# 40.360 SOLID WASTE AND RECYCLING

## 40.360.010 APPLICABILITY

This chapter shall apply to new multifamily residential buildings containing five (5) or more units and nonresidential construction that are subject to site plan review.

## 40.360.020 AMOUNT OF STORAGE REQUIRED

Amount of Storage Required. The amount of solid waste and recyclable storage area required is based on the predominant use(s) of the building, (i.e., residential, office, retail, educational/institutional or other). If a building has more than one of the uses listed in this section, and that use occupies twenty percent (20%) or less of the gross floor area of the building, the floor area occupied by that use shall be counted toward the floor area of the predominant use(s). If a building has more than one of the uses listed in this section, and that use occupies more than twenty percent (20%) of the gross floor area of the building, then the storage area requirement for the whole building shall be the sum of the requirement for the area of each use.

A. Storage areas for multiple uses on a single site may be combined and shared.

B. The specific requirements are based on an assumed storage height of four (4) feet for solid waste/recyclables. Vertical storage higher than four (4) feet but no higher than seven (7) feet may be used to accommodate the same volume of storage in a reduced floor space (potential reduction of forty-three percent (43%) of specific requirements). Where vertical or stacked storage is proposed, the site plan shall include drawings to illustrate the layout of the storage area and dimensions of containers.

C. Storage shall be provided consistent with the following:
   1. Multiunit residential buildings containing five (5) to ten (10) units shall provide a minimum storage area of fifty (50) square feet. Buildings containing more than ten (10) residential units shall provide an additional five (5) square feet per unit for each unit above ten (10).
   2. Nonresidential buildings shall provide a minimum storage area of ten (10) square feet, plus:
      a. Office: Four (4) square feet/1,000 square feet of gross floor area (GFA).
      b. Retail: Ten (10) square feet/1,000 square feet of GFA.
      c. Educational and Institutional: Four (4) square feet/1,000 square feet of GFA.
      d. Other: Four (4) square feet/1,000 square feet of GFA.

## 40.360.030 LOCATION, DESIGN AND ACCESS STANDARDS

Required storage areas for solid waste and recyclable materials shall comply with the following standards:

A. Location.
   1. The storage area for source-separated recyclables shall be located with the storage area for residual mixed solid waste.
   2. Indoor and outdoor storage areas shall comply with Uniform Building and Fire Code requirements.
   3. Storage area space requirements can be satisfied with a single location or multiple locations, and can combine both interior and exterior locations.
   4. Outdoor storage areas can be located within interior side setback or rear setback areas. Outdoor storage areas shall not be located within a required front setback or in a setback abutting a public right-of-way or private street easement unless no alternative location is possible. Outdoor storage areas shall not be located in a side or rear setback which abuts property that is not within the same development (perimeter setback of the development as opposed to the side setback of one project on one interior lot within the development).
   5. Exterior storage areas shall be located in central and visible locations on a site to enhance security for users.

6. Exterior storage areas can be located in a parking area, if the proposed use provides at least the minimum number of parking spaces required for the use after deducting the area used for storage and access.
7. The storage area shall be accessible for collection vehicles and located so it will not obstruct pedestrian or vehicle traffic movement on the site or on public streets adjacent to the site.

B. Design Standards.
1. The dimensions of the storage area shall accommodate containers consistent with current methods of local collection.
2. Storage containers shall meet Uniform Fire Code standards and be made of and covered with waterproof materials or situated in a covered area.
3. Exterior storage areas shall be enclosed by a screen to at least an F2 standard. A gate(s) through the fence shall allow access to users and haulers. The gate(s) for haulers shall be capable of being secured in a closed and open position.
4. Storage containers shall be clearly labeled to indicate the type of materials accepted.

C. Access Standards.
1. Access to storage areas can be limited for security reasons. However, the storage area shall be accessible to users at convenient times of the day, and to collection service personnel on the day and approximate time they are scheduled to provide collection service.
2. Storage areas shall be designed to be easily accessible to collection trucks and equipment, considering paving, grade and vehicle access. A minimum of ten (10) feet horizontal clearance and eight (8) feet of vertical clearance is required if the storage area is covered.
3. Storage areas shall be accessible to collection vehicles without requiring backing out of a driveway onto a public street. If only a single access point is available to the storage area, adequate turning radius shall be provided to allow collection vehicles to safely exit the site in a forward motion.

# 40.370 SEWER AND WATER

## 40.370.010 SEWERAGE REGULATIONS

A. Purpose. The purpose of this section is to further the public health by providing clear rules for when connection to public sewer is required or prohibited. Nothing in this section shall be construed to permit violation of regulations for on-site sewage disposal systems promulgated by the Washington Department of Health or local governments.

B. Definitions.
   1. "Public sewer" means extension of a public sewer system operated by a public entity or, where such extension is impractical, connection to an alternative public sewer system operated by the designated public sewer purveyor.
   2. "UGA" means an urban growth area designated in the comprehensive plan.

C. New structures within UGA—Public sewer connection required--Exceptions. Inside UGAs, connection to public sewer is required as a condition of building permit issuance for any new structure unless the responsible official determines, using a Type I review process that one of the following exceptions applies:
   1. The new structure is an alteration, expansion or replacement of an existing structure which will not entail a material increase in sewage effluent production.
   2. The new structure lawfully incorporates no on-site sewage system.
   3. The new structure is for single-family detached residential use, or a non-residential use, generating a projected effluent flow of not more than seven hundred (700) gallons per acre per day, if:
      a. Such use does not generate hazardous/ dangerous waste, as defined by applicable federal, state or local law; and
      b. Extension of public sewer is impractical based upon the following criteria:
         (1) Public sewer would have to be extended more than three hundred (300) feet; or
         (2) Necessary permission cannot be obtained from intervening landowner(s); or
         (3) Intervening property contains natural or manmade obstructions, such as deep canyons, elevation changes, and solid rock impediments, which make public sewer extension prohibitively expensive or undesirable; and
      c. A covenant to the county surveyor or purveyor is recorded which commits the current future property owner(s) to connect to public sewer within twelve (12) months of sewer becoming available. The covenant shall also contain a provision that commits the current future property owner(s) to participate in a future local improvement district if this is the method used to extend sewer.

D. Land divisions within UGA—Public sewer connection required--Exceptions. Inside UGAs, connection to public sewers is required as a condition of approval of new land divisions, whether by plat, short plat or site plan application, unless the following exception applies:
   1. A two (2)-lot land division where one of the lots is, or will be, developed in a use that generates no sewage effluent. Any plat approved under this exception shall record a covenant prohibiting the installation of plumbing fixtures for any use on the designated lot unless the lot connects to sewer.
   2. Short-plats approved under Section 40.200.050(B).

E. Public sewer connection prohibited outside UGAs—Exceptions. For proposed structures or other developments outside of a UGA, connection to public sewer is prohibited except as follows:
   1. In response to documented health hazards; or
   2. To provide public sewer to regional park facilities, K-12 public schools or to uses within the urban reserve district otherwise required to be served by public sewer; or
   3. In designated rural centers, public sewer is required when available; or
   4. Where the county has contractually committed to permit public sewer connection.

If sewer is extended, the maximum number of permitted hookups should be specified at the time of extension and no additional development exceeding this number should be permitted.

F. Period of validity. A Type I decision under this section shall be valid for a period of one year if not associated with any other action. When such a decision is made in conjunction with another application (e.g., short plat, plat or site plan), the decision shall be valid for the same period as the decision on the related application.

## 40.370.020 WATER SUPPLY

A. Definitions.
   1. For the purpose of this section, "public water system" means a potable water supply system operated by a designated public agency including a city, town or Clark Public Utilities.

B. Purpose. Water serving new development in urban areas is necessary.

C. Connection required for building permits.
   1. Inside urban growth boundaries, connection to public water is required as a condition of building permit issuance for multifamily dwellings exceeding three (3) units, and all structures required to meet fire flow standards.
   2. In areas located inside urban growth boundaries, where the public agency purveyor is willing and able to provide safe and reliable service, connection to public water is required as a condition of building permit issuance for all new residential uses of less than four (4) units, and other uses that are not required to meet fire flow standards, when public water is within seven hundred fifty (750) feet of the lot. Subject to a Type I review, the responsible official may conclude that public water is not available to the developer with reasonable economy and efficiency, within the above distances, based on the following considerations:
      a. Permission cannot be obtained from intervening property;
      b. Intervening property contains natural or man-made obstructions which make extension extraordinarily expensive, such as a deep canyon, solid rock or reconstruction of a road or sidewalk;
      c. Intervening changes in elevation make adequate service to the property extraordinarily expensive.

D. Connection required for land divisions. Inside urban growth boundaries, connection to public water is required for all new lots, as a condition of preliminary plat or short plat, and site plan approval. Priority for public water service will be the extension from an existing public water line and, secondly, by construction of, or connection to, a satellite system built to standards established, and operated, by the designated water purveyor in the applicable water service area. Where the purveyor refuses to accept the option of accepting a satellite system the third option is to approach an adjacent purveyor for service. No private wells shall be permitted for purposes of providing potable water intended for human consumption.

# 40.380 STORMWATER AND EROSION CONTROL

## 40.380.010 PURPOSE

The purpose of this chapter is to:

A. Prevent surface and groundwater quality degradation and prevent erosion and sedimentation of creeks, streams, ponds, lakes, wetlands and other water bodies;

B. Prevent damage to property from increased runoff rates and volumes;

C. Protect the quality of waters for drinking water supply, recreation, fishing and other beneficial uses;

D. Establish sound developmental policies which protect and preserve the county's water resources;

E. Protect county roads and rights-of-way from damage due to inadequately controlled runoff and erosion;

F. Preserve and enhance the aesthetic quality of the county's water resources;

G. Protect the health, safety and welfare of the inhabitants of the county;

H. Maintain existing groundwater levels, in-stream flows, and available water supply volumes;

I. Further the goals of no net negative impact caused by quantity of runoff entering streams and no net negative change in the quality of runoff entering streams through the implementation of best management practices; and

J. Minimize erosion and control sediment from land development and land-disturbing activities.

## 40.380.020 APPLICABILITY

A. For the purposes of this chapter, "development" means the following activities:
   1. land disturbing activities,
   2. structural development (excluding the replacement of roofs), including construction or installation of a building or other structure;
   3. creation of impervious surfaces;
   4. Class IV-General Forest Practices that are conversions from timber land to other uses; and subdivisions, and
   5. short subdivisions and binding site plans, as defined in RCW 58.15.020.

B. Development Activity. In this section, "development activity" means actions meeting the applicability criteria of subsection (D)(1) through (D)(8) below.

C. Small parcel developments and large parcel developments shall implement erosion control plan(s) in conformance with Sections 40.380.050 and 40.380.060.

D. The provisions of this section apply to all development activities or redevelopment that:
   1. Results in five thousand (5,000) square feet or more of new impervious area within the rural area;
   2. Results in two thousand (2,000) square feet or more of new impervious surface within an urban area;
   3. Result in the addition or replacement of more than one thousand (1,000) square feet of impervious surface for any of the development activities, or redevelopment listed in Sections 40.380.040(B)(7)(a) and 40.380.040(B)(7)(b), building areas excluded; or

4. Result in the platting of single-family residential subdivisions in an urban area.

If redevelopment results in five thousand (5,000) square feet or more of replaced impervious surface, then the provisions of Section 40.380.040(B)(3) apply.

E. The provisions of this section apply to drainage projects.

F. Provisions of this section apply to all land-disturbing activities except those exempted in Section 40.380.030(A).

G. Meeting the requirements of this section is the joint and severable responsibility of both the property owner on whose parcel the activity occurs and the person undertaking such activity. In addition, if the land-disturbing activity involves a county-issued permit, the applicant is also responsible for meeting the requirements of this section.

H. The responsible official is authorized to enforce the provisions of this section using the remedies and procedures in Title 32 of the Clark County Code.

## 40.380.030 EXEMPTIONS AND EXCEPTIONS

A. Exemptions shall be granted for the following conditions:
   1. Commercial agricultural, and forest practices regulated under Title 222 WAC, except for Class IV General Forest Practices that are conversions from timber land to other uses, are exempt from the provisions of the minimum requirements. All other new development is subject to the minimum requirements;
   2. Normal landscape maintenance activities and gardening;
   3. Land-disturbing activities of less than one (1) acre that do not result in additional impervious surface are exempt from Sections 40.380.040(B) and (C);
   4. School modulars or portables are exempt from Sections 40.380.040(B) and (C), provided the buildings utilize roof downspout systems to infiltrate roof runoff. A final stormwater design that addresses disposal of stormwater shall be required;
   5. The construction of single-family homes, duplexes, and their accessory structures may be exempted from Section 40.380.040(B), Section 40.380.040(C), and Section 40.380.040(C)(4), provided the following conditions are met:
      a. The development site or parcel is included in an approved stormwater facility system meeting the requirements of this chapter,
      b. The system provides for detention or retention of runoff from residential lots, and
      c. An erosion control plan is prepared and implemented;
   6. The construction of single family homes, and their normal appurtenances and accessory structures, on an existing lot within the rural area shall be exempt from Sections 40.380.040(B) and (C).
   7. Drainage projects that are not a part of a development activity or redevelopment under Section 40.380.040(B)(3) are exempt from Section 40.380.040(B) and the responsible official may waive all or parts of Sections 40.380.060, 40.380.040(H), and Section 40.380.040(J) if the project meets the other appropriate parts of this chapter;
   8. Small residential projects that create less than two thousand (2,000) square feet of new impervious surface in urban areas and five thousand (5,000) square feet in rural areas, and infill projects that meet the eligibility requirements of Section 40.260.110(B)(1), that create less than five thousand (5,000) square feet of new impervious surface are exempt from Section 40.380.040(B) and Section 40.380.040(C). Houses that utilize roof downspout systems to infiltrate roof runoff may be deducted from area calculations. A final stormwater plan is required if stormwater is conveyed off site. The submittal requirements (Section 40.380.060) for small residential projects are modified as follows:
      a. An abbreviated preliminary stormwater plan as outlined in Section 40.380.060(B) can be substituted for the preliminary stormwater plan,

b. A Technical Information Report (40.380.060(D)(4)) shall not be required. However, sufficient information and data shall be provided with the final stormwater plan to allow the responsible official to determine conformance with the applicable provisions of this section;

9. Government Agency Projects. Development activities and drainage projects undertaken by governmental agencies are exempt from Section 40.380.040(J);
10. A preliminary stormwater plan is not required when a development is already provided for in a previously approved plan.
11. Agriculture. In this section, agricultural uses must occur on property that is either:
    a. participating in a current use assessment classification for agricultural land pursuant to RCW 84.34 or is eligible for such current use assessment classification;
    b. conducted under a farm management plan approved by Clark conservation district; or
    c. conducted under a farm management plan that is approved by the Clark conservation district within two years of the adoption of this section. The plan shall require site specific management measures for minimizing non-point pollution from agricultural activities excluding runoff from existing buildings.

B. Exceptions to the requirements of this section may be granted prior to permit approval and construction. An exception may be granted following a Type III process, provided that a written finding of fact is adopted, that addresses the following:
    1. The exception provides for equivalent environmental protection and is in the overriding public interest; and that the objectives of safety, function, environmental protection and facility maintenance, based upon sound engineering, are fully met;
    2. That there are special physical circumstances or conditions affecting the property such that the strict application of these provisions would deprive the developer of all reasonable use of the parcel of land in question, and every effort to find creative ways to meet the intent of the requirements has been made;
    3. That the granting of the exception will not be detrimental to the public health and welfare, nor injurious to other properties in the vicinity and/or downstream, and to the quality of waters of the state; and
    4. The exception is the least possible exception that could be granted to comply with the intent of this section.

    Prior to commencing construction, the applicant must show that no sediment can be transported from the site. No degradation of the environment or drainage facilities may result from the proposed activity, even in the absence of BMP's. Criteria for approval are non-erodible soils, runoff discharges to a temporary infiltration device, or runoff discharges to an on-site closed depression.

C. Other.
    1. Construction Tolerances. The responsible official may approve deviations of up to ten percent (10%) from an approved design using a Type I procedure upon findings that water quality, water quantity control, and maintainability are not affected.
        a. The responsible official may require the revision of a previously approved preliminary or final stormwater control plan using a Type II post-decision review whenever the developer proposes a modification to the previously approved activity that creates additional adverse impacts.

**40.380.040 STORMWATER CONTROL**

A. Design standards.
    1. Stormwater facilities shall be designed and constructed in accordance with 1998 Standard Specifications for Road, Bridge, and Municipal Construction, and updates as prepared by Washington Department of Transportation (WSDOT); and the BMP manual.

B. Water quality treatment.
    1. General Standards.
        a. All development activities and redevelopment, unless exempted in Sections 40.380.020 and 40.380.030 of this section, shall provide treatment of stormwater runoff through the use of BMPs specified in this section and in accordance with the BMP manual.

b. Treatment BMPs shall be sized to capture, hold and treat the water quality design storm, defined as seventy percent (70%) of the two (2) year recurrence interval twenty-four (24) hour storm runoff event.
c. If site conditions are appropriate and groundwater quality will not be impaired, infiltration is the preferred BMP. Direct discharge of untreated stormwater to groundwater is prohibited. All discharges to groundwater shall comply with the following state laws: the Water Pollution Control Act (RCW 90.48), the Water Resources Act (RCW 90.54), and Water Quality Standards for Ground Waters of the State of Washington (WAC 173-200). Infiltration may be limited near public water supply wells.
d. The BMPs cited in this section shall be sited, designed and constructed in accordance with the requirements detailed in the BMP manual for each BMP, with the following exceptions:
   (1) For biofiltration swales (RB.05) and vegetative filter strips (RB.10) alternative design criteria from the publication Biofiltration Swale Performance, Recommendations, and Design Considerations--Appendix G by the Municipality of Metropolitan Seattle, water pollution control department, dated October 5, 1992 shall be used;
   (2) Where provisions of this section conflict with the BMP manual or other cited design guidance, this chapter shall take precedence.

2. Off-Site Analysis.
   a. All development activities and redevelopment required to prepare a final stormwater control plan shall conduct an analysis of off-site water quality impacts resulting from the development activity or redevelopment and shall mitigate these impacts. The analysis shall extend a minimum of one-fourth (1/4) of a mile downstream from the development site. The applicant shall use best efforts to obtain this data while respecting private property. The existing conditions and potential impacts to be evaluated shall include, at a minimum, but not be limited to:
      (1) Excessive sedimentation;
      (2) Streambank erosion;
      (3) Polluted discharges to ground water contributing to recharge zones;
      (4) Violations of water quality standards;
      (5) Spills and discharges of priority pollutants, as defined by the Federal Clean Water Act.
   b. Existing off-site impacts that are not affected by the development activity or redevelopment do not require mitigation. However, in cases where the subject property was the cause of the existing impact, it is the responsibility of the applicant to either mitigate or provide technical information and analysis demonstrating that no increased impact will result.
   c. The above mitigation, where required for streambank erosion, is in addition to the basic requirement for water quantity control. The additional mitigation will take the form of acceptable BMPs for downstream erosion control (subsection (B)(4)(c)). The publication entitled Integrated Streambank Protection Guidelines published by the Washington Department of Fish and Wildlife, shall be utilized to guide design and installation of streambank erosion BMPs within and adjacent to streams. Other types of impacts will require mitigation of a type to be determined by the responsible official.
   d. All discharges to surface waters shall comply with the following state laws: the Water Pollution Control Act (RCW 90.48) and Water Quality Standards for Surface Waters of the State of Washington (WAC 173-201 A).
   e. Except within the Lacamas Basin, treatment of runoff from sidewalks and bike paths is not required if the stormwater drains away from roadways. Runoff from sidewalks and bike paths that mix with roadways will require treatment.

3. Redevelopment.
   a. Where redevelopment of five thousand (5,000) square feet or more occurs within urban growth boundaries, rural centers, or urban reserve zoning districts, the requirements of Sections 40.380.020, 40.380.030, 40.380.040, and 40.380.050 of this section shall apply to that portion of the site that is being redeveloped; provided, that non-pollution-generating land-disturbing activities are exempted from the water quality provisions of subsection (B)(4). Source control BMPs of Article III (Chapter 1-4 of the BMP manual) shall be applied to the entire parcel(s) upon which the redevelopment project is occurring. A stormwater plan shall be prepared and shall include a maximum five-year schedule for implementing source control BMPs.

b. In addition to the above requirements, where one or more of the following conditions apply, a stormwater plan shall include a maximum five-year schedule for: implementing all of the water quality requirements of Section 40.380.040 for those areas of the parcel draining into or from the redeveloped area; and implementing all quantity control requirements to the maximum extent practicable for the entire parcel(s) upon which the redevelopment project is occurring. An adopted and implemented basin plan may be used to establish redevelopment requirements that are tailored to a specific basin.
   (1) Existing parcel(s) greater than one (1) acre in size with fifty percent (50%) or more impervious surface;
   (2) Parcel(s) that discharge to receiving water that has a documented water quality problem shall implement all of the requirements appropriate to the identified problem. The responsible official shall maintain and make available to applicants a listing of water bodies with documented water quality problems.

c. An applicant may apply for a modification to the requirements of subsection (B)(3)(b). The request for modification shall be proposed in conjunction with the application for the underlying redevelopment proposal in accordance with Chapter 40.500; provided, that where the modification request is filed subsequent to the decision on the development proposal, such request shall be processed in accordance with the post-decision review procedures of Section 40.520.110.and subject to the fees listed in Section 6.110.020 of Title 6. The modification application, to be filed with the Community Development department shall include a written request including the following information:
   (1) A map showing applicable existing conditions such as contours, wetlands, significant trees, lakes and rivers, utilities, property lines, existing and proposed roads and roadways, existing structures in impervious areas, existing drainage conditions and flow patterns, and existing stormwater facilities;
   (2) An analysis of existing stormwater runoff quality and quantity being discharged from the entire parcel(s);
   (3) An analysis of the stormwater quality and quantity impacts of the redevelopment proposal;
   (4) The requirements of subsection (B)(3)(b) which the applicant is requesting to be modified or waived;
   (5) A comparison of the cost of compliance with the water quality and quantity control requirements of subsection (B)(3)(b) contrasted to the costs of compliance with the water quality and quantity control requirements of subsection (B)(3)(a);
   (6) An analysis of the differences in stormwater quality and quantity treatment that would result from granting the request for modification as opposed to complying with the requirements of subsection (B)(3)(b); and
   (7) A discussion of the reasons why compliance with the requirements of subsection (B)(3)(b) is unduly burdensome.

d. A stormwater variance to modify the requirements of subsection (B)(3)(b) shall be granted if it is determined that complying with those requirements would be unduly burdensome. In making this determination, consideration shall be given to:
   (1) the seriousness of existing stormwater quantity and quality problems generated from the site;
   (2) the extent to which the stormwater problems would be aggravated by the redevelopment proposal;
   (3) the degree to which the imposition of the requirements of subsection (B)(3)(b) would alleviate the stormwater problems;
   (4) the extent to which the request for modification would lessen the treatment of the stormwater problems;
   (5) the cost of complying with subsection (B)(3)(b) as compared to the cost of complying with the requirements of Section 40.380.040(B)(3)(a). If the cost of complying with subsection (B)(3)(b) is more than the cost of Article III requirements imposed by subsection (B)(3)(a) of this section, then it shall be presumed that subsection (B)(3)(b) requirements are unduly burdensome.

e. If it is determined that full compliance with the requirements of subsection (B)(3)(b) would be unduly burdensome, the review authority shall determine which requirements of subsection (B)(3)(b) shall be

imposed to provide the most effective treatment of stormwater impacts generated by the entire site without imposing an undue burden on the applicant.

f. In the case of public works projects to widen or otherwise redevelop an existing road, the site for which water quality treatment is required shall include only the portion of road which fronts on, and drains to or from, the redevelopment.

4. Standard BMPs.
   a. Standard stormwater treatment BMPs shall be used to treat stormwater throughout Clark County, except for certain development activities in the Lacamas watershed as noted in Section 40.380.040(C)(5)(a).
   b. Acceptable standard treatment BMPs may, depending upon circumstances and site characteristics, include the following from the BMP manual (Chapters III-3, III-4, and III-6):
      (1) RI.05--WQ Infiltration basin;
      (2) RI.10--WQ Infiltration trench;
      (3) RI.15--Roof downspout system;
      (4) RD.09--Constructed wetland;
      (5) RD.06--Wet pond with marsh;
      (6) RD.05--Wet pond without marsh;
      (7) RB.05--Biofiltration swale;
      (8) RB.10--Vegetative filter strip;
      (9) RF.05--Sand filtration basin;
      (10) RF.10--Sand filtration trench.
      (11) Cartridge filters using compost, perlite, and geolite.
   c. Acceptable BMP's for downstream erosion control may, depending upon circumstances and site characteristics, include the following from the BMP manual:
      (1) E1.25--Preserving natural vegetation;
      (2) E1.30--Buffer zones;
      (3) E1.35--Permanent seeding and planting;
      (4) E1.40--Sodding;
      (5) E1.45--Topsoiling;
      (6) E2.70--Outlet protection;
      (7) E2.75--Riprap;
      (8) E2.80--Vegetative streambank stabilization;
      (9) E2.85--Bioengineering methods of streambank stabilization;
      (10) E2.90--Structural streambank stabilization;
      (11) The applicant may elect to provide additional BMPs in accordance with the following chapters and sections of the BMP manual as a method of mitigating off-site impacts:
         (a) Chapter III-4.2 Runoff Treatment and Streambank Erosion Control;
         (b) Section III-4.2.1 Background;
         (c) Section III-4.2.2 Mechanisms of Pollutant Removal;
         (d) Section III-4.2.3 Classification of Detention BMP's;
         (e) Chapter III-4.3 General Design Criteria;
         (f) Section III-4.3.1 Hydrologic Analysis;
         (g) Section III-4.3.2 Sizing Detention BMP's for Runoff Treatment;
         (h) Section III-4.3.3 Sizing Detention BMP's for Streambank Erosion Control.
   d. Sand filtration BMPs (RF.05 and RF.10) are not allowed on commercial or industrial sites where the effluent from the treatment systems will drain to groundwater.
   e. For biofiltration swales and vegetative filter strips, the hydraulic residence used for design shall be no less than nine (9) minutes. Swale slopes, however, may be no less than one percent (1%) unless underdrains are provided. Swales shall have a free discharge. When placed within a detention basin, calculations shall be provided that demonstrate that the peak stage during the water quality design storm is lower than the minimum swale elevation.
   f. Permanent infiltration BMPs shall not be used as temporary erosion control devices.

g. Alternative roof downspout systems that provide an equivalent level of performance to the system in the BMP manual (RI.15) may be approved by the responsible official. Roof downspout systems can be constructed without observation wells.

5. Advanced BMPs for Nutrient Control.
   a. Advanced control of nutrients is required in the Lacamas watershed above the dam at the south end of Round Lake, for all development sites exceeding one (1) acre in size. All water leaving the site during the water quality design storm shall be treated.
   b. Acceptable BMP's for achieving advanced nutrient control may, depending upon circumstances and site characteristics, include the following from the BMP manual (Chapters III-3 and III-4):
      (1) RI.05--WQ Infiltration basin;
      (2) RI.10--WQ Infiltration trench;
      (3) RI.15--Roof downspout system;
      (4) RD.09--Constructed wetland;
      (5) RD.06--Wet pond with marsh;
6. Source Control BMPs. In addition to the other water quality treatment requirements in this section, commercial, industrial and public works development activities and redevelopment shall, to the maximum practicable, be designed in accordance with Chapter IV of the BMP manual and utilize BMPs specified in Chapters IV-2, IV-3 and IV-4 of the BMP manual.
7. Oil/Water Separators.
   a. Development activities or redevelopment creating the following facilities require API or CPS-type oil/water separators:
      (1) Industrial machinery and equipment, trucks and trailer aircraft, parts and aerospace, railroad equipment;
      (2) Log storage and sorting yards;
      (3) Airfields and aircraft maintenance;
      (4) Fleet vehicle yards;
      (5) Railroads;
      (6) Gas stations;
      (7) Retail/wholesale vehicle and equipment dealers;
      (8) Vehicle maintenance and repair;
      (9) Construction businesses such as paving, heavy equipment storage and maintenance, storage of petroleum products. (This does not include construction sites);
      (10) Other activities that exhibit a significant risk of high oil loading in runoff.
   b. Development activities and redevelopment creating the following facilities shall require spill control (SC) type oil/water separators:
      (1) Restaurants;
      (2) Duplex or Multifamily residential development activities creating parking spaces for twenty-five (25) or more vehicles;
      (3) Other activities where the risk of oil spills or illegal dumping of oil or grease is significant.
   c. For development activities and redevelopment cited in Section 40.380.040(B)(7)(a) and Section 40.380.040(B)(7)(b), oil/water separators shall not be required on portions of a site where the risk of oil or grease spills or dumping is minimal.
   d. Oil/water separators shall be designed in accordance with Chapter III, Section III-7 of the BMP manual.
8. Infiltration BMPs on Industrial and Commercial Sites.
   a. Infiltration of stormwater runoff shall not be allowed on commercial industrial sites that, due to location or the proposed use, pose a significant threat of contamination to groundwater.
   b. Approval for use of infiltration BMPs (RI.05-30 in the BMP manual) on industrial and commercial sites, including gas stations, shall be conditioned on all the following criteria, unless found inappropriate by the responsible official:
      (1) Analysis of the potential for groundwater contamination from the site. This analysis shall include a soils and groundwater evaluation if deemed appropriate by the responsible official;

(2) Demonstration that no other feasible alternative exists for disposing of stormwater from the site;
(3) A "state waste discharge permit," as described in WAC 173-216, obtained from the Washington Department of Ecology, where required by the state, and other state permits and approvals as appropriate.

c. The requirements of subsection (B)(8)(a) of this section shall not apply to runoff from portions of a site where the risk of groundwater contamination is no greater than single-family residential sites. Examples of these areas include rooftop drainage, runoff from undeveloped portions of a site, and drainage from portions of parking lots where the risk of illegal dumping is minimal.

d. In cases where infiltration is allowed on commercial and industrial sites and a significant risk of groundwater contamination exists, the responsible official may require groundwater monitoring to insure against groundwater contamination. The responsible official may also require an agreement from the applicant for full mitigation in the event of groundwater contamination.

e. The provisions of this subsection do not apply to non-industrial and noncommercial sites that are defined under the NPDES permit system as industrial due to temporary construction activity.

9. Experimental BMPs.
   a. Experimental best management practices are those which have not been fully tested and evaluated by the county or the Washington Department of Ecology and are not included as accepted practices in this code or the BMP Manual. Experimental BMPs that are adequately tested and proven effective shall be incorporated into this section as standard or accepted BMPs in the future.
   b. Experimental BMPs may be allowed if all the following conditions are met:
      (1) The experimental BMP usage is part of a Washington Department of Ecology or Clark County research project;
      (2) Monitoring of the effluent quality produced by the BMP, as well as influent quality, will be conducted for at least two (2) years;
      (3) Results of the research will be published;
      (4) Financing is available to construct the BMP, conduct the testing and publish the results.
   c. The responsible official may approve use of alternative water quantity and/or water quality treatment devices that are acceptable for projects meeting the eligibility requirements of Section 40.260.110 with evidence from the applicant that water quality, water quantity control, and maintainability are not affected.
10. Drainage Structure Labeling and Signage.
   a. All catch basins and manholes capable of accepting stormwater shall be stenciled. For infiltration systems stenciling shall read: "Please protect--Drains to Drinking Water."
   b. For facilities draining to surface waters the stenciling shall read: "Please protect--Drains to (name of water body)."
   c. Signs shall be installed along water quality biofiltration systems that read: "Water Quality Filter--Please Leave Vegetated."
   d. Fenced detention and retention basins shall be marked with a sign that reads "[Public/Private] Stormwater Control Facility."

C. Quantity control.
1. General Standards.
   a. All development activities and redevelopment, unless exempted in Section 40.380.030, shall provide quantity control of stormwater runoff in accordance with the requirements of this section.
   b. Natural drainage flow routes to streams and wetlands shall be maintained, and discharges from the site shall occur at the natural location and elevation, to the maximum extent practicable.
   c. Transfer of runoff from one basin to another shall not be allowed.
   d. Surface water exiting a parcel shall be discharged with adequate energy dissipaters within the development site to prevent downstream damage.
   e. In addition to the requirements of Chapter 40.420, no reduction of existing conveyance capacity and no net loss of existing storage capacity for the one hundred- (100) year storm is permitted in special flood hazard areas as defined in Section 40.420.010(C)(3). This requirement shall also apply to all areas

within the limits of the existing one hundred- (100) year floodplain, as determined by hydrologic/hydraulic computations in accordance with this section, for all streams and man-made channels within Clark County.

f. Where provisions of this section conflict with the BMP manual or other cited design guidance, this section shall take precedence.

g. No development within an urban growth area shall be allowed to materially increase or concentrate stormwater runoff onto an adjacent property or block existing drainage from adjacent lots. This requirement shall not apply to existing drainageways. This shall apply to all new residential lots less than twenty thousand (20,000) square feet in size and all nonresidential developments within the urban growth area created after September 10, 1996. Alterations or remodels that increase the building footprint by less than fifty percent (50%) are exempt from this provision.

h. All lots within the urban growth area must be designed to provide positive drainage from bottom of footings to an approved stormwater system. Positive drainage may be accomplished by swales, drywells, french drains, laterals to the street, laterals behind the curb or within a public utility easement, an approved system in the side or rear setback, or some other method acceptable to the responsible official.

2. Hydrologic and Hydraulic Analysis.

a. Hydrologic and hydraulic analysis shall be in accordance with Chapters III-1 and III-2 of the BMP Manual, with the following exceptions:

(1) Table III-1.6, Hydrologic Soil Groups for Soils in the Puget Sound Basin, is replaced by Hydrologic Soil Groups for Soils in Clark County. (Source: SCS TR-55, Second Edition, June 1986, Exhibit A-1. Revisions made from SCS, Soils Interpretation Record, Form #5, September 1988.) Alternatively, hydrological soil groups can be developed by registered soil scientist using criteria set in the USDA, SCS National Soils Handbook.

(2) Appendix AIII-1.1, Isopluvial Maps for Design Storms, is replaced by Isopluvial Maps for Design Storms in Clark County. (Source: NOAA Atlas 2, Precipitation—Frequency Atlas for the Western United States, Volume IX--Washington.)

(3) The HEC-1 Flood Hydrograph Package computer program, developed by the Hydrologic Engineering Center, U.S. Army Corps of Engineers is an acceptable hydrologic computation program for use in Clark County.

(4) Design of stormwater collection systems shall be in accordance with Hydraulic Engineering Circular #12, Drainage of Highway Pavements, 1984 Edition, published by the United States Department of Transportation, Federal Highway Administration (FHWA).

b. Table III-1.3, SCS Western Washington Runoff Curve Numbers of the BMP Manual shall be used to calculate predevelopment and post-development runoff with the following constraints:

(1) Predevelopment land use shall be established as the use over the last thirty (30) years which results in the least amount of site runoff, as demonstrated by evidence acceptable to the responsible official. Acceptable evidence may include, but not be limited to thirty (30) year old aerial photos, crop history or tax assessor records.

(2) Redevelopment of existing sites less than ten thousand (10,000) square feet in area can assume predevelopment land use equivalent to the facility being redeveloped.

3. Design Methodology for Quantity Control Facilities.

a. Except as limited by Section 40.380.040(B)(8) for commercial and industrial sites, infiltration of the one hundred (100) year storm is the preferred method for all stormwater disposal from development sites where local soil types and groundwater conditions are suitable (in general, soils classified as A-1-a, A-1-b, A-3, A-2-4, and A-2-5 as defined in AASHTO Specification M145) provided that water quality treatment as detailed in Section 40.380.040 is provided prior to infiltration. Soil suitability for infiltration shall be determined by a qualified geo-technical engineer through both approved field testing and laboratory testing.

b. The design infiltration rate for infiltration systems shall be limited to one-half (1/2) the measured infiltration rate. Infiltration rates shall be tested on-site for all soils. The responsible official may require a representative drywell be tested after completion of the stormwater improvements to verify

design infiltration rates. The test results shall be submitted to the county by the project engineer prior to completing construction of the stormwater facilities. Redesign may be required if tested rates are less than those utilized in the design. The tests may be waived during preparation of the preliminary plans if the engineer presents credible test results from properties within one-quarter (1/4) mile distance from the development.

c. The responsible official may allow the base of infiltration facilities to be less than three (3) feet above seasonal high water or an impermeable layer if the quality and quantity control requirements of this chapter can be met and a groundwater mounding analysis verifies that the facility will function as required

d. For surface runoff leaving a development site, the following criteria shall be met:
   (1) The peak release rate for the two- (2) year design storm after development shall not exceed one-half (1/2) the pre-developed two- (2) year design storm peak runoff rate.
   (2) The peak release rate for the ten- (10) and one hundred- (100) year design storms after development shall not exceed the respective predevelopment design storm peak rates.
   (3) After meeting the requirements of Section 40.380.040(C)(3)(d)(1) and Section 40.380.040(C)(3)(d)(2), the pond volume shall be increased by either the following multiplication factor F: F = (composite curve number /46)-0.6 or by using Figure III-1.1 in section III of the BMP Manual. This correction factor is to be applied to the volume of the pond without changing its depth or the design of its outlet structure, which shall result in an increase in surface area.

e. To insure the standards in this section are met, the volume available for storing runoff in a stormwater facility shall be increased to allow for storage of high seasonal groundwater and/or ordinary high water.

f. Residential and commercial structures shall be designed to direct roof runoff to downspout roof systems in areas that contain soils of AASHTO M145 types A-1-a, A-1-b, A-3, A-2-4, and A-2-5 where the measured infiltration rate is equal to or greater than eight (8) inches per hour. The system shall be designed to discharge a minimum two- (2) year twenty-four (24) hour design storm into the ground. Runoff from roofs during the ten- (10) and one- hundred- (100) year storms shall be included in the postdevelopment design flow of the site facility(s) unless provided for in the roof system. Infiltration tests shall be provided for all proposed roof downspout systems prior to final stormwater plan approval. Infiltration is not required in the rural area, or in erosion hazard areas as defined in Section 40.100.

g. The responsible official may waive this requirement upon written findings by a qualified geo-technical engineer demonstrating that such infiltration is unsuitable and roof runoff is conveyed to an approved water quantity control facility.

h. Design of stormwater control facilities shall be in accordance with the following methods from the BMP Manual (Chapters III-1 and III-3):
   (1) Section III-1.4.4—Hydrograph Routing;
   (2) Section III-1.4.5—Hydrograph Summation and Phasing;
   (3) Section III-1.4.6—Computer Applications;
   (4) Section III-1.5--Closed Depression Analysis;
   (5) Section III-3.3—Feasibility Analysis and General Limitations for Infiltration BMP's;
   (6) Section III-3.4--General Design Criteria for Infiltration and Filtration BMP's;
   (7) Section III-3.5—Construction and Maintenance;
   (8) Section III-4.3--General Design Criteria;
   (9) Section III-4.4--Standards and Specifications for Detention Ponds.

4. Conveyance Systems.
   a. Open channel conveyance systems incorporating water quality treatment, habitat improvement and emergency overland flood relief routes shall be utilized to the maximum extent practicable.
   b. Stormwater conveyance elements to transport water within and from a development activity site shall be sized to carry flows from the "design storm" from the contributing drainage area based upon the

projected full build-out of that contributing drainage area, and be fully compatible with existing downstream conveyance elements and flow conditions.

c. For stormwater conveyance design, the "design storms" shall be as follows:
   (1) Ten- (10) year storm: contributing drainage areas less than forty (40) acres;
   (2) Twenty-five- (25) year storm: contributing drainage areas of forty (40) acres or more;
   (3) One hundred- (100) year storm: culverts with contributing drainage areas greater than two hundred- (200) acres, culverts in areas of special flood hazard as described in Federal Emergency Management Agency Fire Insurance Rate Maps (FIRM) and reports for Clark County, culverts where upsizing in order to meet design requirements for the one hundred- (100) year storm is required.

d. Development sites shall be planned to be able to pass a one hundred- (100) year storm through the site.

e. Closed conveyance system elements shall be designed to operate in an open flow, not pressure flow regime except during the one hundred- (100) year storm.

f. Runoff from the one hundred- (100) year storm may leave pipes and channels but shall not rise to elevations more than two (2) feet below that of the lowest finished floor of buildings.

g. For the ten- (10) year storm, street ponding shall be limited to one-half (1/2) of the roadway area and shall not exceed the capacity of the inlet or produce a flow depth of greater than 0.12 feet at the edge of the travel lane.

h. For roadway flooding conditions during the one hundred- (100) year storm, one travel lane in either direction shall remain open to emergency vehicles at all times. A travel lane will be considered to be open to emergency vehicles if the maximum depth of flow in the travel lane does not exceed 0.5 feet.

i. For parking lot flooding conditions during the one hundred- (100) year storm, the maximum depth of ponding shall not exceed 1.5 feet. Storage volumes resulting from ponding in street and parking lot areas may be used to meet the storage requirements of subsection 40.380.040(C)(3)(d)(2) of this section for the one hundred- (100) year storm.

j. Design of conveyance systems shall be in accordance with Chapter III-2 of the BMP Manual.

k. Design of bridge stormwater systems shall be in accordance with the Washington Department of Transportation Bridge Design Standards, 1991 Edition.

l. Stormwater easements shall be provided to the county for access and maintenance of all conveyance systems (including streams, if utilized) within the development site, which are to be maintained by the county. The minimum widths of easements shall be as follows, although the responsible official may require increased widths when necessary to insure adequate area for equipment access and maintenance:
   (1) Pipes with an inside diameter less than or equal to thirty-six (36) inches: twenty (20) feet;
   (2) Pipes with an inside diameter greater than thirty-six (36) inches: twenty (20) feet plus the pipe's inside diameter;
   (3) Pipes shall be located with their center line no closer than one-quarter (1/4) the easement width from an abutting property line;
   (4) Channels: top width of channel plus fifteen (15) feet on one side.

m. No buildings or other structures that prevent access are permitted within easements. Fences crossing easements shall provide gates of sufficient width over the easement for access by maintenance vehicles.

5. Discharge to Large Water Bodies. Development activities and redevelopment meeting all the following criteria are exempt from the quantity control requirements of Section 40.380.040(C)(3)(d):
   a. The runoff from the development activity or redevelopment directly enters one of the following water bodies through a pipe or other approved discharge structure:
      (1) Columbia River,
      (2) Lacamas and Round Lakes,
      (3) North Fork Lewis River,
      (4) Vancouver Lake,
      (5) Lake River;
   b. Runoff is treated in accordance with the requirements of Section 40.380.040;

c. The discharge structure is designed to avoid erosion during all storms up to the one hundred- (100) year storm;
d. If an existing discharge structure is used:
(1) The structure must meet the requirements of subsection (C)(5)(c); and
(2) The discharge structure and conveyance system leading to the discharge must have adequate capacity to meet the requirements of this chapter.

D. Location of stormwater facilities.
1. Treatment, runoff control and recharge facilities shall be located prior to the point of discharge into a stream, lake or fish-bearing water or prior to discharge to groundwater.
2. Locations of stormwater facilities in relation to wetlands are specified in Chapter 40.450.
3. Stormwater facilities, other than closed conveyance systems, shall be located at least one hundred (100) feet from existing and proposed on-site sewage system drainfields.
4. Infiltration systems used for stormwater disposal shall be located at least one hundred (100) feet from domestic water supply wells.
5. Swales and other stormwater treatment facilities using biofiltration shall be located outside easements and corridors used by phone, electric, water, natural gas, and other utilities unless the utilities are installed prior to construction of the biofiltration system.
6. Sites used for stormwater treatment and runoff control facilities shall be owned by the applicant, county or state and:
a. If the county or state owns the site, a letter from the responsible agency allowing use of the site for stormwater control shall be submitted with the preliminary stormwater plan; or
b. If the county or state does not own the site, the ownership shall be included for consideration with the land use application for the development activity.
7. Stormwater treatment and control facilities in urban residential subdivisions and short plats shall be located on separate tracts which are recommended, but not required, to meet minimum zoning lot size requirements. The plat or other dedication instrument shall indicate tract disposition in the event of county abandonment or vacation.

E. Protection of infiltration systems from erosion. Stormwater infiltration systems shall be isolated and protected from sedimentation due to erosion during the construction phase of a development activity or drainage project. Furthermore, use of infiltration systems shall be minimized until the erodible parts of a site are stabilized with adequate vegetation.

F. Fencing of stormwater facilities.
1. Stormwater treatment and runoff control facilities located in or adjoining residential areas shall be fenced unless these facilities are constructed as part of a development amenity such as a park or the responsible official waives the fencing requirement due to special circumstances.
2. Stormwater treatment and runoff control facilities, other than those described in Section 40.380.040(F), shall be fenced if they pose safety risks to the public.
3. The size and type of fence shall be determined by the responsible official.

G. Side slopes of stormwater facilities.
1. For maintenance, safety, and stability reasons, side slopes of stormwater facilities normally shall be no steeper than three to one (3:1) within the area of submergence.
2. For facilities to be maintained by the county, vertical slopes are allowed if all the following conditions are met:
a. No more than seventy-five percent (75%) of the perimeter of the stormwater facility shall have vertical sides;
b. Vertical sides more than three (3) feet high shall be fenced;
c. Access for maintenance of facilities satisfactory to the responsible official shall be provided; and
d. Side slopes in a biofiltration treatment area shall be no steeper than three to one (3:1).

3. For facilities that will not be maintained by the county, slopes steeper than three to one (3:1) are allowed if all the following conditions are met:
    a. Side slopes in a biofiltration treatment area shall be no steeper than three to one (3:1);
    b. Adequate long-term erosion control is provided;
    c. No more than seventy-five percent (75%) of the perimeter of the stormwater facility shall have vertical sides;
    d. Vertical sides more than three (3) feet high shall be fenced; and
    e. The maintenance and operations manual for the facility shall demonstrate that the facility can be maintained.
4. Side slopes steeper than two to one (2:1) may be allowed by the responsible official for specialized development activity, such as streambank reconstruction, where all the following conditions are met:
    a. Side slopes do not need to be mowed; and
    b. Adequate long-term erosion control and slope stability is provided.

H. Maintenance and ownership.
1. County Ownership of Stormwater Facilities--When Required. County ownership of stormwater facilities is required for all such facilities that are to be located within a public right-of-way or for which arrangements for private long-term maintenance which are acceptable to the responsible official have not been made.
2. Acceptance of Ownership by the county.
    a. Provisional Acceptance. Stormwater facilities, which are to be owned by the county, will be provisionally accepted for ownership upon the approval of the record drawings and approval of an inspection of the facilities by the county. Provisional acceptance of the facilities shall not relieve the applicant from any obligation to undertake any remedial measures to correct deficiencies in the design, construction, maintenance or operation of the facilities.
    b. Final Acceptance of Ownership by the county. No sooner than eighteen (18) months following the provisional acceptance of the facilities, the applicant shall notify the responsible official that the facilities are eligible for final acceptance of ownership by the county. Prior to their final acceptance for ownership, the facilities shall be inspected to determine that they are in satisfactory condition. The responsible official may require the applicant to conduct tests of the facilities to reasonably demonstrate that they are operating as designed and to the county standards for quality and quantity control as a condition of final acceptance. Upon approval of the facilities by the responsible official and all necessary ownerships and easements entitling the county to properly access and maintain the facilities have been conveyed to the county and recorded with the County Auditor, they will be finally accepted for ownership by the county.
3. Maintenance of Stormwater Facilities.
    a. County Owned Facilities.
        (1) Initial Maintenance and Repair. For a period of at least two (2) years following the provisional acceptance of stormwater facilities or thereafter until the facilities are finally accepted by the county, the developer constructing the facilities shall maintain, repair, redesign, reconstruct the facilities to ensure that they operate as designed and to the county standards for quality and quantity control. This obligation shall extend to remedying any damage caused to the facilities by builders or other third parties during the initial maintenance period. The required maintenance shall be performed according to county's Stormwater Facilities Maintenance Manual as adopted by Chapter 13.26A.
        (2) During the initial maintenance period, remedial work to correct deficiencies shall be the responsibility of the developer and shall be completed prior to final acceptance. Required remedial work to correct maintenance and construction deficiencies shall be completed by the applicant prior to final acceptance.
        (3) Long-Term Maintenance. Following their final acceptance for county ownership, the county shall maintain stormwater facilities.
    b. Privately Owned Facilities.

(1) Responsibility for Maintenance. For stormwater facilities for which the county will not provide long-term maintenance, the developer shall make arrangements with the existing or future (as appropriate) occupants or owners of the subject property for assumption of maintenance to the county's Stormwater Facilities Maintenance Manual as adopted by Chapter 13.26A. The responsible official prior to county approval of the final stormwater plan shall approve such arrangements. Final plats shall include a note specifying the party(s) responsible for long-term maintenance of stormwater facilities.
The county may inspect privately maintained facilities for compliance with the requirements of this chapter. If the parties responsible for long-term maintenance fail to maintain their facilities to acceptable standards, the county shall issue a written notice specifying required actions to be taken in order to bring the facilities into compliance. If these actions are not performed in a timely manner, the county shall take enforcement action and recover from parties responsible for the maintenance in accordance with Section 32.04.060.

(2) Easements Required. Easements or a covenant acceptable to the responsible official shall be provided to the county for purposes of inspection of privately maintained facilities. The minimum dimensions of easements for stormwater facilities are as follows;

(3) Pond design and easements shall allow access to all areas within the pond and drainage structures by standard maintenance equipment vehicles;

(4) Widths of easements for conveyance facilities shall be as detailed in Sections 40.380.040(C)(3).

I. Recovering costs of stormwater facilities.
1. The following costs associated with stormwater facilities may be recoverable through latecomers agreements (RCW 35.91.010):
   a. Over-sizing on-site facilities above their existing capacity or the capacity required for the proposed development;
   b. A proportionate share of the total cost of off-site facilities.
2. If a stormwater utility exists, the costs for building or over-sizing a stormwater facility may be eligible as a credit against applicable system development charges.

J. Bonds and insurance.
1. Performance Security. In lieu of completing required stormwater facilities within a preliminary plat prior to recording, the applicant shall post a performance bond or other security acceptable to the responsible official in the amount of one hundred fifty percent (150%) of the estimated cost (prepared by the project engineer) of completing construction per the approved stormwater plan. After determination by the responsible official that all facilities are constructed in compliance with the approved plan, are performing their intended functions in a satisfactory manner, and that the maintenance bonding requirements of Section 40.380.040(H) are met, the performance bond or security shall be released. No building permits shall be issued until the stormwater facilities are completed and provisionally accepted.
2. Maintenance Security. In cases identified in Section 40.380.040(H)(2), a maintenance bond or other security acceptable to the responsible official shall be posted and maintained throughout the two (2) year initial maintenance period for a stormwater facility.

K. Basin plans.
1. Basin plans are strategies for a watershed designed to protect and enhance surface and groundwater within a watershed.
2. Where conflicts occur, the policies and standards in an adopted basin plan shall supersede the other requirements of this section, which shall be equal to or exceed the requirements of this section.
3. To be valid, basin plans must be stamped by a registered professional engineer, adopted by the board, meet the requirements of RCW 36.94, and incorporated into this section.

L. Regional and sub-regional facilities.

1. If regional or subregional facilities are used to meet some or all of the standard requirements of this article, the following conditions shall be met:
    a. Stormwater runoff shall be transported from a development site to a regional/subregional facility through a pipe or man-made open channel conveyance system.
    b. If the regional/subregional facility does not yet exist, interim quantity control and treatment methods shall be used to meet the standard requirements of this article. All interim methods shall be reviewed and shall require written approval by the responsible official.
    c. The facility must have sufficient capacity to provide the treatment and quantity control specified in this section.
    d. A written commitment from the owner of the facility, or the responsible official in the case of county-owned facilities, shall be provided that allows use of the facility by the applicant.
    e. The county encourages the use of regional and subregional stormwater facilities. Review of designs of these types of facilities shall be expedited by the county and receive priority review.
2. Where a stormwater utility exists, a system development charge can be assessed for use of a regional/sub-regional facility.

M. Record drawings.
1. Record drawings which accurately represent the development site as constructed shall be provided to Clark County prior to: the issuance of building permits for single-family/duplex residential subdivisions; the issuance of occupancy permits for development activities subject to site plan review; and within sixty (60) days following completion of construction of other development activities.
2. The record drawings shall include corrected engineering plans for the stormwater system, showing constructed dimensions and elevations. In addition, revisions to the final stormwater plan shall be submitted with the record drawings where changes which take place during construction significantly alter the calculations and assumptions contained in the plan.
3. All plans submitted shall be reproducible and on Mylar.
4. The record drawing submittal shall be stamped, signed and dated by a licensed professional engineer, registered in the state of Washington.
5. Record drawings are requested to be submitted on computer disk in a format determined by the county, upon notice to do so.

N. Exceptions for single-family/duplex residential subdivisions:
1. The responsible official may approve the issuance of building permits for up to fifty percent (50%) of the lots after the stormwater and road improvements are substantially complete. Substantial completion is defined as:
    a. Following inspection, stormwater facilities are operational and constructed to county standards;
    b. Streets are constructed and at least one lift of asphalt is installed when paving is required;
2. The development activity is in full compliance with this chapter.
3. Building permits for "model homes" may be approved subject to the following conditions:
    a. One model home per subdivision, unless there are more than twenty (20) lots, in which case one additional model home per each additional twenty (20) lots or fraction thereof;
    b. The responsible official must approve the applicant's selection of the lot(s) for the model home(s);
    c. Emergency access and fire hydrants, where required, must be provided for model homes.

## 40.380.050 EROSION CONTROL

A. Small parcel development requirements.
1. Construction Access. Construction vehicle access shall be limited, wherever possible, to only one (1) route. Access points shall be stabilized with two- (2) to four- (4) inch diameter gravel to minimize tracking of

sediment (mud) onto public roads. Vehicles not performing a construction activity shall not be permitted off-street. Worker personal vehicles shall be parked on adjacent streets or other approved areas.

2. Stabilization of Denuded Areas. All exposed and un-worked soils shall be stabilized by suitable application of BMPs, including but not limited to sod or other vegetation, plastic covering, mulching, or application of ground base on areas to be paved. All BMPs shall be selected, designed, and maintained in accordance with the BMP manual. From October 1st through April 30th, no soils shall remain exposed for more than two (2) days. From May 1st through September 30th, no soils shall remain exposed for more for seven (7) days. Construction materials such as lumber shall be delivered and stored on designated locations that are stabilized and protected from erosion. All sidewalk areas shall be pre-graded and stabilized for use as sediment traps.
3. Protection of Water Bodies and Adjacent Properties. Water bodies and adjacent properties shall be protected from sediment deposition by appropriate use of vegetative buffer strips, sediment barriers or filters, dikes, mulching, or by a combination of these measures and other appropriate BMPs. Each owner, builder, or permit holder shall install and maintain inlet protection on storm drain inlets impacted from construction activity on their site.
4. Maintenance. All erosion and sediment control BMPs shall be inspected and maintained and repaired as needed to ensure continued performance of their intended function. Maintenance and repair shall be conducted in accordance with the BMP manual or approved site plans. A maintenance log for private facilities shall be provided and kept as a permanent record. The maintenance log shall be in a designated on-site location. Uncompleted construction sites shall be inspected at least once a week and after each rainfall and shall be repaired if needed. An inspection log shall be maintained from the beginning of construction until the completion of the warranty period and final project inspection.

B. Large parcel development requirements.

1. Construction Access Route. Construction vehicle access shall be limited to specific access points. Access points shall include a temporary sedimentation pond or other approved BMP to contain or treat wash water from construction vehicles. Use of more than one (1) access point shall require approval of the responsible official. Access points shall be stabilized with two (2) inch diameter gravel to minimize the tracking of sediment (mud) onto public roads. Evidence of tracking of material from a construction site may require construction activities to cease until corrections are made.
2. Sediment Removal from Roadways. If sediment is transported onto a road surface, the roads shall be cleaned thoroughly at the end of the work day, or more often if necessary. Significant soil deposits shall be removed from roads by shoveling or sweeping. Street washing, which must be approved by the responsible official, shall be allowed only after sediment is removed in this manner. Prior to washing, all inlets and down-stream facilities must be protected.
3. Delineate Clearing and Easement Limits. At the site, mark clearing limits and/or any easements, setbacks, sensitive/critical areas and their buffers, trees and drainage courses.
4. Stabilization and Sediment Trapping. All exposed and unworked soils shall be stabilized by suitable application of BMPs. From October 1st to April 30th, no soils shall remain unstabilized for more than two (2) days. From May 1st to September 30th, no soils shall remain unstabilized for more than seven (7) days. Prior to leaving the site, stormwater runoff shall pass through a sediment pond or sediment trap, or other appropriate BMPs.
5. Protection of Water Bodies and Adjacent Properties. Water bodies and properties adjacent to the site shall be protected from sediment deposition by appropriate use of BMPs. Prior to leaving sites larger than one (1) acre, stormwater runoff shall pass through a sediment pond, sediment trap, or other appropriate BMP designed in accordance with the BMP manual. Sediment traps alone are not adequate on sites greater than three (3) acres. BMPs shall be selected, designed and maintained in accordance with the BMP manual.
6. Timing of Sediment Trapping Measures. Sediment ponds and traps, perimeter dikes, sediment barriers, and other BMPs intended to trap sediment on-site shall be constructed as a first step in grading. These BMPs shall be stabilized and functional before land-disturbing activities take place. Earthen structures such as dams, dikes, and diversions shall be seeded and mulched according to the timing indicated in subsection D of Section 13.29.410.

7. Infiltration System Protection. Permanent infiltration systems shall be isolated and protected from sedimentation by sediment traps, sacrificial systems, duplicate systems, or redundant systems.
8. Controlling Off-Site Erosion. Properties and waterways downstream from development sites shall be protected from erosion due to increases in the volume, velocity, and peak flow rate of stormwater runoff from the project site. Acceptable BMPs include temporary or permanent detention ponds and temporary infiltration BMPs limiting the discharge from a two- (2) year storm to one-half (1/2) the pre-development two- (2) year storm peak runoff rate.
9. Stabilization of Temporary Conveyance Channels and Outlets. All temporary on-site conveyance channels shall be designed, constructed and stabilized to prevent erosion from the expected velocity of flow from a two- (2) year, twenty-four (24) hour frequency storm for the developed condition. Stabilization adequate to prevent erosion of outlets, adjacent streambanks, slopes and downstream reaches shall be provided at the outlets of all conveyance systems. BMPs shall be selected, designed and maintained in accordance with the BMP manual. Outlet protection shall also include energy dissipation structures or devices that retard peak flows to non-erosive conditions.
10. Storm Drain Inlet Protection. All storm drain inlets shall be protected so that stormwater runoff shall not enter the conveyance system without first being filtered or otherwise treated to remove sediment. BMPs shall be selected, designed and maintained in accordance with the BMP manual. Other BMPs may be utilized, provided they have prior approval by the responsible official.
11. Maintenance. All erosion and sediment control BMPs shall be inspected, maintained and repaired as needed to ensure continued performance of their intended function. Maintenance and repair shall be conducted in accordance with the BMP manual or approved site plan. A maintenance log for private facilities shall be provided and kept as a permanent record. The maintenance log shall be in a designated on-site location. Uncompleted construction sites shall be inspected at least once a week and after each rainfall and shall be repaired if needed. An inspection log shall be maintained from the beginning of construction until the completion of the warranty period and final project inspection.
12. Underground Utility Construction. The construction of underground utility lines shall be subject to the following criteria:
    a. Where feasible, no more than five hundred (500) feet of trench shall be opened at one time.
    b. Excavated material shall be placed to minimize runoff into the trench and adjacent roadways consistent with safety and space considerations;
    c. Trench dewatering devices shall discharge into a sediment trap or sediment pond;
    d. BMPs shall be used to control erosion during and after construction;
    e. BMPs damaged during construction shall be replaced or repaired; and
    f. An erosion control plan specifically related to underground work shall be submitted and approved prior to beginning work.
13. Construction Site Dewatering. Dewatering devices shall discharge into a sediment trap or sediment pond.
14. Control of Pollutants Other Than Sediment on Construction Sites. All pollutants other than sediment that occur on-site during development shall be handled and disposed of in a manner that does not cause contamination of stormwater.
15. Removal of Temporary BMPs. All temporary erosion and sediment control BMPs shall be removed within thirty (30) days after final site stabilization is achieved or after the temporary BMPs are no longer needed. Trapped sediment shall be removed or stabilized on-site. Disturbed soil areas resulting from removal shall be permanently stabilized.
16. Cut and Fill Slopes. Cut and fill slopes shall be designed and constructed in a manner that will minimize erosion. In addition, slopes shall be stabilized in accordance with subsection (B)(4) of this section.
17. If the BMPs approved and applied to a site are insufficient to prevent sediment from reaching water bodies, adjacent properties, or public rights-of-way, additional BMPs shall be implemented immediately by the property owner, person undertaking the activity, or permit holder.

C. Signage. Erosion control signage approved by the responsible official shall be installed at each point of entry for any subdivision or short plat prior to issuance of provisional acceptance by the county. Signs may be purchased from the county. Removal of signage shall occur no sooner than the latter of: certificates of

occupancy have been issued for seventy percent (70%) of the lots; or there being less than ten (10) unoccupied lots remaining within the development or as determined by the responsible official.

D. Contractor certification. Effective January 1, 2001, all development activities performed by licensed contractors shall be supervised by an individual who shall have successfully completed formal training in erosion and sediment control during construction by a recognized organization acceptable to the responsible official. A certification of successful completion of such training shall be submitted at the pre-construction conference. This shall not apply to residential home owners constructing their own development activity.

E. Financial liability. The owner constructing the facility shall maintain a liability policy in the amount of five hundred thousand dollars ($500,000) which shall name Clark County, Washington as an additional insured, and which shall protect Clark County from any liability up to that amount for any accident, negligence, failure of facilities, or any other liability whatsoever, relating to the construction or maintenance of the facilities. The liability policy shall be maintained by the owner of the facilities commencing at the start of construction and continuing until final acceptance. The responsible official may approve other forms of surety.

## 40.380.060 SUBMITTAL REQUIREMENTS FOR STORMWATER, EROSION CONTROL AND DEVELOPMENT PLANS

A. General.
   1. All applicants proposing development activities and redevelopment governed by this chapter shall submit the plans, studies, and information as provided herein.
   2. Signatures. All plans, studies, and reports shall be stamped, signed and dated by the professional civil engineer(s), registered in the state of Washington, and registered soil scientist, if appropriate, responsible for their preparation, and by the project engineer responsible for preparation of the preliminary stormwater plan.

B. Abbreviated preliminary stormwater plan submittals. An abbreviated preliminary stormwater plan is allowed for certain projects specified in Section 40.380.030. All maps shall contain a scale and north arrow. Insuring the accuracy of all the information is the applicant's responsibility. Abbreviated preliminary stormwater plan submittals shall include:
   1. Vicinity Maps. All vicinity maps shall clearly show the site of the development activity or drainage project.
   2. Site Location Map. Minimum USGS (one to twenty-four thousand (1:24,000) quadrangle topographic map showing natural and man-made drainage features adjacent to site including existing and proposed (if known) stormwater facilities.
   3. Other Maps. The following additional vicinity maps shall be required in the situations noted below:
      a. Floodplains. If a floodplain mapped by FEMA exists on or adjacent to the site;
      b. Shoreline Management Area. If the site contains or is adjacent to a stream or lake regulated under the Washington Shorelines Management Act.
   4. A Preliminary Development Plan Meeting the Requirements of Section 40.380.060(F): Additional Site and Vicinity Information.
      a. If wetlands exist on the site and will be impacted by the proposal, a wetland delineation report (Section 40.400.050(C)(4)) may be required.
      b. If unstable or complex soil conditions exist which may significantly impact the design of the stormwater facilities, the responsible official may require a preliminary soils report to be completed that addresses stormwater design considerations arising from soil conditions.
      c. The responsible official may require additional site or vicinity information if needed to determine the feasibility of the stormwater proposal.
   5. Preliminary Stormwater Design Report. A written narrative shall be required to accompany the preliminary stormwater plan. The narrative shall describe the methods for meeting the requirements of this chapter and include the following information:
      a. Listing of approximate volumes of runoff storage required;

b. Listing of tested percolation rates at sites to be used for infiltration, if required;
c. Listing of proposed BMPs which will meet the treatment requirements of this chapter and are appropriate for the site;
d. Description of the approximate size and location of stormwater facilities on the site;
e. Discussion of who will maintain the facility(s) after completion and proposed method of funding if the facility(s) will be privately maintained; and
f. Listing of additional permits (e.g., wetland, floodplain, and shoreline management permits) that may be required in connection with the stormwater facilities.

C. Preliminary stormwater plan submittals.
1. Purpose. The purpose of this plan is to determine whether a proposal can meet the requirements set forth in Chapter 40.380. The preliminary stormwater plan shall identify how stormwater runoff originating on the site or flowing through the site is presently controlled and how this will change due to the proposed development activity, redevelopment, or drainage project. If the site is within the region covered by a basin plan pursuant to this chapter, then the information needed in the preliminary plan is reduced. All maps shall contain a scale and north arrow.
2. Types of Development Activity and Redevelopment. A preliminary stormwater plan is required for all development activities not exempted by Section 40.380.020 and Section 40.380.030 and the following activities:
a. Short plats and
b. Subdivisions;
c. Site plan reviews;
d. Planned unit developments;
e. Conditional uses meeting the applicability requirements of Section 40.380.020; and
f. Master plan developments.
g. Timing.
h. A preliminary stormwater plan shall be submitted with the land use application.
(1) A land use application shall be considered "fully complete" from the standpoint of stormwater information when a preliminary stormwater plan meeting the submittal requirements of this section is provided.
(2) To insure adequate public review and avoid multiple reviews of preliminary plans by county staff, the preliminary stormwater plan shall not be significantly modified after public notice of the final SEPA determination without issuance of a new SEPA determination.
i. Contents. The preliminary stormwater plan submittal shall be prepared in the standardized format described below. The purpose of this standardized format is to promote a quick and efficient review of required information. The project engineer shall include a statement that all information required by this section is included in the preliminary stormwater plan and that the proposed stormwater facilities are feasible. All maps shall contain a scale and north arrow. Insuring the accuracy of all the information is the applicant's responsibility.
(1) Vicinity Maps. All vicinity maps shall clearly show the site of the development activity, redevelopment, or drainage project;
(2) Site Location Map. Minimum USGS (one to twenty-four thousand (1:24,000) quadrangle topographic map showing (and labeling where appropriate):
(a) Contributing drainage areas and acreage both on-site and off-site, and
(b) Natural and man-made drainage features adjacent to the site including existing and proposed (if known) stormwater facilities.
(3) Soils Map.
(a) The soils map shall show soils within the contributing area draining to the site and the site itself. Copies of Clark County soil survey maps may be used; however, if the maps do not appear to accurately represent the soils for a site, the applicant is responsible for verifying the actual soil types existing on a site,

(b) Where unstable or complex soil conditions exist which may significantly impact the design of stormwater facilities, the responsible official may require a preliminary soils report to be completed that addresses stormwater design considerations arising from soil conditions. The preliminary soils report shall be prepared by a registered professional engineer proficient in geo-technical investigation and engineering, or a registered soil scientist. The preliminary soils report shall include a soils map, developed using the criteria set in the USDA, SCS National Soils Handbook and USDA, SCS Title 430 Soil Survey Manual at a minimum scale of one to five thousand (1:5,000) (12.7 in/mi.);

(4) Other Maps. The following additional vicinity maps shall be required in the situations noted below:
   (a) Conveyance System. If a surface water discharge of stormwater is proposed from the site, a map showing the conveyance system downstream to a point where the stormwater enters a stream, wetland, or other natural water body shall be required,
   (b) Wellhead Protection. If the site lies within the ten- (10) year "zone of contribution" of a public water supply well, maps showing all the zones of contribution that overlap the site are required,
   (c) Floodplains. If a floodplain mapped by FEMA exists on or adjacent to the site, a map showing the floodplain is required,
   (d) Shoreline Management Area. If the site contains or is adjacent to a stream or lake regulated under the Washington Shorelines Management Act, a map showing the boundary of the shoreline management area in relation to the site is required;

(5) A preliminary development plan meeting the requirements of Section 40.380.060(F);

(6) Preliminary Stormwater Design Report. A written narrative shall be required to accompany the preliminary stormwater plan. The narrative shall describe the methods for meeting the requirements of this section and include the following information:
   (a) Description of on-site hydrologic soil groups and their suitability for the proposed design and verification of soil conditions through field reconnaissance (to the maximum extent practicable),
   (b) Identification of the approximate amount of new impervious surface contemplated for the proposal,
   (c) Identification of where runoff characteristics will be altered, e.g., where runoff curve numbers will be revised by the proposed development,
   (d) Discussion of how on-site conveyance system design will provide for ultimate build-out of the upstream area based on the maximum density achievable under the comprehensive plan, if applicable,
   (e) Listing of approximate volumes of runoff storage required,
   (f) Listing of tested percolation rates at sites to be used for infiltration, if required,
   (g) Listing of proposed BMPs which will meet the treatment requirements of this chapter and are appropriate for the site,
   (h) Description of the approximate size and location of stormwater facilities on the site,
   (i) For agricultural sites with drain tiles, a discussion of the impact of construction on the drain tiles and site drainage and the impact of the drainage tiles on proposed stormwater facilities,
   (j) Discussion of who will maintain the facility(s) after completion and the proposed method of funding for maintenance, if the facility(s) will be privately maintained, and
   (k) Listing of additional permits (e.g., wetland, floodplain, and shoreline management permits) that may be required in connection with the stormwater facilities.

j. Modification of Content Requirements. The responsible official may waive in writing some or all of the content requirements in the preliminary stormwater plan if:
   (1) The development activity or drainage project is included in an approved final stormwater plan which meets the requirements of this chapter; or
   (2) A basin plan exists that makes some of the information irrelevant.

The waiver of some or all of the preliminary stormwater control plan does not relieve the applicant of a final stormwater control plan.

k. Review and Approval. For proposals connected with a land use application requiring a public hearing, the preliminary stormwater plan shall be heard and decided in accordance with the procedures applicable to the land use application. All other preliminary stormwater plans shall be acted on by the responsible official within thirty (30) days following submittal of a preliminary stormwater plan meeting the submittal requirements of this section.

l. Appeals. Preliminary stormwater plan decisions may be appealed in conjunction with the associated land use application.

D. Final stormwater plan submittals.

1. Purpose. The final stormwater plan provides final engineering design and construction drawings for the stormwater aspects of a proposed development activity, redevelopment, or drainage project.
2. Timing. The final stormwater plan is required and must be approved by the responsible official prior to beginning construction related to a development activity, redevelopment, or drainage project.
3. Contents. The final stormwater plan shall include the following:
   a. An engineer's estimate of the cost for surveying and engineering to complete the record drawing(s) is required prior to site plan approval;
   b. An escrow, letter of credit, cashier's check, or other acceptable form of guarantee is required from the applicant or applicant's representative for one-hundred ten percent (110%) of the engineer's estimate identified in Section 40.380.060(D)(1) of this section. Bonds are not acceptable instruments;
   c. Any easements, covenants or agreements that are necessary to permit construction must be included;
   d. The approved preliminary stormwater plan with an explanation of any differences between the design concepts included in the preliminary stormwater plan and the final engineering plans. A final stormwater plan which differs from the approved preliminary stormwater plan in a manner that, in the opinion of the responsible official, raises material water quality or quantity control issues, shall, if subject to SEPA, require another SEPA determination, and a post-decision review in accordance with Section 18.600.110;
   e. Final engineering plans that provide sufficient detail to allow construction of the stormwater facilities. These plans shall be stamped, signed and dated by the engineer(s) registered in the state of Washington, responsible for hydrologic, hydraulic, geo-technical, structural and general civil engineering design and by the project engineer responsible for the preparation of the final stormwater plan. Additionally, the final engineering plan shall show all utilities to insure conflicts between proposed utility lines do not exist;
   f. The off-site analysis required under Section 40.380.040(B)(2);
   g. A final development plan meeting the requirements of Section 40.380.060(F); and
   h. A technical information report.
4. Technical Information Report (TIR). The TIR shall be a comprehensive report, supplemental to the final engineering plans, containing all technical information and analysis necessary to complete final water quality and quantity engineering plans based on sound engineering practices and appropriate geo-technical, hydrologic, hydraulic and water quality design. The TIR shall be stamped, signed and dated by the professional engineer(s), registered in the state of Washington, responsible for hydrologic, hydraulic, geo-technical, structural and general civil engineering design. The level of detail in the TIR is dependent on the complexity and size of the development activity. The TIR, which is part of the final stormwater plan, shall contain the following information:
   a. Table of Contents.
      (1) List section headings and their respective page numbers,
      (2) List of tables with page numbers,
      (3) List of figures with page numbers,
      (4) List of attachments, numbered,
      (5) List of references;

b. Site Location Map. The site location map (minimum USGS one to twenty-four thousand (1:24,000) quadrangle topographic map) shall be as required for the preliminary stormwater plan, updated to reflect additional data or revisions to concepts established in preliminary stormwater plan;
c. Soils Map. A soils map as required for the preliminary stormwater plan;
d. Section A--Project Overview.
    (1) Identify and discuss existing stormwater system functions,
    (2) Identify and discuss site parameters influencing stormwater system design,
    (3) Describe drainage to and from adjacent properties, and
    (4) Generally describe proposed site construction, size of improvements, and proposed methods of mitigating stormwater runoff quantity and quality impacts;
e. Section B--Approval Conditions Summary. List each preliminary approval condition related to stormwater control, wetlands, floodplains, and other water-related issues and explain how design addresses or conforms to each condition;
f. Section C--Quantity Control Analysis and Design.
    (1) Hydrologic analysis, existing and developed conditions.
        (a) Identify criteria used in completing analyses and their sources,
        (b) Identify and discuss any assumptions made in completing analysis,
        (c) Tabulate acreage; imperviousness; curve number; length and grade of overland, pipe and channel flow; and other hydrologic parameters used in completing analyses,
        (d) Complete detailed hydrologic analysis for existing and developed site conditions in accordance with the requirements of Section 40.380.030(B). Compute existing and developed peak flows and volumes for the design storms for all sub-basins. Refer to labeled points shown on the site location map and development plan,
        (e) Include and reference all hydrologic and hydraulic computations in the technical appendix, and
        (f) Include all maps, exhibits, graphics and references used to determine existing and developed site hydrology,
    (2) Quantity Control System Design.
        (a) Reference conceptual design proposed in the preliminary stormwater plan,
        (b) Identify revisions to conceptual design contained within the final engineering plans,
        (c) Identify and discuss geo-technical or pedological study or information used in completing analysis and design,
        (d) Identify criteria used in completing analyses and their sources,
        (e) Identify initial conditions including stream base flows, beginning water surface elevations, hydraulic or energy grade lines, initial groundwater elevation, beginning storage volumes, and other data or assumptions used to determine initial conditions in order to complete analyses, referencing sources of information,
        (f) Identify and discuss any assumptions used in completing analysis,
        (g) Complete detailed hydrologic/hydraulic analysis of all on-site stormwater control facilities impacted by the proposal, in accordance with the requirements of Section 40.380.040(C). Compute inflow and outflow hydrographs and peakflows and storage volumes. Reference conveyance and stormwater control facilities to labeled points shown on the development plan,
        (h) Tabulate existing and proposed peak flows and storage volumes,
        (i) Include and reference all hydrologic and hydraulic computations, equations, rating curves, stage/storage/discharge tables, graphs and any other aids necessary to clearly show methodology and results in the technical appendix,
        (j) Summarize results of quantity control system analyses and describe how the proposed design meets the requirements of this chapter, and
        (k) Include all maps, exhibits, graphics and references used to complete quantity control system analysis and design,
    (3) Quantity Control System Plan.

(a) Provide illustrative sketch of quantity control facility and its appurtenances,
(b) Show basic measurements necessary to confirm storage volumes,
(c) Show all orifice, weir and flow restrictor dimensions and elevations,
(d) Tabulate peak flow rates, storage volumes and ponding elevations for all design storms,
(e) Sketch shall correspond with final engineering plans. Alternatively, final site grading plan incorporating the above information may be included as an attachment to the final stormwater plan;

g. Section D--Conveyance Systems Analysis and Design.
(1) Reference conceptual drainage design proposed in the preliminary stormwater plan,
(2) Identify revisions to conceptual drainage design contained within the final stormwater plan,
(3) Identify criteria used in completing analyses and their sources,
(4) Identify and discuss initial conditions including stream base flows, beginning water surface elevations, hydraulic or energy grade lines, beginning storage elevations, and other data or assumptions used to determine initial conditions in order to complete analyses. Reference sources of information,
(5) Identify and discuss assumptions used in completing analyses,
(6) Complete detailed hydraulic analysis of all proposed collection and conveyance system elements and existing collection and conveyance elements influencing the design or impacted by the proposal, including outfall structures and outlet protection, in accordance with Section 40.380.040(C). Compute and tabulate design flows and velocities and conveyance element capacities for all conveyance elements within the development. Compute existing one hundred-(100) year floodplain elevations and lateral limits for all channels, and verify no net loss of conveyance or storage capacity from development. Reference conveyance system elements to labeled points shown on the site location map or development plan,
(7) Verify capacity of each conveyance system element to convey design flow and discharge at non-erosive velocities. Verify capacity of on-site conveyance system to convey design flows resulting from ultimate build-out of upstream areas,
(8) Include and reference all hydraulic computations, equations, pipe flow tables, flow profile computations, charts, nomographs, detail drawings and other tabular or graphic aids used to design and confirm performance of conveyance systems in the technical appendix,
(9) Summarize results of system analyses and describe how the proposed design meets the requirements of this chapter;

h. Section E--Water Quality Design.
(1) Reference conceptual water quality design proposed in the preliminary stormwater plan,
(2) Identify revisions to conceptual water quality design contained within the final stormwater plan,
(3) Identify geo-technical or soils study or other information used in completing analysis and design,
(4) Identify best management practices used in design and their sources,
(5) Identify and discuss initial conditions including groundwater elevations, beginning storage elevations, and other data or assumptions used to determine initial conditions in order to complete analyses. Reference sources of information,
(6) Identify and discuss assumptions used in completing analysis,
(7) Complete detailed analysis and design of all proposed water quality system elements in accordance with Section 40.380.040(B). Reference water quality system elements to labeled points shown on the site location map or development plan,
(8) Include and reference all computations, equations, charts, nomographs, detail drawings and other tabular or graphic aids used to design water quality system elements in the technical appendix;
(9) Summarize results of water quality design and describe how the proposed design meets the requirements of this chapter;

i. Section F--Soils Evaluation.
(1) Identify on-site soil types and their erosive potential and discuss their suitability for implementation of proposed best management practices (BMPs) and quantity control facilities,

(2) Identify seasonal high water table elevations in cases where this will impact the stormwater facilities,
(3) Identify and discuss soil parameters and design methods for use in hydrologic and hydraulic design of proposed facilities,
(4) Report findings of testing and analysis used to determine the infiltration rate;

j. Section G --Special Reports and Studies. Where specific site characteristics, such as steep slopes, wetlands and sites located in wellhead protection areas pose difficult drainage and water quality design problems, the responsible official may require additional information or the preparation of special reports and studies which further address the specific site characteristics, the potential for impacts associated with the development, and the measures which would be implemented to mitigate impacts. Special reports shall be prepared by professional persons with expertise in the particular area of analysis, who shall date, sign, stamp and otherwise certify the report. Subjects of special reports may include, but not be limited to, the following:
(1) Geo-technical/pedological,
(2) Wetlands,
(3) Floodplains and floodways,
(4) Groundwater,
(5) Structural design,
(6) Fluvial geomorphology (erosion and deposition);
(7) All special reports and studies shall be included in the technical appendix, or as an attachment to the TIR;

k. Section H—Other Permits. Construction of roads and stormwater facilities may require additional water-related permits from other agencies. These additional permits may contain requirements that impact design of the stormwater system. This section shall list the titles of all other required permits, the agencies requiring the permits, and identify the permit requirements, if known, that affect the final stormwater plan. Approved permits that are critical to the feasibility of the stormwater facility design shall be included in this section. Examples of other permits are as follows:
(1) Clark County wetland permit,
(2) On-site sewage disposal: Clark County Health Department or Washington Department of Health,
(3) Developer/local agency agreement: Washington Department of Transportation,
(4) Short-term water quality modification approval: Washington Department of Ecology,
(5) Hydraulic project approval: Washington Departments of Fisheries and Wildlife,
(6) Dam safety permit: Washington Department of Ecology,
(7) Section 10, 404, and 103 Permits: U.S. Army Corps of Engineers,
(8) Surface mining reclamation permits: Washington Department of Natural Resources,
(9) Clark County floodplain permit,
(10) Clark County shoreline management permit,
(11) Clark County habitat permit;

l. Section I--Groundwater Monitoring Program. Where required under Section 40.380.040(H), a groundwater monitoring program shall be included in the final stormwater plan. The groundwater monitoring program shall be prepared by a person with expertise in groundwater contamination investigation, prevention and monitoring, and shall clearly describe a comprehensive groundwater testing and evaluation program designed to ensure compliance with federal and state of Washington laws and the requirements of this chapter. Proposed groundwater monitoring programs will be reviewed by the responsible official on a site-specific basis;

m. Section J--Maintenance and Operations Manual. For each stormwater control or treatment facility that is to be privately maintained and for those which constitute an experimental system under Section 40.380.040(H) to be maintained by the county, the project engineer shall prepare maintenance and operations manual. The manual, which may be brief, shall be clearly written in an orderly and concise format that clearly describes the design and operation of the facility. The manual shall also provide an outline of required maintenance tasks with recommended frequencies at which each task should be

performed. Use of the maintenance procedures outlined in the BMP Manual for various BMPs is encouraged;

n. Section K--Technical Appendix. All technical information reports (TIR) shall contain a technical appendix, including all computations completed in the preparation of the TIR together with copies of referenced data, charts, graphs, nomographs, hydrographs, maps, exhibits, and all other information required to clearly describe the stormwater runoff quantity and quality design for the proposed development activity. The format of the technical appendix shall follow as closely as possible the section format of the TIR, and shall be adequately cross-referenced to ensure that the design may be easily followed, checked and verified. The technical appendix shall also contain all special reports and studies, other than those included as attachments to the TIR.

5. Modification of Content Requirements. The responsible official may waive, in writing, some of the content requirements in the final stormwater plan if:
   a. The development activity, redevelopment, or drainage project is included in an approved final stormwater plan which meets the requirements of this section and the applicant demonstrates to the satisfaction of the responsible official that the applicable provisions of the previously approved final stormwater plan will be met; or
   b. The responsible official determines, upon receipt of a letter of request from the applicant, that less information is required to accomplish the purposes of this chapter; or
   c. A basin plan exists that makes some of the information irrelevant.
6. Review and Approval.
   a. Final stormwater plans shall be reviewed in accordance with the Type I review process in accordance with Section 40.510.010.
   b. All final stormwater plans require approval by the responsible official. Approval is only for conformance with Clark County standards and does not relieve the engineer of record of responsibility for the design.
   c. Approval of final stormwater plans does not relieve the applicant from the obligation to comply with this chapter and does not prevent the county from recovering for defective work or violation of this chapter.

E. Erosion Control Plans
1. Small Parcel Developments.
   a. Any person or entity undertaking a small parcel development shall agree to implement a small parcel development erosion control plan, provided by the county, which shall address the small parcel development requirements in Section 40.380.050(A).
   b. Small parcel developments are not required to submit preliminary erosion control plans unless they are conducting land disturbing activities within an erosion hazard area.
   c. Applicants may find “A Builder's Guide to Erosion Prevention & Sediment Control”, published by Clark County Home Builders Association, a useful reference for implementation.
2. Large Parcel Developments. Any person or entity undertaking a large parcel development shall prepare and implement a large parcel development erosion control plan which shall address the large parcel development requirements in Section 40.380.050(B).
3. Erosion Control Plan.
   a. An erosion control plan shall be submitted and approved prior to any person undertaking any land disturbing activity subject to this section. The erosion control plan shall be stamped by an engineer licensed in the state of Washington and shall be submitted with the final stormwater plan. Any revised plan shall be a refinement of the prior approved final erosion control plan clearly showing any changes or revisions.
   b. Content. The erosion control plan shall include a description of the following:
      (1) The BMPs that will be utilized to achieve compliance with the requirements of this chapter;
      (2) The timing of installation of BMPs and installation techniques;
      (3) The phasing of construction activities;
      (4) Protection of project improvements from erosion and sedimentation;

(5) The construction of employee parking and equipment storage areas;
(6) The effect of weather on the project and temporary stoppages;
(7) An inspection log shall be provided to note any changes from the approved plan;
(8) The location, sizes, and other design features of the proposed BMPs to be applied to the site;
(9) A maintenance schedule for insuring the BMPs continue to function until the site is revegetated and stable; and
(10) A contingency plan discussing additional BMPs to be applied if proposed BMPs fail or are insufficient to control erosion;
(11) Provisions for final stabilization prior to completion;
(12) Grading. Any grading to occur in conjunction with a development activity or redevelopment shall, in addition to requirements of this chapter, be designed in accordance with and meet the requirements of Chapter 33 Excavation and Grading of the Uniform Building Code.

4. Submittals. Erosion control plans shall be submitted, approved and implemented for all large parcel development activities and for small parcel development conducting land disturbing activities within an erosion hazard area.

F. Development plans.

1. Preliminary development plan shall show the character of the existing site and proposed features, including but not limited to:
   a. Existing and proposed property boundaries, easements and rights-of-way;
   b. Existing and proposed contours with a two (2) foot maximum contour interval, unless the responsible official determines a lesser interval is sufficient to show drainage patterns. Grading shall conform to the requirements of Chapter 33 of the Uniform Building Code;
   c. Existing on-site water wells, known agricultural drain tiles, areas of potential slope instability, structures, utilities, and septic tanks and drainfields;
   d. Location of the one hundred- (100) year floodplain and floodways and shoreline management area limits on the site;
   e. Proposed impervious surfaces outside of single-family residential lots;
   f. Existing water resource features on and adjacent to the site including streams, wetlands, springs, sinks and stormwater facilities;
   g. Existing and proposed drainage flow routes and existing discharge points to and from the site;
   h. Approximate location and size of proposed stormwater facilities, including typical cross-sections of proposed facilities;
   i. If wetlands exist on the site and will be impacted by the proposal, a wetland delineation report (Section 40.400.050(C)(4)) shall be required;
   j. Water table elevations, flow directions (where available), and data on seasonal water table fluctuations with minimum and maximum water table elevations (where available) shall be required;
   k. For sloping sites, a conceptual grading plan verifying the constructibility of a stormwater facility shall be required;
   l. The responsible official may require additional site or vicinity information if needed to determine the feasibility of the stormwater proposal.
2. Final development plans shall be consistent with the preliminary stormwater plan. Final development plans may be combined with the final engineering plans. In addition to the information required of preliminary development plans, the following information is required:
   a. Delineate sub-basins and show sub-basin acreage used in hydraulic/hydrologic calculations both on-site and off-site that contribute surface runoff.
   b. Show directions and lengths of overland, pipe and channel flow;
   c. Indicated outfall points and overflow routes for the one hundred- (100) year storm; and
   d. Show storage volumes, pipe and weir invert elevations, and lengths of weir for stormwater control facilities.
   e. The director may require additional site or vicinity information if needed to determine the feasibility of the stormwater proposal.