D.7 SMALL SITE ESC

Smaller project sites have similar erosion and sediment control (ESC) needs. This section offers a simplified set of requirements for applying erosion and sediment controls to certain smaller project sites and guides the user through the preparation and submittal of a Small Site ESC Plan with the permit application.

D.7.1 INTRODUCTION TO SMALL SITE ESC

What is ESC and Why is it Required for My Site?

The basic erosion and sediment control requirement—that sediment shall be prevented to the maximum extent practicable from leaving the site—**applies to all projects in King County**. All projects, including those with small project sites, are required to use erosion and sediment control (ESC) measures. ESC measures prevent soil erosion during development of the site. The types of measures required for small sites are generally simple to construct and easy to maintain, and with few exceptions do not require engineering or formal design. Examples of such measures include phasing or minimizing clearing, terracing exposed slopes, routing water around exposed soils, and placing straw or other mulching materials and cover exposed soils.

ESC is required because soils eroded from the site are *always* deposited downstream in pipes, streams, or lakes. Soils deposited in a pipe or channel reduce its capacity to convey flows and can increase the likelihood of flooding. Soils in streams can also clog the gravels that salmon use for spawning. Nutrients associated with soils that reach lakes can upset the chemical balance of the lake, causing excessive growth of algae and decreasing recreational uses such as swimming, boating, and fishing.

Which Projects May Use Small Site Erosion and Sediment Control Requirements?

All proposed projects that disturb soil on less than 3 acres and add less than 2,000 square feet of new impervious surface may use the Small Site ESC requirements contained in this section. These projects must apply erosion and sediment control per KCC 16.62 even though they may not be subject to drainage review under the *Surface Water Design Manual*.

In addition, all proposed projects subject to Small Project Drainage Review as determined in Section 1.1.2.1 of the *Surface Water Design Manual*, and which disturb soil on less than 3 acres, may use the Small Site ESC requirements contained in this section. These same requirements are contained in Appendix C of the *Surface Water Design Manual*, which details the drainage requirements for small agricultural and single family residential building or subdivision projects subject to Small Project Drainage Review.

What Will I Be Required To Do?

It is the responsibility of both the applicant and the contractor to minimize erosion and the transport of sediment to the greatest extent possible. Erosion and sediment control is a two step process that (1) minimizes the amount of sediment mobilized, and (2) traps any mobilized sediment before it leaves the site.

Examples of erosion controls include use of mulches or other cover materials, marked/minimized clearing, and routing of water around exposed soils. Installation and maintenance of silt fencing is an example of sediment trapping. ESC techniques that are particularly suitable for small sites are described below (Section D.7.2).

D.7.2 SMALL SITE ESC REQUIREMENTS

The following measures will be required on small sites in order to minimize onsite erosion and prevent mobilized sediment from leaving the site:

1. Stabilized construction entrance
2. Mulching or other cover methods
3. Minimized clearing
4. Silt fencing or other perimeter protection
5. Winter (or wet season) stabilization
6. Final stabilization.

Typically, a combination of all of the above measures are required during construction, unless specific site conditions exist that make a particular measure unnecessary, as determined by DDES. Other measures may be allowed or required if these are inappropriate for the project or fail to contain sediment on the project site. A description of other measures that may be needed for successful ESC on some sites, and a more detailed description of those included here, can be found in Section D.3, "ESC Measures" (p. D-7).

The placement and type of proposed ESC measures are shown on a **small site ESC plan**. Required features of this plan are outlined in Section D.7.3, "Submittal Requirements" (p. D-85).

D.7.2.1 STABILIZED CONSTRUCTION ENTRANCE

Construction entrances are stabilized to reduce the amount of sediment transported onto paved roads by motor vehicles or runoff by constructing a stabilized pad of quarry spalls at entrances to construction sites. Construction entrances shall be stabilized wherever traffic will be leaving a construction site and traveling on paved roads or other paved areas within 1,000 feet of the site.

See Section D.3.4.1 (p. D-39) for design and installation specifications and maintenance standards.

D.7.2.2 MULCHING OR OTHER COVER MEASURES

The cover measures described below are applicable to small sites.

Mulching

The purpose of mulching soils is to provide immediate temporary protection from erosion. Mulch also enhances plant establishment by conserving moisture, holding fertilizer, seed, and topsoil in place, and moderating soil temperatures. There is an enormous variety of mulches that may be used. Only the most common types are discussed in this section.

See Section D.3.2.2 (p. D-13) for conditions of use, design and installation specifications, and maintenance standards.

Nets and Blankets

Erosion control nets and blankets are intended to prevent erosion and hold seed and mulch in place on steep slopes and in channels so that vegetation can become well established. In addition, some nets and blankets can be used to permanently reinforce turf to protect drainage ways during high flows. Nets are strands of material woven into an open, but high-tensile strength net (for example, jute matting). Blankets are strands of material that are not tightly woven, but instead form a layer of interlocking fibers, typically held together by a biodegradable or photodegradable netting (for example, excelsior or straw blankets). They generally have lower tensile strength than nets, but cover the ground more completely. Coir (coconut fiber) fabric comes as both nets and blankets.

See Section D.3.2.3 (p. D-15) for conditions of use, design and installation specifications, and maintenance standards.

Plastic Covering

Plastic covering provides immediate, short-term erosion protection to slopes and disturbed areas.

See Section D.3.2.4 (p. D-17) for conditions of use, design and installation specifications, and maintenance standards.

D.7.2.3 MARK CLEARING LIMITS / MINIMIZE CLEARING

Minimizing clearing is the most effective method of erosion control. Undisturbed vegetation intercepts and slows rainwater. Plant roots hold soil in place, and dead vegetation on the ground acts as a mulch. Clearing limits shall be marked and clearing minimized on any site where significant areas of undisturbed vegetation will be retained.

See Section D.3.1 (p. D-8) for design and installation specifications and maintenance standards.

D.7.2.4 SILT FENCING AND OTHER PERIMETER PROTECTION

Perimeter protection to filter sediment from sheetwash shall be located downslope of all disturbed areas and shall be installed prior to upslope grading. The following perimeter protection measures are applicable to small sites.

Silt Fence

Use of a silt fence reduces the transport of coarse sediment from a construction site by providing a temporary physical barrier to sediment and reducing the runoff velocities of overland flow. Silt fence may be used downslope of all disturbed areas.

See Section D.3.3.1 (p. D-30) for design and installation specifications and maintenance standards.

Vegetated Strip

Vegetated strips reduce the transport of coarse sediment from a construction site by providing a temporary physical barrier to sediment and reducing the runoff velocities of overland flow. Vegetated strips may be used downslope of all disturbed areas.

See Section D.3.3.3 (p. D-34) for design and installation specifications and maintenance standards.

Triangular Silt Dike (Geotextile Encased Check Dam)

Triangular silt dikes (TSDs) may be used as check dams, for perimeter protection, for temporary soil stockpile protection, for drop inlet protection, or as a temporary interceptor dike. Silt dikes, if attached to impervious surfaces with tack or other adhesive agent may also be used as temporary wheel wash areas, or concrete washout collection areas.

See Section D.3.3.4 (p. D-34) for conditions of use, design and installation specifications, and maintenance standards.

D.7.2.5 WINTER STABILIZATION

Purpose

In order to minimize sediment-laden runoff, as much of the bare and disturbed portions of the site as possible should be covered during any period of precipitation. Once sediment is mobilized, it is much more difficult to effectively control.

Application

All sites require winter stabilization between October 1 and April 30 (the wet season).

Design Specifications

During the above time frame, slopes and stockpiles 3H:1V or steeper and with more than 10 feet of vertical rise shall be covered if they are to remain unworked for more than 12 hours. Other disturbed areas shall be covered or mulched according to D.3.2.2 (p. D-13) if they are to remain unworked for more than two days. Cover material sufficient to cover all disturbed areas shall be stockpiled on site at the beginning of the wet season. Areas that are to be left unworked during the winter shall be seeded prior to September 23.

Maintenance

The site should be inspected weekly and immediately before, during, and after storms. Cover and other erosion control measures shall be repaired and enhanced as necessary to prevent or minimize sediment runoff and transport.

D.7.2.6 FINAL STABILIZATION

Purpose

Final stabilization minimizes sediment-laden runoff from the site after construction has been completed.

Application

All sites require final stabilization prior to final construction approval.

Design Specifications

Prior to final construction approval, the site shall be stabilized to prevent sediment-laden water from leaving the site after project completion. All disturbed areas of the site shall be vegetated or otherwise permanently stabilized. At a minimum, disturbed areas must be seeded and mulched to ensure that sufficient cover will develop shortly after final approval. Mulch without seeding is adequate for small areas to be landscaped before October 1.

All permanent surface water facilities (including catch basins, manholes, pipes, ditches, channels, flow control facilities, and water quality facilities) impacted by sedimentation during construction must be cleaned.

Maintenance

Permanent erosion control is the responsibility of the owner. The site must be kept stabilized using landscaping, mulch, or other measures to prevent sediment-laden water from leaving the site and to prevent sediment from being transported onto adjacent properties and roads.

D.7.3 SUBMITTAL REQUIREMENTS

A *Small Site ESC Plan* must be submitted for all projects that are eligible to use the Small Site ESC requirements in this section. For projects in Small Project Drainage Review that disturb soil on less than 3 acres, this plan is part of the Small Project Drainage Plan described in the *Small Project Drainage Requirements* (Appendix C of the *Surface Water Design Manual*). For other projects, including those that may not be subject to drainage review, this plan would be submitted as directed by DDES. Directions for preparing a Small Site ESC Plan are provided below, and a sample plan is presented in Section D.7.3.3 (p. D-86).

D.7.3.1 SMALL SITE ESC PLAN MAP

The Small Site ESC Plan includes information that is routinely collected for a **single family residence site plan or a short plat plot plan** already required to be submitted with a permit application. One copy of the site plan or plot plan shall be used to show how ESC measures are to be applied to the site to comply with the Small Site ESC requirements. The approximate location and size of clearing limits, rock construction entrance, flow paths, silt fences, etc., should be indicated on the Small Site ESC Plan. Any plan must contain at a minimum the features listed in Section D.7.3.2.

Single family residential projects that qualify for Small Site ESC requirements should use the Residential Site Plan (see DDES Bulletin No. 9, "Obtaining a Residential Building Permit") as the base map for the ESC plan.

Proposed short plats that qualify for Small Project Drainage Review should use the Small Project Drainage Plan (see *Small Project Drainage Requirements*, detached Appendix C of the *Surface Water Design Manual*) as a base plan for the ESC plan. All projects subject to Small Project Drainage Review are required to submit these plans and a drainage assessment. If engineering plans are required for a short plat application, they may be used as a base plan for Small Site ESC plans. How the ESC measures are to be applied on the site are added directly to the base map. For more complicated sites, an erosion control professional should be readily able to add Small Site ESC BMPs to the base map with minimal additional effort or expense.

The ESC plans for short plats usually apply only to the site development, since siting of homes on lots created by short plats is done after the short plat is approved (when the home applies for a residential building permit). It is the responsibility of the applicant for a proposed single family residence to show in detail how ESC requirements are met. The applicant is also responsible for Single family residential development is required to comply with the Stormwater Pollution Prevention Manual and KCC 9.12.

D.7.3.2 FEATURES REQUIRED ON SMALL SITE ESC PLANS

The Small Site ESC Plan should be drawn on 8-1/2" x 11", 8-1/2" x 14", or 11" x 17" paper (see the sample plan in Figure D.7.3.A, p. D-88), and must include the following information.

Identification

1. Name, address, and phone number of the applicant
2. Scale—use a scale that clearly illustrates drainage features and flow controls (1"=20' is standard engineering scale; minimum acceptable scale is 1"=50')
3. Parcel number
4. North arrow
5. Dimension of all property lines, easements, and building setback lines
6. Street names and existing or proposed property address

7. Section, township, and range of proposal.

Topography

1. Corner elevations
2. Benchmark (a permanent mark indicating elevation and serving as a reference in the topographic survey)
3. Datum (assumed datum is acceptable in many cases, i.e., fire hydrant base = 100'; datum for projects in or near FEMA floodplains should be NGVD 1929)
4. If over 15% slope: 5-foot contours, top of slope, toe of slope, and any erosion or landslide areas.

Proposed ESC

1. Delineation of proposed clearing limits
2. Type and location of erosion control facilities
3. Location of any significant offsite drainage features within 200 feet of the discharge point(s) for the lot, including streams, lakes, roadside ditches.

Topography/Drainage Features

1. Outline of any stream, wetland, lake, closed depression, or other water feature (including any required buffer width)
2. Location of all steep slopes, landslide hazard areas, and coal mine hazard areas (including buffers)
3. Location of all existing and proposed drainage easements, ditches, swales, pipes, etc.
4. Location of all critical areas as shown on any recorded critical areas notice on title.

D.7.3.3 SAMPLE SMALL SITE ESC PLAN

All sites are required to control erosion and contain sediment. The planning and use of ESC measures will be illustrated for a single family residence. Although the specifics of any lot will differ from those shown here, the process will be similar. The first step in the process is to determine whether the site is eligible to use the Small Site ESC requirements. This evaluation and the following materials are usually included in the drainage assessment that accompanies the Small Site ESC Plan.

The proposed house is to be placed on an existing 1.69-acre lot (see Figure D.7.3.A). Impervious surfaces are the roof, a driveway, and a parking area. The total proposed impervious surface is 6,950 square feet as determined from the residential site plan layout of residence and driveway (the site plan provides the base map for the Small Site ESC Plan). The amount exceeds 2,000 square feet but falls below the 10,000-square-foot limit for Small Project Drainage Review. Therefore, a Small Site ESC Plan is applicable.

The proposal is not in a basin plan area or critical drainage area that might contain clearing limits. However, a portion of a wetland and an erosion hazard area have been identified on the site, and their approximate locations are shown in Figure D.7.3.A. While neither the wetland and its buffer, nor the erosion hazard area would be disturbed during construction, the locations of these critical areas must be verified.

Approximately the southern 2/3 of the site will be cleared. Trees and other native vegetation will be left intact along the northern edge, near the street. Buffers will be maintained around the wetland and erosion hazard areas, respectively. The site slopes towards the street.

In order to prevent erosion and to encourage sedimentation, the following **BMPs** are used:

1. **Clearing will be minimized** to the extent possible, and **clearing limits will be marked** by fencing or other means on the ground.

2. Water will be **routed** around the erosion hazard area and around the steep section of the driveway by constructing an interceptor dike or ditch that will intersect and direct water away to the east of the site.
3. Water will be **filtered** before it reaches the wetland. Silt fencing or other perimeter protection will be placed along slope contours at the limits of clearing in the vicinity of both the wetland and the erosion hazard area.
4. A rocked construction entrance will be placed at the end of the driveway.
5. **Mulch** will be spread over all cleared areas of the site when they are not being worked. Mulch will consist of air-dried straw and chipped site vegetation. Other cover methods that prevent erosion may also be installed.

The BMPs shown in Figure D.7.3.A must be installed as clearing progresses. For example, the rock construction entrance must be installed as soon as the path for the driveway has been cleared. Additional ESC measures must be installed if the ones proposed above prove insufficient.
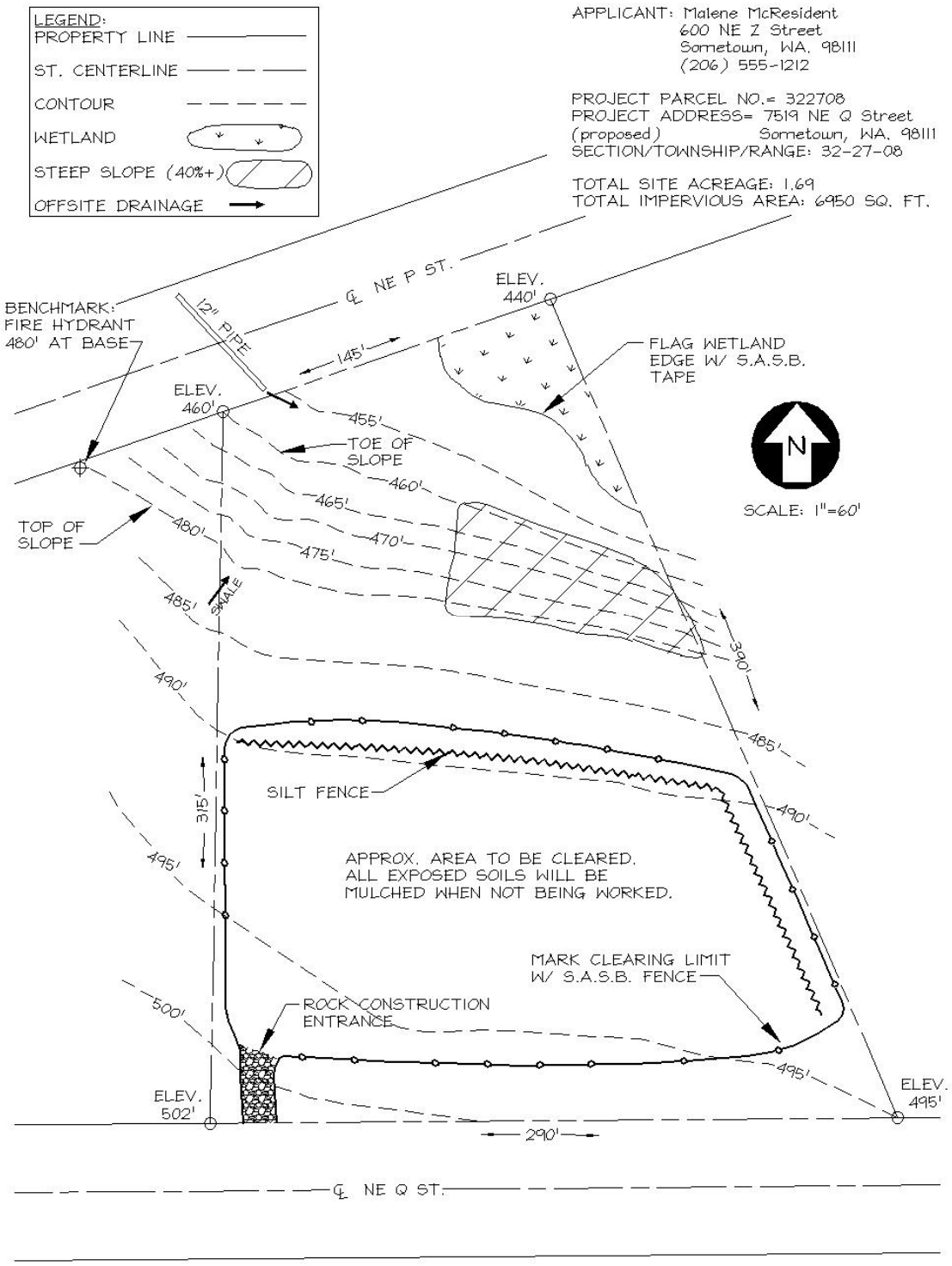
FIGURE D.7.3.A SAMPLE SMALL SITE ESC PLAN