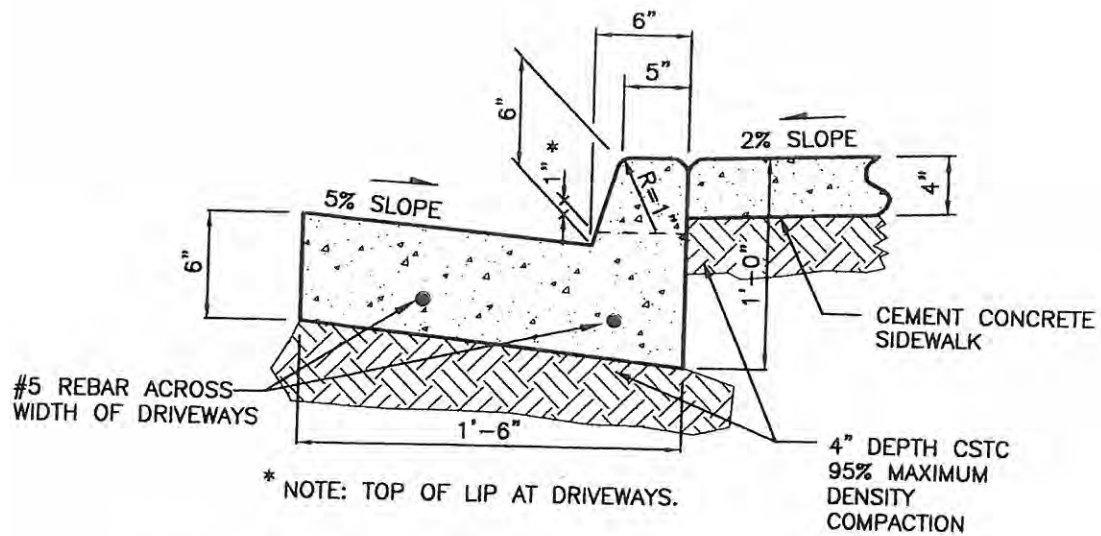


PARALLEL CURB RAMP



SECTION A-A FRONTAGE IMPROVEMENTS  
 NTS

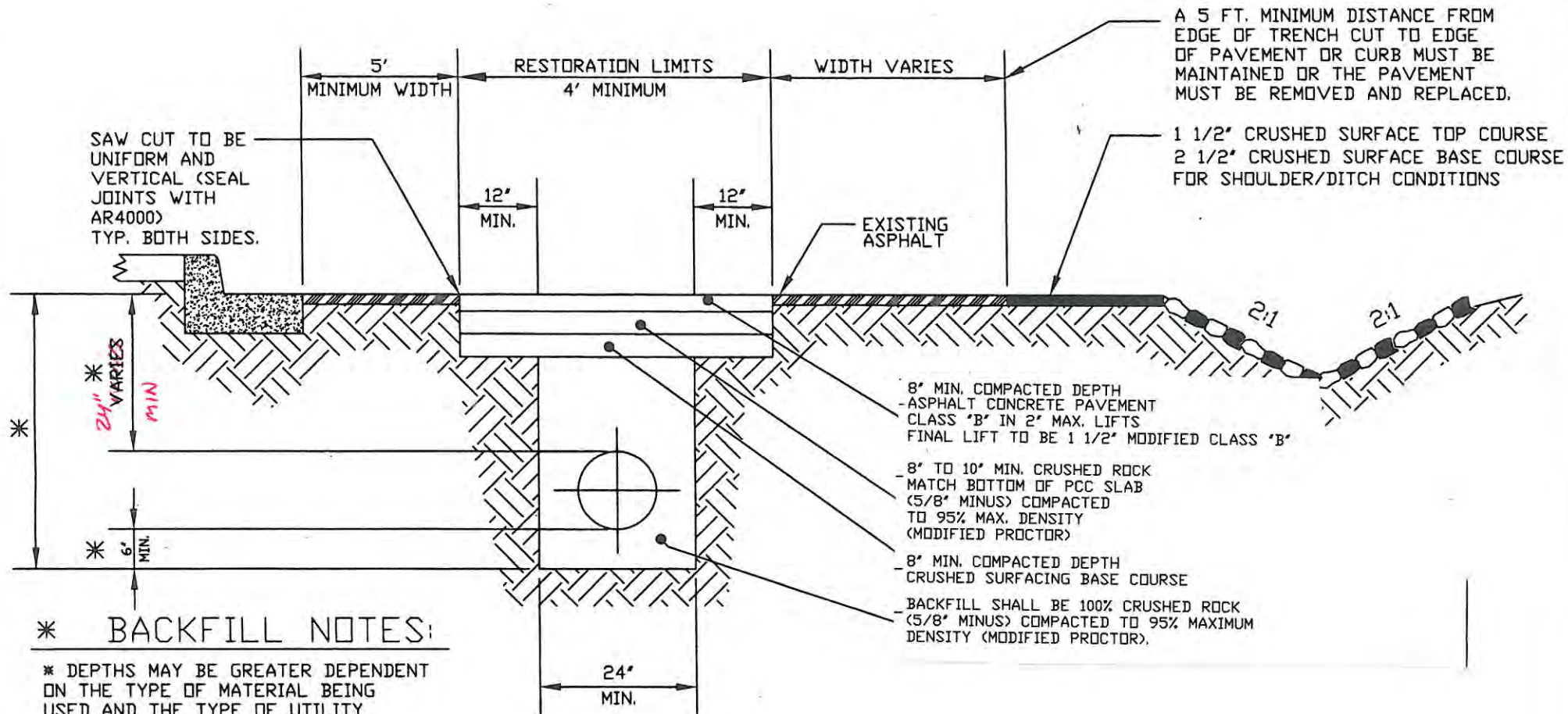




NOTES:

1. SEE SEC. 3.04 K.C.R.S. FOR JOINT REQUIREMENTS.
2. ROLL GUTTER TO MATCH POSITIVE SUPERELEVATION.
3. SEE DRAWING NO. 1-006 FOR CONFIGURATION OF FILL & WALKWAY BEHIND CURB IF REQUIRED.
4. SEE SEC. 3.03 FOR EXTRUDED CURB ANCHORAGE.

## CEMENT CONCRETE VERTICAL CURB & GUTTER



### \* BACKFILL NOTES:

\* DEPTHS MAY BE GREATER DEPENDENT ON THE TYPE OF MATERIAL BEING USED AND THE TYPE OF UTILITY BEING CONSTRUCTED.

\* TRENCH BACKFILL IS TO BE 100% CRUSHED, EXCEPT THOSE TRENCHES PARALLEL TO THE RIGHT-OF-WAY CENTERLINE THAT ARE GREATER THAN 100 FT. IN LENGTH AND THOSE TRENCHES THAT ARE OUTSIDE PAVED OR IMPROVED AREAS. THE CITY WILL CONSIDER TRENCHES GREATER THAN 100 FT. IN LENGTH AND AREAS UNDER PAVEMENT AND OTHER RIGHT-OF-WAY IMPROVEMENTS ON A CASE BY CASE BASIS. FACTORS TO CONSIDER INCLUDE GEOTECH REPORTS AND COMPACTION TESTING UNDER PAVED AND IMPROVED AREAS AND POTENTIAL FUTURE IMPROVEMENTS OUTSIDE EXISTING IMPROVED AREAS.

### NOTES:

1. DAMAGE TO PAVEMENT SURFACE SEAL COATS DURING BACKFILL OPERATIONS WILL REQUIRE THAT A FOG SEAL OF CSS-1 AT THE RATE OF 0.05 TO 0.10 (0.03 TO 0.05 RESIDUAL) GALLONS PER SQUARE YARD BE APPLIED TO THE PAVEMENT TO RETURN THE PAVEMENT SEAL TO ORIGINAL OR BETTER CONDITION. ADDITIONAL STRUCTURAL DAMAGE TO THE PAVEMENT SHALL REQUIRE BUT NOT BE LIMITED TO SQUARE CUT PATCHING AND OR OVERLAYS.
2. DITCH SIDE SLOPES AND FLOW LINE ARE TO BE STABILIZED BY PLACING RIP RAP OR OTHER TREATMENTS AS REQUIRED BY THE PUBLIC WORKS DIRECTOR'S REPRESENTATIVE.



### Public Works Department Engineering Division

Dale Schroeder, P.E., Director

4800 S. 188th St., SeaTac, WA 98188-8605  
Telephone: 206-973-4730

CHECKED: DLS

DRAWN: DLH

REV.: 8/30/2006

DATE: 9/1/1994

K: \ENGR\CADD\DETAILS\SR\_1

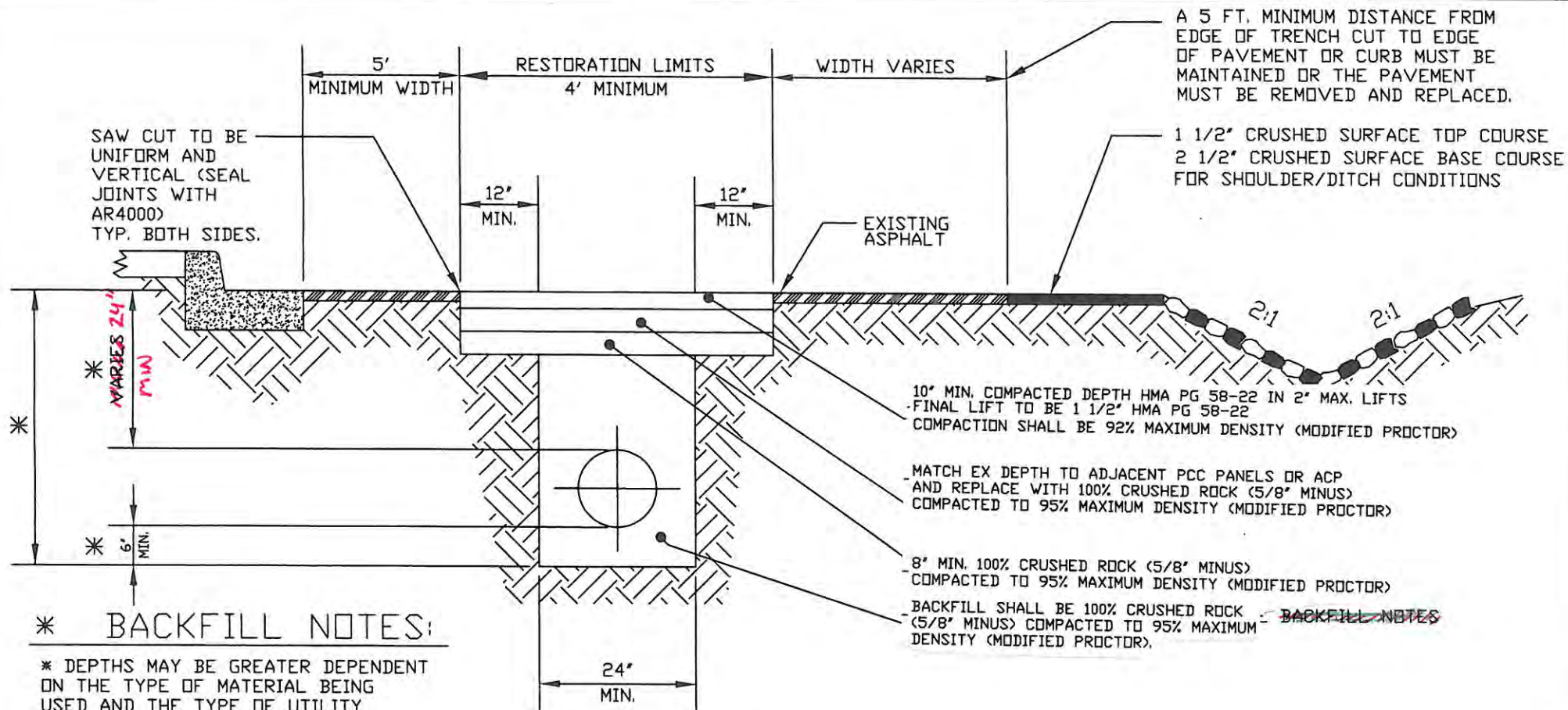
ARTERIAL  
NEIGHBORHOOD STREET  
TYP. ROADWAY REPAIR

DETAIL NO. SR-1









### \* BACKFILL NOTES:

\* DEPTHS MAY BE GREATER DEPENDENT ON THE TYPE OF MATERIAL BEING USED AND THE TYPE OF UTILITY BEING CONSTRUCTED.

\* TRENCH BACKFILL IS TO BE 100% CRUSHED, EXCEPT THOSE TRENCHES PARALLEL TO THE RIGHT-OF-WAY CENTERLINE THAT ARE GREATER THAN 100 FT. IN LENGTH AND THOSE TRENCHES THAT ARE OUTSIDE PAVED OR IMPROVED AREAS. THE CITY WILL CONSIDER TRENCHES GREATER THAN 100 FT. IN LENGTH AND AREAS UNDER PAVEMENT AND OTHER RIGHT-OF-WAY IMPROVEMENTS ON A CASE BY CASE BASIS. FACTORS TO CONSIDER INCLUDE GEOTECH REPORTS AND COMPACTION TESTING UNDER PAVED AND IMPROVED AREAS AND POTENTIAL FUTURE IMPROVEMENTS OUTSIDE EXISTING IMPROVED AREAS.

### NOTES:

1. DAMAGE TO PAVEMENT SURFACE SEAL COATS DURING BACKFILL OPERATIONS WILL REQUIRE THAT A FDG SEAL OF CSS-1 AT THE RATE OF 0.05 TO 0.10 (0.03 TO 0.05 RESIDUAL) GALLONS PER SQUARE YARD BE APPLIED TO THE PAVEMENT TO RETURN THE PAVEMENT SEAL TO ORIGINAL OR BETTER CONDITION. ADDITIONAL STRUCTURAL DAMAGE TO THE PAVEMENT SHALL REQUIRE BUT NOT BE LIMITED TO SQUARE CUT PATCHING AND OR OVERLAYS.
2. DITCH SIDE SLOPES AND FLOW LINE ARE TO BE STABILIZED BY PLACING RIP RAP OR OTHER TREATMENTS AS REQUIRED BY THE PUBLIC WORKS DIRECTORS REPRESENTATIVE.

- \* 3. COMPACTION TESTS FOR BACKFILL AND ASPHALT SHALL BE REQUIRED EVERY 25 FEET ALONG THE TRENCH BY AN INDEPENDANT CONTRACTOR.



## Public Works Department Engineering Division

Dale Schroeder, P.E., Director

4800 S. 188th St., SeaTac, WA 98188-8605  
Telephone: 206-973-4730

CHECKED: DLS

DRAWN: DLH

REV: 8/30/2006

DATE: 9/1/1994

K:\ENGR\CADD\DETAILS\SR\_1

INTERNATIONAL BLVD  
~~NEIGHBORHOOD STREET~~  
TYP. ROADWAY REPAIR

DETAIL NO. SR-1



## **Appendix B – WSDOT GSPs for Permeable Pavement**



- These GSPs may not be used on WSDOT Projects.
- See the [log of changes/additions](#) to these GSPs, for the reasons and history behind each GSP; this will give you guidelines for their use.
- These GSPs are written assuming the spec writer will include in their Bid Documents, all related Division 1 [Amendments to the Standard Specifications](#).
- Please read notes at [http://www.wsdot.wa.gov/partners/apwa/HMA-WMA\\_Notes.pdf](http://www.wsdot.wa.gov/partners/apwa/HMA-WMA_Notes.pdf) before using

## DIVISION 2

**2-06.3(3).RTF Subgrade for Permeable Pavements**  
 (March 9, 2016)  
 May be used on FHWA funded projects.  
 For use when specifying Permeable pavement.

**2-06.5.RTF Subgrade for Permeable Pavements**  
 (March 9, 2016)  
 May be used on FHWA funded projects.  
 For use when specifying Permeable pavement.

## DIVISION 4

**4-04.2(9-03.9(2)).OPT1.RTF Permeable Ballast**  
 (March 9, 2016)  
 May be used on FHWA funded projects.  
 Use when specifying Permeable pavements.

**4-04.2(9-03.9(2)).OPT2.RTF Crushed Surfacing Choker Course**  
 (March 9, 2016)  
 May be used on FHWA funded projects.  
 Use when specifying Permeable pavements.  
Optional - at the discretion of the Engineer. Use with 2-06.3 RTF and 4-04.2 opt1.RTF or, consider using Asphalt Treated Permeable Base over Permeable Ballast.

Do NOT use Crushed Surfacing Choker Course for Pervious Concrete installations. For Porous Asphalt you may want to consider Asphalt Treated Permeable Base (ATPB) instead of Crushed Surfacing Choker Course.

**4-04.2(9-03.9(2)).OPT3.RTF Aggregates for Permeable Base**  
 (March 9, 2016)  
 May be used on FHWA funded projects.  
 Must use with 4-04.2(9-03.9(2)).OPT1.rtf and/or 4-04.2(9-03.9(2)).OPT2.rtf.

**4-04.3(5).RTF Shaping and Compaction**  
 (March 9, 2016)  
 May be used on FHWA funded projects.



Use when specifying Porous HMA or Pervious Concrete.

Because of the high void content in the aggregates, there will be some displacement of the aggregate surface under load. Crushed Surfacing Choker Course is used to minimize the displacement in preparation for paving. The use of Asphalt Treated Permeable Base (ATPB) directly over the Permeable Ballast Base Course eliminates the need for Crushed Surfacing Choker Course.]

**4-04.4.RTF**

**Measurement**

(March 9, 2016)

May be used on FHWA funded projects.

Use when specifying Crushed Surfacing Choker Course.

**4-04.5.RTF**

**Payment**

(March 9, 2016)

May be used on FHWA funded projects.

Use when specifying Crushed Surfacing Choker Course.

**4-SA2.RTF**

**Asphalt Treated Permeable Base (ATPB)**

(March 9, 2016)

May be used on FHWA funded projects.

Optional - May be used as a Base for Porous Hot Mix Asphalt, when used, also use 2-06.3(3).rtf.

**DIVISION 5**

**5-04.1.RTF**

**Description**

(March 9, 2016)

**Hot Mix Asphalt**

May be used on FHWA funded projects.

Use when specifying Porous HMA.

**5-04.2(9-03.8).RTF**

**Materials**

(March 9, 2016)

**Aggregates for Porous Hot Mix Asphalt/Porous Warm Mix Asphalt (PHMA/PWMA)**

May be used on FHWA funded projects.

Use when specifying Porous HMA.

**5-04.3.RTF**

**Construction Requirements**

(March 9, 2016)

**Porous Asphalt (PHMA/PWMA) Acceptance Infiltration Test**

May be used on FHWA funded projects.

Use when specifying Porous HMA.

**5-04.3(1).RTF**

**Hot Asphalt Mixing Plant**

(March 9, 2016)

**Fiber Supply System**

May be used on FHWA funded projects.

Use when specifying Porous HMA.

<b>5-04.3(7)A.RTF</b>	<b>Mix Design</b> (March 9, 2016) May be used on FHWA funded projects. Use when specifying Porous HMA.
<b>5-04.3(8)A1.OPT2.RTF</b>	<b>General</b> (March 9, 2016) May be used on FHWA funded projects. Use when specifying Porous HMA.
<b>5-04.3(8)A6.OPT2.RTF</b>	<b>Test Methods</b> (March 9, 2016) May be used on FHWA funded projects.
<b>5-04.3(9).RTF</b>	<b>Spreading and Finishing</b> (March 9, 2016) May be used on FHWA funded projects. Use when specifying Porous HMA.
<b>5-04.3(10)A.RTF</b>	<b>General</b> (March 9, 2016) May be used on FHWA funded projects. Use when specifying Porous HMA.
<b>5-04.4.RTF</b>	<b>Measurement</b> (March 9, 2016) May be used on FHWA funded projects. Use when specifying Porous HMA.
<b>5-04.5.RTF</b>	<b>Payment</b> (March 9, 2016) May be used on FHWA funded projects. Use when specifying Porous HMA.
<b>5-06.SA.RTF</b>	<b>Pervious Concrete Pavement</b> (March 9, 2016) May be used on FHWA funded projects. When used, include 2-06.3(3).rtf, 4-04.2(9-03.9(2)).OPT1.rtf, or 4-04.2(9-03.9(2)).OPT1.rtf and 4-SA2.rtf or 4-04.2(9-03.9(2)).OPT2.rtf as sub base and base courses.

Add the following new section:

**2-06.3(3) Subgrade for Permeable Pavements**  
(March 9, 2016 APWA GSP)

Before placing permeable ballast for Porous HMA/WMA, the Contractor shall bring the Subgrade to the required line, grade, and cross-section. The Contractor shall compact the Subgrade to a depth of 6 inches to at least 90 percent, but not more than 92 percent, of the maximum density as determined by the compaction control tests described in Section 2-03.3(14)D. Two (2) density tests will be conducted for every 5,000 square feet of prepared subgrade; or four (4) tests per 200 lineal feet of roadway or sidewalk. All subgrade shall be firm and unyielding as determined by the Engineer.

The Contractor shall take measures to protect the prepared and approved subgrade from traffic, water run-on, standing water, or other damage. Subgrade that has been over compacted, shall be scarified to a minimum depth of eight (8) inches and recompact.

Material used to protect the Subgrade from traffic or provide access to adjacent facilities shall be removed and the subgrade compacted prior to placing geotextile, if used and/or permeable ballast.

**2-06.5 Measurement and Payment**  
*(March 9, 2016 APWA GSP)*

Supplement this section with the following:

Measurement for Subgrade for Permeable Pavement will be in accordance with 2-06.5.

**4-04.2 Gravel Base**  
(March 9, 2016 APWA GSP)

Revise section 9-03.9(2) to read:

***Permeable Ballast***

Permeable ballast shall meet the requirements of Section 9-03.9(1) for ballast except for the following special requirements.

The grading and quality requirements are:

Grading No. 1		Grading No. 2 (AASHTO No. 3)	
Sieve Size	Percent Passing	Sieve Size	Percent Passing
2-1/2"	99-100	2-1/2"	100
2"	65-100	2"	90-100
3/4"	40-80	1-1/2"	35-70
No. 4	0-5	1"	0-15
No. 100	0-2	1/2"	0-5
% Fracture	95	No. 100	0-3
All percentages are by weight.		% Fracture	95

The sand equivalent value and dust ratio requirements do not apply.

Los Angeles Wear, 500 Rev.      30% maximum  
Degradation Factor              30 minimum

The fracture requirement shall be at least two (2) fractured faces and will apply to the combined aggregate retained on the No. 4 sieve in accordance with WSDOT FOP for AASHTO T 335.

The minimum void ratio of the aggregate shall be 30 percent as determined by AASHTO T 19.

Permeable ballast material may be conditionally approved based on Contractor submitted sampled materials prior to delivery to the site. Final Acceptance will be based on conformance testing completed on material that has been delivered, installed, and compacted on site. The exact point of acceptance will be determined by the Engineer. Material out of conformance with the project specifications will be removed and replaced at the Contractor's expense.

**4-04.2 Gravel Base**  
(March 9, 2016 APWA GSP)

Supplement section 9-03.9(2) with the following:

***Crushed Surfacing Choker Course***

Crushed Surfacing Choker Course shall be manufactured from ledge rock, talus, or gravel in accordance with the provisions of Section 3-01. Recycled concrete is not permitted. The materials shall be uniform in quality and substantially free from wood, roots, bark, and other extraneous material and shall meet the following quality test requirements:

Los Angeles Wear, 500 Rev	30% maximum
Degradation Factor	30 minimum
Minimum Void Content:	30% as determined by AASHTO T19 or ASTM C29, rodding procedure.

The grading and quality requirements are:

Sieve Size	Percent Passing
1-1/2 inch	100
1 inch	95-100
1/2 inch	25-60
#4	0-10
#8	0-5
% Fracture	95

All percentages are by weight.

The fracture requirement shall be at least two (2) fractured faces and will apply to the combined aggregate retained on the No. 4 sieve in accordance with WSDOT FOP for AASHTO T 335.

#### **4-04.2 Gravel Base**

*(March 9, 2016 APWA GSP)*

Supplement section 9-03.9(2) with the following:

Aggregates for permeable base shall meet the requirements for grading and quality when placed in hauling vehicles for delivery to the site, after placement in temporary stockpiles on site, during installation, and after installation and compaction.

Acceptance of aggregates shall be as provided under non-statistical evaluation.

The Contractor's submittal for the aggregate material shall provide description of sampling methodology, identify where and how the sample was collected, total weight of sample collected, description of sample preparation procedures, total weight of sample sieved to determine grain size distribution, and test results. Sampling and preparation shall be in conformance with ASTM D75 and ASTM C702.

**4-04.3(5) Shaping and Compaction**  
(March 9, 2016 APWA GSP)

Supplement this section with the following:

Immediately following spreading and final shaping each layer of surfacing shall be lightly compacted in one lift until no visible movement of aggregate is observed resulting in a firm and unyielding condition, as determined by the Engineer.



**4-04.4 Measurement**  
(March 9, 2016 APWA GSP)

Supplement this section with the following:

Crushed Surfacing Choker Course will be measured by the ton in accordance with Section 1-09.2, based on certified truck tickets collected by the Contractor and provided to the inspector at the end of each working day.

**4-04.5      Payment**

*(March 9, 2016 APWA GSP)*

Supplement this section with the following:

“Crushed Surfacing Choker Course”, per ton.

Supplement Division 4 with the following:  
(March 9, 2016 APWA GSP)

## **ASPHALT TREATED PERMEABLE BASE (ATPB)**

### **Description**

Asphalt treated permeable base (ATPB) consists of a compacted course of base material which has been weatherproofed and stabilized by treatment with an asphalt binder.

This work consists of constructing one or more courses of asphalt treated permeable base (ATPB) upon a prepared foundation or base in accordance with these Specifications and in conformity with the lines, grades, thicknesses, and typical cross-sections shown in the Plans or as established by the Engineer.

### **Materials**

Materials shall meet the requirements of the following sections:

Asphalt 9-02.1  
Anti-Stripping Additive 9-02.4

### **Aggregates for Asphalt Treated Permeable Base (ATPB)**

#### **General Requirements**

Aggregates for asphalt treated permeable base shall be manufactured from ledge rock, talus, or gravel, in accordance with the provisions of Section 3-01 that meet the following test requirements:

Los Angeles Wear, 500 Rev. 30% maximum  
Degradation Factor 15 minimum

### **Grading**

Aggregates for asphalt treated permeable base (ATPB) shall meet the following requirements for grading:

Sieve Size	Percent Passing *
¾" square	100
½" square	90 - 100
3/8" square	40 - 80
U.S. No. 4	0 - 30
U.S. No. 8	0 - 20
U.S No. 16	0 - 10

\* All percentages are by weight.

The aggregate shall consist of a combination of crushed and natural aggregates with a percent fracture greater than 75% on one face on the No. 4 sieve and above, in accordance with the field operating procedures for AASHTO T 335.

### **Test Requirements**

When the aggregates are combined within the limits set forth in Section 9-03.6(2) and mixed in the laboratory with the designated grade of asphalt, the mixture shall meet the following test values:

% of Theoretical Maximum  
Specific Gravity (Gmm)

70 @ 75 gyrations (approximate  
= 30% void space)

AASHTO T324, WSDOT TM T718 or  
ASTM D3625

Pass (Acceptable anti-strip  
evaluation tests)

The sand equivalent value of the mineral aggregate for asphalt treated permeable base (ATPB) shall not be less than 35.

### **Paving Asphalt**

The grade of paving asphalt binder shall be PG70-22ER unless otherwise specified by the Contract.

The manufacture of ATPB may include warm mix asphalt (WMA) processes in accordance with these Specifications. WMA processes include organic additives, chemical additives, and foaming that allow for lower mixing and placement temperatures without impacting the final ATPB pavement properties.

## **Construction Requirements**

### **Asphalt Mixing Plant**

Asphalt mixing plants for ATPB shall meet the following requirements:

#### **Heating**

The plant shall be capable of heating the aggregates to the required temperature.

#### **Proportioning**

The mixing plant shall be capable of proportioning: the aggregates to meet the Specifications, and the asphalt binder at the rate specified in the approved job mix formula (JMF). If the aggregates are supplied in two or more sizes, means shall be provided for proportioning or blending the different sizes of aggregates to produce material meeting the Specification requirements

#### **Mixing**

The mixer shall be capable of producing a uniform mixture of uniformly coated aggregates meeting the requirements of these Specifications.

### **Preparation of Aggregates**

Aggregates for ATPB shall be stockpiled before use in accordance with the requirements of Section 3-02. The aggregates shall be heated in the Asphalt Mixing

Plant in compliance with the JMF and related temperature viscosity curves for the asphalt binder grade specified.

### **Mix Design**

The asphalt binder for ATPB shall be PG 70-22ER polymer modified or higher grade unless otherwise stated. Binder content shall be between 3.0% and 4.5% by total weight of the mix, and will be the highest percentage that passes void requirements test at  $N_{design} = 75$  gyrations. The binder content tolerance shall be  $\pm 0.3\%$  during production/ placement of the ATPB. The Contractor shall adjust the aggregate to meet the targeted void space specification.

Target void space shall be approximately 30% per ASTM D3203.

The Contractor shall include a mix design submittal documenting the ATPB mix design test results presented alongside the mix design specification criteria included in this Specification, along with the submittal temperature-viscosity curves from the polymer-modified asphalt binder supplier showing the recommended mixing and compaction temperatures developed for dense graded HMA applications.

The Contractor shall determine anti-strip requirements for ATPB and provide data for anti-strip dosage as part of the mix design approval process. The ATPB mix shall be tested for its resistance to stripping by water in accordance with ASTM D-3625. If the estimated coating area is not above 95 percent, a Qualified Products List (QPL) anti-stripping agent shall be added to the ATPB to a level that achieves 95 percent plus asphalt binder retention using ASTM D-3625. The Contractor shall be responsible for conducting the anti-stripping evaluation and providing a report to the Engineer. A documented anti-strip evaluation (either AASHTO T324 or WSDOT TM T718) of an existing dense graded hot mix asphalt (HMA) from the same aggregate source and binder supplier as the proposed ATPB may be used to document acceptable anti-strip dosage rates in lieu of ASTM D-3625 testing.

### **Mixing**

The asphalt treated permeable base shall be mixed in accordance with the requirements of Section 5-04.3(8).

### **Hauling Equipment**

Hauling equipment for asphalt treated permeable base shall conform to the requirements of Section 5-04.3(2).

### **Spreading and Finishing**

Asphalt treated permeable base shall be spread with a spreading machine equipped with a stationary, vibratory, or oscillating screed or cut-off device, subject to the approval of the Engineer. Approval of the equipment shall be based on a test section demonstrating that the finished product will meet all requirements of the Specifications. Automatic controls will not be required.

The internal temperature of the ATPB mixture at the time final rolling and targeted consolidation is achieved shall be a minimum of 185°F. Rollers shall only be operated in the static mode when the internal temperature of the ATPB is less than 175°F.

Unless otherwise directed by the Engineer the nominal compacted depth for any layer of asphalt treated permeable base shall not exceed 0.40 feet. A light tack coat (approximately 0.02 gallons/square yard residual asphalt) shall be applied between lifts of ATPB. A tack coat shall also be applied between the ATPB surface and the subsequent paving lifts when cleaning of the ATPB surface is necessary.

Tack coat shall be uniformly applied to cover the existing porous pavement with a thin film of residual asphalt free of streaks and bare spots. A heavy application of tack coat shall be applied to all joints. The spreading equipment shall be equipped with a thermometer to indicate the temperature of the tack coat material.

Equipment shall not operate on tacked surfaces until the tack has broken and cured. If the Contractor's operation damages the tack coat it shall be repaired prior to placement of the PHMA.

Unless otherwise approved by the Engineer, the tack coat shall be CSS-1 or CSS-1h emulsified asphalt. The CSS-1 and CSS-1h emulsified asphalt may be diluted with water at a rate not to exceed one part water to one part emulsified asphalt. The tack coat shall not exceed the maximum temperature recommended by the emulsified asphalt manufacturer.

#### **Subgrade Protection Course**

Unless otherwise specified by the Engineer, the Contractor shall place the asphalt treated permeable base as a protection for the prepared foundation or base on all sections of individual Roadways which are to receive ATPB as soon as 10,000 square yards of prepared foundation or base is completed. This requirement shall not be limited to contiguous areas on the project.

The surface of the prepared foundation or base protection layer when constructed on a grading project shall conform to grade and smoothness requirements that apply to the prepared foundation or base upon which it is placed.

#### **Finish Course**

The final surface course of the ATPB, excluding shoulders, shall not deviate at any point more than  $\frac{3}{8}$  inch from the bottom of a 10-foot straightedge laid in any direction on the surface on either side of the Roadway crown. Failure to meet this requirement shall necessitate sufficient surface correction to achieve the required tolerance, as approved by the Engineer, at no expense to the Contracting Agency.

When portland cement concrete pavement is placed on an asphalt base, the surface tolerance of the asphalt base shall be such that no elevation lies more than 0.05 feet below nor 0.00 feet above the plan grade minus the specified plan depth of portland cement concrete pavement. Prior to placing the portland cement concrete pavement, any such irregularities shall be brought to the required tolerance by grinding or other means approved by the Engineer, at no expense to the Contracting Agency.

#### **Density & Infiltration Testing for Acceptance**

The asphalt treated permeable base shall be consolidated to a firm and unyielding state. The Contractor will develop a roller pattern that will initially consolidate the pavement structure and then use static rolling only thereafter. Density testing targeting 15 to 20% final air voids (80% to 85% of maximum theoretical (Rice)

density) in the ATPB will be performed by the Contractor to monitor the consolidation effort and to avoid over compaction. The frequency of these tests shall be at the discretion of the Engineer. The use of equipment which results in damage to the materials, over consolidates the ATPB or produces substandard workmanship will not be permitted.

Pneumatic tire rollers shall not be used.

The Contractor shall conduct infiltration tests on the finished ATPB per ASTM C1701 at locations chosen by the Engineer. Newly-placed ATPB shall have a minimum infiltration rate of 150 inches/hour. Infiltration tests shall be completed every 150 linear feet of roadway and conducted in accordance with ASTM C1701. Target density may be adjusted and used for acceptance, at the discretion of the Engineer, if the ATPB is consistently meeting the 150 inches/hour acceptance standard.

If the measured infiltration rate is less than 150 inches/hour, the Contractor shall conduct four additional tests as follows in line with the paver direction of travel. Two tests upstream and two tests downstream of the initial test location shall be taken at distances of 20 feet and 40 feet. Results of the additional tests will be averaged. The Contractor shall conduct additional testing upstream and downstream to identify areas to be removed. If the average infiltration rate is less than required the Contractor shall remove and replace the failing ATPB areas at the direction of the Engineer and at no cost to the Contracting Agency.

#### **Measurement**

ATPB will be measured by the ton in accordance with Section 1-09.2, based on certified truck tickets collected on the day of placement. No deductions will be made for the weight of asphalt binder, anti-stripping additive, tack coating between lifts or any other component of the mixture.

#### **Payment**

Payment will be made for the following Bid item:

“Asphalt Treated Permeable Base, PG \_\_\_\_ ER”, per ton.

The unit contract price per ton for “Asphalt Treated Permeable Base, PG \_\_\_\_ ER” shall be full pay for all labor, equipment, and materials required to construct the ATPB including joints, where required, haul, compaction, tack coat, anti-stripping additive, if required, and Contractor testing as specified.

**5-04.1 Description**

*(March 9, 2016 APWA GSP)*

Supplement this section with the following:

This Work shall also consist of providing and placing one or more layers of plant-mixed porous hot mix asphalt (PHMA) on a prepared foundation or base in accordance with these Specifications and the lines, grades, thicknesses, and typical cross-sections shown in the Plans or established by the Engineer. The manufacture of PHMA may include porous warm mix asphalt (PWMA) processes in accordance with these Specifications. PWMA processes include organic additives, chemical additives, and foaming.



#### **5-04.2 Materials**

(March 9, 2016 APWA GSP)

Supplement section 9-03.8 with the following:

#### **Aggregates for Porous Hot Mix Asphalt/Porous Warm Mix Asphalt (PHMA/PWMA)**

##### **General Requirements**

Aggregates for Porous Hot Mix Asphalt (PHMA) or Porous Warm Mix Asphalt (PWMA) shall be manufactured from ledge rock, talus, or gravel, in accordance with the provisions of Section 3-01 that meet the following test requirements:

Los Angeles Wear, 500 Rev.	30% max.
Degradation Factor	15 min.

##### **Grading**

Aggregates for PHMA/PWMA shall meet the following requirements for grading:

Sieve Size	Percent Passing
¾" square	100
½" square	90 - 100
⅜" square	55 - 90
U.S. No. 4	10 - 40
U.S. No. 8	0 - 20
U.S. No. 40	0 - 13
U.S. No. 200	0 - 5

\* All percentages are by weight.

The aggregate for PHMA/PWMA shall consist of crushed stone with a percent fracture greater than 90% on two faces on the No. 4 sieve and above, and shall be tested in accordance with the field operating procedures for AASHTO T 335.

### **5-04.3 Construction Requirements**

*(March 9, 2016 APWA GSP)*

Supplement this section with the following:

#### **Porous Asphalt (PHMA/PWMA) Acceptance Infiltration Test**

Contractor shall conduct infiltration tests on the finished PHMA/PWMA per ASTM C1701 at locations chosen by the Engineer. Newly-placed PHMA/PHWA shall have a minimum infiltration rate of 100 inches/hour. Infiltration tests shall be completed every 150 linear feet of roadway and conducted in accordance with ASTM C1701.

If the measured infiltration rate is less than 100 inches/hour, the Contractor shall conduct an additional four infiltration tests in line with the paver direction of travel. Two tests upstream and two tests downstream of the initial test locations shall be taken at distances of 20 feet and 40 feet. Results of the additional tests will be averaged. The Contractor shall conduct additional testing upstream and downstream to identify area to be removed. If the average infiltration rate is less than required remove and replace the failing section at the direction of the Engineer and at no cost to the Contracting Agency.

**5-04.3(1) Hot Asphalt Mixing Plant**  
(March 9, 2016 APWA GSP)

Supplement this section with the following:

Plants used for preparation of PHMA shall conform to the following requirements:

**Fiber Supply System**

When fiber stabilizing additives are determined necessary to achieve drain down criteria per APWA GSP 5-04.3(7)A of these Specifications, a separate feed system that meets the following shall be required:

1. Accurately proportions by weight the required quantity into the mixture in such a manner that uniform distribution will be obtained.
2. The fibers shall be uniformly distributed prior to the injection of the asphalt binder into the mixture. When a continuous or drier-drum type plant is used, the fiber shall be added to the aggregate and uniformly dispersed prior to the injection of asphalt binder.

**Surge and Storage Systems**

The storage time for PHMA/PWMA mixtures shall be no more than four (4) hours for non-insulated silos or eight (8) hours for insulated silos. Placement temperature specifications shall be met regardless of silo storage time.

**5-04.3(7)A Mix Design**  
(March 9, 2016 APWA GSP)

Supplement this section with the following:

Mix Designs for PHMA shall be submitted to the Engineer on Washington State DOT Form 350-042 with the additional PHMA test data required by this specification provided as a one page supplemental attachment. The supplemental test data form is available at <http://www.wsdot.wa.gov/partners/apwa/PorousAsphaltPavement.pdf>.

The asphalt binder for PHMA/PWMA shall be PG 70-22ER polymer modified or higher grade. Binder content shall be between 6.0% and 7.0% by total weight of the mix, and will be the highest percentage that passes both the drain down and void requirements tests at  $N_{\text{design}} = 75$  gyrations. The binder content tolerance shall be  $\pm 0.3\%$  during production/ placement of the PHMA/PWMA. The Contractor shall adjust the aggregate to meet the maximum drain down test requirements within the ranges provided below.

1. Drain down shall be 0.3 %, maximum, according to ASTM D6390
2. Void ratio shall be 16% to 25% per ASTM D3203 at  $N_{\text{design}} = 75$  gyrations.

The Contractor shall include with the submittal temperature-viscosity curves from the polymer-modified asphalt binder supplier showing the recommended mixing and compaction temperatures developed for dense graded HMA applications.

The Contractor shall determine anti-strip requirements for PHMA/PWMA and provide data for anti-stripping. The asphaltic mix shall be tested for its resistance to stripping by water in accordance with ASTM D-3625. If the estimated coating area is not above 95 percent, anti-stripping agents shall be added to the asphalt. Contractor shall be responsible for conducting the anti-stripping evaluation and providing a report to the Engineer.

Alternately, anti-strip evaluation of an existing dense graded hot mix asphalt of the same maximum nominal aggregate class and from the same aggregate materials source may be used to set the anti-stripping requirements for PHMA/PWMA. The anti-strip requirement for the PHMA/PWMA shall be equivalent to the anti-stripping requirement for the HMA.

**5-04.3(8)A1 General**

*(March 9, 2016 APWA GSP)*

Supplement this section with the following:

Commercial evaluation will be the basis for acceptance of PHMA/ PWMA.

**5-04.3(8)A6 Test Methods**  
(March 9, 2016 APWA GSP)

Supplement this section with the following:

The temperature of the mix at the time of discharge from the haul vehicle shall be within the temperature range identified in the approved PHMA submittal.

**5-04.3(9) Spreading and Finishing**  
(March 9, 2016 APWA GSP)

Supplement this section with the following:

Placement temperature of the mixture shall be within the temperature range identified in the approved PHMA/PWMA submittal.

**5-04.3(10)A General**

*(March 9, 2016 APWA GSP)*

Supplement this section with the following:

Pneumatic tire rollers shall not be used for compaction of PHMA/PWMA.

The Contractor shall develop a roller pattern that will initially consolidate the pavement structure as well as target 15% to 18% final air voids (82% to 85% of maximum theoretical (Rice) density). The Contractor shall monitor compaction during placement of PHMA/PWMA with a pavement density gauge.



**5-04.4 Measurement**  
(March 9, 2016 APWA GSP)

Supplement this section with the following:

PHMA/PWMA will be measured by the ton in accordance with Section 1-09.2, with no deduction being made for the weight of asphalt binder, blending sand, mineral filler, or any other component of the HMA. If the Contractor elects to remove and replace mix as allowed in Section 5-04.3(11), the material removed will not be measured.

**5-04.5 Payment**

*(March 9, 2016 APWA GSP)*

Supplement this section with the following:

“PHMA CL. 1/2” In. PG 70-22ER”, per ton.

The unit Contract price per ton for “PHMA CL. 1/2 In. PG 70-22ER” shall be full compensation for all costs, including anti-stripping additive and tack coat, incurred to carry out requirements of Section 5-04 except for those costs included in other items which are included in this Subsection and which are included in the Proposal.

Supplement Division 5 with the following:  
(March 9, 2016 APWA GSP)

## **5-06 PERVIOUS CONCRETE PAVEMENT**

### **5-06.1 Description**

This work shall consist of constructing a pervious cementitious pavement composed of portland cement concrete on a prepared subgrade or subbase in accordance with these Specifications and in conformity with the lines grades, thicknesses, and typical cross-sections shown in the Plans or established by the Engineer.

### **5-06.2 Materials**

Materials shall meet the requirements of the following sections:

Portland Cement	9-01
Aggregates for Portland Cement Concrete	9-03.1
Premolded Joint Filler for Expansion Joints	9-04.1(2)
Curing Materials and Admixtures	9-23
Water	9-25

Hydration stabilizing admixtures shall conform to the requirements of Section 9-23.6(3) or 9-23.6(5).

### **Synthetic Fibers for Concrete**

When specified synthetic fibers to be included in the mix for portland cement concrete shall conform to the requirements of ASTM D 7508/7508M.

### **5-06.3 Construction Requirements**

#### **5-06.3(1) Pervious Concrete Preconstruction Meeting**

Prior to the start of construction of the pervious concrete pavement section, including excavation of the pavement section, the Contractor shall coordinate, schedule and attend a preconstruction meeting for the pervious concrete pavement. The following are required to attend the meeting:

1. Contracting Agency representative.
2. General Contractor's representative(s).
3. Engineer of Record for the pervious concrete pavement.
4. Concrete placement lead person(s).
5. Associated Subcontractor's representative.
6. Pervious concrete Supplier's representative.
7. Material Testing Laboratory's representative.

The meeting shall cover all aspects of the work including, but not limited to:

1. Submittals.
2. Short and long term schedule.
3. Inspection of the Work.
4. Protection of the Work.
5. Pervious concrete placement.
6. Curing.

7. Materials.
8. Specifications.
9. Testing.
10. Test panel and JMF.
11. Acceptance criteria.

#### **5-06.3(2) Pervious Concrete Mix Design**

The Contractor shall provide a mix design for pervious concrete and shall submit the mix design to the Engineer in writing. Pervious concrete shall not be placed in the test panels without a mix design that has been reviewed and accepted by the Engineer.

#### **5-06.3(2)A Mix Design Criteria**

The Contractor shall include the following elements and results of the described procedures in the proposed mix design:

1. A unique identification number for the mix design that is approved for the Job Mix Formula (JMF).
2. Portland cement shall be Type I, Type II, Type I-II Type IP, or Type IS.
3. The cementitious content, including pozzolans if used, shall be a minimum of 480 pounds per cubic yard.
4. The mix shall incorporate a hydration stabilizing admixture.
5. Synthetic microfibers may be utilized at the manufacturer's recommended dosage rate.
6. The water / cement ratio shall not exceed 0.35.
7. No more than 25 percent of portland cement in the mix, by weight, may be replaced by fly ash, ground granulated blast furnace slag, or a combination of both.
8. Coarse aggregate shall conform to Section 9-03.1(4), AASHTO Grading No.8.

#### **5-06.3(2)B Job Mix Formula (JMF)**

The approved mix design established through the approved test panel becomes the JMF.

#### **5-06.3(3) Submittals**

In accordance to Section 1-05.3, the Contractor shall submit the following items to the Engineer for acceptance prior to placing any pervious concrete pavement:

1. The source of all materials proposed for use in constructing pervious concrete pavement.
2. Batch weights for all constituents of one (1) cubic yard of the proposed pervious concrete mix.
3. The specific gravity (SSD) of all aggregates to be used in the proposed pervious concrete mix.
4. The proposed gradation of coarse aggregates used in pervious concrete.
5. The designed volume in cubic feet of all proposed components for 1(one) cubic yard of the proposed pervious concrete mix.
6. The design water / cement ratio of the proposed mix design.
7. The fresh density of the proposed pervious concrete mixture as determined by ASTM C1688.
8. Catalogue cuts and Certificates of Compliance for all proposed admixtures.

9. Mill Certification of the portland cement and pozzolans, if used, for the current lot to be used in the production of the proposed pervious concrete mix. The Contractor shall maintain this submittal throughout the duration of the project as lots change.
10. Current certification by the National Ready Mix Concrete Association (NRMCA) for the batch plant(s) to be used in the production of pervious concrete.
11. Current certifications by the NRMCA for the trucks to be used in transporting pervious concrete from the batch plant to the point of placement.
12. Qualification documentation for current certifications by the NRMCA for the Contractor's personnel who will be installing pervious concrete. See Section 5-06.3(10)A. Valid acceptable documentation is the NRMCA issued wallet card or certification certificate.
13. At the time of delivery of the material to the site, the Contractor shall provide an original Certificate of Compliance for each truckload of pervious concrete. The Certificate of Compliance shall include information noted in Section 6-02.3(5)B. If the Certificate of Compliance from the concrete producer is not provided to the Engineer upon delivery, the truckload shall not be placed.

#### **5-06.3(4) Equipment**

Equipment necessary for handling materials, mixing, delivering, and performing all parts of the Work, shall be in good repair, designed for the task, and operated by trained and qualified personnel.

#### **5-06.3(4)A Batching Plant and Equipment**

Pervious concrete shall be centrally mixed in a plant with a current NRMCA certification.

#### **5-06.3(4)B Mixer Trucks**

Pervious concrete shall be transported to the location by truck mixers, non-agitating trucks shall not be used for the transport of pervious concrete. The drums on mixer trucks used to transport pervious concrete shall have fins that are not excessively worn, damaged or have excessive concrete buildup. Mixer trucks shall have a current NRMCA certification.

#### **5-06.3(4)C Side Forms**

Pervious concrete shall be placed in stationary forms. If pervious concrete is to be placed against a curb, previously placed concrete, or other existing structure, they may be used as a side form for the pervious concrete paving. Forms for pervious concrete shall be made of steel or wood and shall be in good condition, and shall be capable of being anchored in place so that they will be true to grade, line and slope. Forms shall be sufficiently rigid to maintain specified tolerances and capable of supporting concrete and mechanical concrete placing equipment. Forms shall be in good condition, straight, clean, free of debris, non-adherent rust and hardened concrete.

Set, align, and brace forms so that they hardened pavement meets the lines, grades and slopes as shown in the drawings. Apply form-release agent to the form face, which will be in contact with concrete, immediately before placing concrete. Form release agent shall not be applied to previously placed concrete. Previously placed pavement shall be protected from damage.

The Contractor shall inspect all forms for line, grade and slope. No pervious concrete shall be placed until the forms have been inspected by the Engineer.

#### **5-06.3(4)D Finishing Equipment**

Finishing equipment for pervious concrete paving shall be designed for the intended work, shall be clean and in good operating condition.

Equipment used for striking off the pervious concrete shall leave a smooth surface at the planned grades and shall not cause excess paste to be left on, or drawn to, the surface. If rollers or spinning screeds are used to compact, they shall be of sufficient weight and width to compact the pervious concrete uniformly through its depth and to grade without marring the surface. Equipment used for compacting pervious concrete shall not cause the surface to close or otherwise clog and shall produce a surface that is free of ridges or other imperfections. Tools used for producing joints shall be designed and manufactured for the purpose and shall not otherwise damage or mar the surface.

Vibrating equipment shall not be used for placement or compaction of pervious concrete.

#### **5-06.3(5) Measuring and Batching Materials**

Measuring and batching materials for pervious concrete pavement shall conform to the requirements of Section 5-05.3(4).

#### **5-06.3(6) Acceptance**

For acceptance, pervious concrete pavement will be divided into lots as follows: A single lot (lot) is represented by the lesser of: one (1) day's production or 360 square yards of pervious concrete in place. Where the Contractor has more than one crew placing pervious concrete, lots will be associated with each crew. Representative lot size will be determined to the nearest square yard. If no sample is taken on a Day, that Day's quantities may be included in the next or previous Day's lot(s). The Engineer may isolate an area of pervious concrete within a lot that is deemed to be defective in any way and such an area will be considered to be a new lot for purposes of acceptance. New lots determined in this manner shall be extended as necessary such that they are bounded by planned joints. Acceptance of a lot of pervious concrete pavement will be based on the following criteria:

1. **Grade:** Conform to the dimensions, lines, slopes and grades specified on the plans. Pervious concrete pavement shall be true to planned grades and shall not deviate from grade more than  $\frac{1}{4}$  inch in ten (10) feet. Where abutting existing facilities such as sidewalks, walkways, curbs, driveways or other pavements, the pervious concrete shall be flush.
2. **Conformance to JMF:** The pervious concrete pavement used shall conform to the mix design for the JMF within the limits as set forth in Section 6-02.3(5)C and as determined from the accepted test panel.
3. **Compacted Thickness and Average Hardened Density:** After a minimum of seven (7) calendar days of curing, remove and measure three (3) cores from each lot. Remove cores in accordance with ASTM C42/C42M. Measure the length of each core in accordance with ASTM C1542/1542M. No single core shall be less than  $\frac{3}{4}$  inch of the design depth on the drawings. The average of all cores from a lot shall be within minus  $\frac{3}{8}$  inch of the design depth on the plans.

After length is measured, measure hardened density of each core in the lot in accordance with ASTM C1754/C1754M. The hardened density from a lot must be within +/- 5 percent of the average hardened density of the JMF (approved test panel).

4. **Infiltration Rate:** The infiltration rate at any single test point shall not be less than 100 inches per hour.
5. **Fresh Density:** The fresh density of each lot will be measured by ASTM C1688 at the point of placement shall be within +/- five (5) pounds per cubic foot of the fresh density determined from the JMF (approved test panel).
6. **Appearance:** The appearance of each lot shall be consistent with the JMF (approved test panel). The pervious concrete pavement shall have a consistent surface texture, shall not be raveled, shall be free of ridges or other surface imperfections, shall have joints that are in the specified location and are constructed per specification, and shall be free of cracks.

Testing for acceptance will be performed by the Engineer.

#### **5-06.3(6)A Infiltration Rate of the Placed Pavement**

The infiltration rate of the pervious concrete shall be determined at four (4) random locations within each lot. The locations for conducting infiltration tests will be determined by the Engineer. The Contractor shall coordinate and schedule testing with the Engineer a minimum of five (5) Working Days in advance. The infiltration rate on the finished surface will be determined in accordance with ASTM C1701, except the infiltration ring diameter may be 12-inches to 24-inches in diameter. The infiltration test will be conducted after a minimum of seven (7) calendar days of curing has occurred.

If the measured infiltration rate is less than 100 inches/hour at any test location, the Contractor may request in writing that the Engineer perform additional infiltration tests for the purpose of assessing overall infiltration performance and/or determining a defective lot in accordance with Section 5-06.3(6). The determination of a defective lot, or lots, and the extent(s), will be by the Engineer. The cost of additional testing shall borne by the Contractor at a rate of (\$\$1\$\$) per test.

#### **5-06.3(7) Rejection**

Pervious concrete may be rejected by the Contractor for any reason.

A truckload of pervious concrete will be rejected if the Certificate of Compliance is not provided at the time of delivery of the material to the site. See Section 5-06.3(4)B.

Pervious concrete that is improperly cured or is allowed to freeze during the initial seven (7) day curing period will be rejected.

Pervious concrete pavement that does not meet the acceptance criteria put forth in Section 5-06.3(6) will be rejected by the Engineer on a lot by lot basis.

During the removal process of the rejected pavement, The Contractor shall implement measures to protect the adjacent pervious concrete pavement to remain. If pervious concrete pavement becomes damaged by the Contractor during removal

of the rejected pavement then additional pavement areas may be rejected by the Engineer to the next planned joint.

Fresh pervious concrete that has been rejected by the Engineer, or the Contractor, shall not be placed, or shall be removed and replaced, at no additional cost.

#### **5-06.3(8) Mixing Pervious Concrete**

Batch, mix and deliver pervious concrete in compliance with ASTM C94/C94M except that pervious concrete shall not be transit mixed or shrink mixed. If water is added to the mix after it is delivered on site, the fresh density for the pervious concrete shall meet the requirements of the approved JMF referenced in this section.

#### **5-06.3(8)A Limitations of Mixing Pervious Concrete**

Mixing and placing concrete shall be discontinued when a descending air temperature in the shade away from artificial heat reaches 40° F and shall not be resumed until an ascending air temperature in the shade and away from artificial heat reaches 40° F.

The temperature of fresh pervious concrete shall not be less than 55° F, nor more than 90° F when placed.

Pervious concrete shall not be mixed with aggregates at less than 32° F.

#### **5-06.3(9) Subgrade Preparation and Subbase**

Prepare and protect subgrade in accordance with Section 2-06.

Prepare and protect subbase in accordance with Section 4-04.

#### **5-06.3(10) Placing, Spreading, Finishing, Edging, Tolerances and Curing**

Pervious concrete shall not be placed, compacted or finished when the natural light is inadequate, unless an adequate lighting system is in operation. The adequacy of light will be determined by the Engineer.

Wet the surface of the subbase with water immediately before placing pervious concrete. Deposit concrete either directly from the transporting equipment or by conveyor on the subbase, unless otherwise specified. Pervious concrete shall not be placed on frozen subbase. Deposit concrete between the forms to an approximately uniform height. Spread the concrete using mechanized equipment or hand tools. Vibrating equipment shall not be used for spreading pervious concrete.

Strike off concrete between forms using a form-riding paving machine, roller screed, or spinning screed.

Compact concrete to a uniformly dense structure without clogging the surface with paste.

Finish the pervious concrete to a uniform, open-textured surface to match the appearance of the approved JMF test panel.

Edges shall be hand tooled to a radius of ¼ inch.



Curing materials for pervious concrete shall be in place no more than 20 minutes of discharge onto the subbase. The pavement surface and all exposed edges shall be completely covered with sheet curing materials conforming to Section 9-23.1. The curing material shall be secured at all exterior edges and interior laps without damaging the pervious concrete. The method of securing the curing material shall prevent wind from removing the sheet and from blowing under the sheet across the surface of the concrete. Cure the pavement for a minimum of seven (7) uninterrupted days.

All traffic (foot and vehicular), staging, stockpiling or other work shall be kept off of the pervious concrete pavement during the curing period. Any testing for acceptance shall not occur until the end of the curing period.

Protect concrete from freezing and cold weather in accordance with 5-06.3(12).

#### **5-06.3(10)A Contractor's Qualifications**

The contractor shall employ no less than one (1) National Ready Mixed Concrete Association (NRMCA) certified Pervious Concrete Craftsman for each crew, who must be on site, over-seeing the work during all pervious concrete placement; or employ no less than three (3) NRMCA Certified Pervious Concrete Installers per crew, who must be on site working during each pervious concrete placement. The minimum number of certified individuals must be present on each crew for every pervious concrete placement, including the test panel placements, and a certified individual must be in charge of the placement crew and procedures.

If, in the opinion of the Engineer, personnel used for installing pervious concrete are unqualified, inattentive to quality, or unsafe, they shall be removed or reassigned from installation of pervious concrete at the written request of the Engineer.

#### **5-06.3(10)B Test Panel**

Production placement of pervious concrete shall not occur until the Contractor has completed a test panel of pervious concrete pavement that meets all of the acceptance criteria described herein and is accepted by the Engineer.

The Contractor shall construct a test panel utilizing a minimum of seven (7) cubic yards of pervious concrete. If multiple pavement section depths are shown on the plans, a test panel shall be constructed for each pavement section depth/thickness. The width of the test panel shall have a width no smaller than the greatest width to be used during the construction and installation of the pervious concrete onsite. The test panel(s) shall include at least one joint and at the spacing specified on the plans and specifications. Test panels may be placed non-contiguously. The test panel(s) shall be equivalent and representative of the production pervious concrete pavement in all aspects including subbase, depth, joints, method of placement, curing, and preparation. Construction and evaluation of the test panel shall occur as follows:

1. Notify the Engineer at least ten (10) Working Days before installing pervious concrete test panels.
2. Coordinate the location of the test panel with the Engineer.
3. Install the test panel in accordance with the Specifications and Drawings.
4. Notify the Engineer when the test panel is ready for inspection and acceptance testing.
5. Acceptance testing will be conducted in accordance with Section 5-03.3(6).

6. Remove, replace, and dispose of any unsatisfactory portions of test panels as determined by the Engineer, at no additional cost to the Contracting Agency. Failure to install acceptable test panel(s) of pervious concrete will indicate an unapproved test panel(s) and require new test panel(s) for review.

The completed and approved test panel(s) shall establish the JMF.

The approved test panel shall meet the requirements of Section 5-03.3(6).

Upon successful completion of the infiltration test, unless otherwise determined by the Engineer, three (3), cores will be cut in accordance with ASTM C42 and will be used to validate the mix design under the acceptance criteria of Section 5-06.3(6). Cores shall be taken at the same location where the infiltration test was conducted. The average hardened density of the cores shall be the hardened density used for the JMF. The hardened density of each core used for determining the JMF shall be within five (5) percent of the mean value of the three cores. Core holes shall be filled by the Contractor with pervious concrete meeting the proposed JMF and shall match adjacent pavement color, texture and grade.

The completed and accepted test panels shall be maintained and protected throughout the duration of the Work and may not be demolished and disposed of without written permission from the Engineer. If the test panel(s) is incorporated into the Work, it shall remain in place accepted as a single lot.

#### **5-06.3(11) Joints**

Construct joints at the locations, depths and with horizontal dimensions indicated on plans unless noted otherwise in this section. Joints shall be of three (3) types: construction, contraction, isolation. Construction joints shall be formed at the end of a day's work or when necessary to stop production for any reason. Contraction joints shall be used to control random cracking. Isolation joints shall be used where the pervious concrete abuts existing facilities or where shown on the Plans.

#### **5-06.3(11)A Construction Joints**

Construction joints shall be located at the location of a planned contraction or isolation joint. Construction joints are to be formed by placing a header between the forms, at right angles, to the full depth of the finished pervious concrete, and set to the height of the forms. Pervious concrete shall be placed against the header and compacted and finished as normal, including edging. The header shall remain in place until paving resumes.

#### **5-06.3(11)B Contraction Joints**

Contraction joints (transverse and longitudinal) shall be constructed at the locations and intervals shown in the Contract. Contraction joints shall be a depth of 1/3 the thickness of the pervious concrete pavement section and have a width of no more than 1/4 inch. Contraction joints shall not be saw cut unless specifically noted on the Plans. Saw cut joints shall have a minimum width of 1/8 inch. Plastic formed contraction joints shall be tooled on both sides of the joint with a radius of 1/2 inch. Tool joint to the depth and width in fresh concrete immediately after the concrete is compacted.

**5-06.3(11)C Isolation Joints**

Isolation joints shall be placed where the pervious concrete abuts existing structures or where shown on the Plans. Isolation joints shall continue through the depth of the pervious concrete using a 3/8 inch premolded joint filler meeting the requirements of Section 9-04.1(2). Isolation joints may be formed by forming a construction joint and affixing the premolded joint filler against one side of the joint and placing fresh pervious concrete against it. Isolation joints and filler shall be flush with the surrounding pervious concrete and shall not deviate from the acceptance criteria for smoothness as shown in Section 5-06.3(6). The edge of the pervious concrete adjacent the premolded joint filler shall be hand tooled with a 1/2 inch radius.

**5-06.3(12) Cold Weather Work**

When concrete is being placed and the ambient air temperature is expected to drop below 35° F during the day or night, the Contractor shall protect the concrete from freezing. The Contractor shall submit for approval a Cold Weather Plan prior to placing concrete when ambient air temperature below 35° F is anticipated, or when requested by the Engineer. When a Cold Weather Plan is required, pervious concrete shall not be placed without an approved Cold Weather Plan.

Under the Cold Weather Plan, the Contractor shall, provide a sufficient supply of straw, hay, blankets, or other suitable blanketing material and spread it over the pavement to a sufficient depth to prevent freezing of the concrete. The blanket material shall be placed on top of the sheet curing materials and covered with a layer of burlap or plastic sheeting, weighted or anchored to prevent the wind from displacing the insulation. At no time during the curing period shall the temperature of the pervious concrete be allowed to drop below 55° F. The Engineer may require recording thermometers if daytime temperature is below 50°. The curing period may be extended by the Engineer if the pervious concrete temperature has been allowed to drop below 55° F.

The cold weather protection shall be maintained for seven (7) days. Pervious concrete that has frozen during this period will be rejected.

**5-06.3(13) Protection of Pervious Concrete Pavement**

As part of the Construction Stormwater Pollution Prevention plan (SWPPP), rain runoff, surface water of any kind and sediment shall be prevented from entering the area of pervious concrete construction, including excavation, until the pervious concrete application has cured, testing is completed and determined to meet specifications and the adjacent areas that sheet flow/drain onto the pervious concrete are permanently stabilized from erosion and plantings are established. Once pavement is placed, flow diversion measures and protective covers shall continually be maintained until adjacent areas are permanently stabilized and concrete has been accepted. Construction vehicular traffic shall not be allowed onto the pervious concrete pavement.

Do not open the pavement to vehicular traffic until the concrete has cured for at least seven (7) uninterrupted days, testing has been completed, and the pavement has been accepted by the Engineer.

The Contractor shall take every precaution to protect the pervious concrete pavement from damage, including the introduction of foreign materials to the surface,

throughout the course of the work. Pervious concrete pavement that is damaged or has been adversely impacted by the introduction of foreign materials shall be remediated to the satisfaction of the Engineer or rejected and replaced to the nearest joint.

#### **5-06.4 Measurement**

Measurement for "Pervious Concrete Pavement - Sidewalk" will be by the square yard of finished surface of pervious concrete walk. No measurement will be made for blocked out areas, castings or other discontinuities in the sidewalk nine (9) square feet or larger.

Measurement for "Pervious Concrete Pavement-Vehicular" will be by the square yard for the finished surface of pervious concrete pavement. No Measurement will be made for blocked out areas, castings or other discontinuities in the pavement nine (9) square feet or larger.

#### **5-06.5 Payment**

Payment will be made in accordance with Section 1-04.1, for each of the following Bid Items that are included in the Proposal:

"Pervious Concrete Pavement - Sidewalk", per square yard.

The Unit contract price per square yard for "Pervious Concrete Pavement - Sidewalk" shall be full pay for furnishing all labor, tools, equipment and materials required to construct the pervious concrete sidewalk as specified in this Section, including but not limited to; performing mix designs, and placing pervious concrete.

"Pervious Concrete Pavement- vehicular", per square yard.

The Unit contract price for "Pervious Concrete Pavement-Vehicular" shall be full pay for furnishing all labor, tools, equipment and materials required to construct the pervious concrete pavement as specified in this Section, including but not limited to; performing mix designs, and placing pervious concrete.



## **Appendix C – Reference Materials**

WSDOT Environmental Procedures Manual (M 31-11), last modified June 2015:

<http://www.wsdot.wa.gov/Publications/Manuals/M31-11.htm>

WSDOT Geotechnical Design Manual (M 46-03), last modified May 2015:

<http://www.wsdot.wa.gov/Publications/Manuals/M46-03.htm>

WSDOT Materials Manual (M 46-01), last modified January 2016:

<http://www.wsdot.wa.gov/Publications/Manuals/M46-01.htm>

WSDOT General Special Provisions (GSPs):

[http://www.wsdot.wa.gov/Partners/APWA/Division\\_5\\_Page.htm](http://www.wsdot.wa.gov/Partners/APWA/Division_5_Page.htm)