

CHAPTER 5 – LAND DISTURBING ACTIVITIES



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5.1 INTRODUCTION

The purpose of these requirements is to provide the design criteria necessary to preserve the quality of the City's water courses; minimize surface and ground water quality degradation; protect adjacent and downstream property owners from erosion and flooding; and ensure the safety and stability of the City's streets and right-of-ways. This chapter provides requirements for all land disturbing activities. The design of temporary erosion and sediment control (ESC), clearing and grading plans shall conform to the requirements herein.

Although the construction phase of a project is usually considered a temporary condition, construction work may take place over several seasons. All Best Management Practices (BMPs) used in the course of construction should be of sufficient size, strength, and durability to readily outlast the expected construction schedule and operate properly during the design storm rainfall conditions. Maintenance of these BMPs is mandatory.

Clearing and grubbing permits and grading permits do not allow the disturbance of critical areas per SVMC Title 21.40 without a scientific report backed by professional study and acceptance by the City.

5.2 GEOTECHNICAL EVALUATION

5.2.1 APPLICABILITY

The City shall require a geotechnical evaluation when the proposed land disturbing activity includes one or more of the following situations:

- A proposed design does not adhere to the criteria specified in this chapter;
- Cut or fill slopes 2:1 (horizontal to vertical) or steeper, and heights greater than 2 ½ feet;
- Cuts or fills slopes 10:1 (horizontal to vertical) or steeper with heights 4 feet or greater;
- Slope lengths requiring terraces (see Section 5.7);
- Areas with shallow groundwater or springs;
- Projects that include areas of questionable soil conditions or stability, as determined by the City;
- Areas with erodible soils and/or landslides;
- Slopes with surface water flows,
- Unusual situations are encountered;
- Projects with potential negative affect down stream or to neighboring parcels; or,

- A geotechnical investigation is otherwise required in accordance with the *International Building Code (IBC)*, *International Residential Code (IRC)*, *Spokane Regional Stormwater Manual (SRSM)*, or other sections of these Street Standards.

5.2.2 QUALIFIED PROFESSIONAL

A qualified geotechnical engineer (a professional engineer currently licensed in the State of Washington with geotechnical engineering as a specialty) is required to perform the geotechnical evaluation.

5.2.3 GEOTECHNICAL REPORT

The geotechnical report shall include:

- Project description;
- Soil description, including classification, nature, distribution, erosion hazards, and strength of existing surface and subsurface soils;
- A description of site conditions that have the potential to impact the project design such as limiting layers, shallow groundwater, springs, shallow bedrock, etc.;
- Supporting data and a discussion of the results;
- A map drawn to scale showing the location of sampling points, water features, and features of geotechnical concern;
- Adequacy and stability of the geologic subsurface for cuts and fills, including allowable cut and fill slope inclinations;
- Recommendations for surface and subsurface drainage;
- Recommendations for grading, including site preparation and placement of fill;
- Calculations and recommendations for pavement design;
- Sub-level structure recommendations for projects with shallow groundwater, springs and shallow bedrock per the SRSM;
- Foundation recommendations; and,
- Discussion regarding the finished slope stability.

5.3 CLEARING, GRUBBING & GRADING

This section provides general criteria for clearing, grubbing and grading activities. In general, clearing, grubbing and grading activities shall:

- Not contribute to or create erosion, landslides, accelerated soil creep, settlement of soils, or flooding of public or private property;

- Not contribute to or create flooding, erosion, increased turbidity, or siltation of a watercourse;
- Contain provisions for the preservation of natural features, sensitive and critical areas, and drainage courses;
- Expose the smallest area of soil for the least amount of time;
- Within pipeline hazard areas, identified in SVMC 19.110.040, meet the standards and notification requirements of that section;
- Minimize groundwater and tree disturbance; and,
- Not divert existing watercourses.

If an existing excavation, embankment, fill, or cut is or will become a hazard to life or limb, endanger property, or adversely impact the safety, use or stability of public or private property, drainage channel or natural resource, the Applicant shall repair and/or eliminate such hazard upon receiving notice from the City within the period specified therein. It is the responsibility of the property owner or Applicant to share information defined above with the City.

5.4 EROSION AND SEDIMENT CONTROL REQUIREMENTS

The Applicant for a development permit is ultimately responsible for containing all soil on the project site and must recognize the potential for changing or unexpected site and weather conditions.

The ESC plan shall be prepared in accordance with Chapter 9 - Erosion and Sediment Control Design of the SRSM, as amended. Detailed examples and descriptions of the BMPs referenced in the above chapter are included in Chapter 7 of the *Eastern Washington Stormwater Manual*. The ESC plan shall address and include the following items:

- A narrative addressing information about the site topography, drainage soils, and vegetation; potential erosion problem areas; and actions to be taken in the event the BMPs do not meet performance criteria;
- Construction sequence;
- Construction access route;
- Installation of sediment control;
- Provisions for soil stabilization;
- Protection of drainage structures;
- Control of runoff from construction sites;
- Washout site for concrete trucks and equipment;
- Material storage/stockpiling;
- The proper handling of cut and fill slopes;

- Stabilization of temporary conveyance channels and outlets;
- De-watering of construction site;
- Control of pollutants other than sediment on construction sites, including airborne particulate (dust); and
- Maintenance of BMPs.

A site log shall be completed for the project. The site log shall include the results of all site inspections, sampling, and other records. For sites one acre or larger, inspections must be conducted by a Certified Erosion and Sediment Control Lead (CESCL).

5.5 CUTS AND FILLS

5.5.1 GENERAL REQUIREMENTS

Unless otherwise recommended by a geotechnical evaluation, cut and fill slopes shall conform to the following provisions:

- Cut and fill slopes shall be no steeper than is safe for the intended use;
- Cut slopes shall be rounded off so as to blend in with natural terrain;
- Permanent cut slopes shall not be constructed steeper than 2:1 (horizontal to vertical);
- Cut and fill slopes shall not exceed 20 feet in vertical height or 75 feet in slope length without a terrace break (Figure 5-1). Interceptor ditches may be required if a geotechnical evaluation determines they are needed or as required in Section 5.6.
- Cut and fill slopes shall be stabilized by terracing, cat tracking, jute mat, grass sod, hydroseeding, or by other planting or surfacing materials approved by the City. The erosion control measures shall be installed per the SRSM and shall be maintained by the Applicant;
- Cut and fill slopes and related drainage facilities shall not encroach upon adjoining property without a recorded easement from the adjacent owner;
- Cut and fill slopes shall be provided with subsurface and surface drainage provisions to approved drainage locations;
- Fill slopes shall not be constructed on natural slopes steeper than 2:1 (horizontal to vertical) unless an engineer devises a method of placement which ensures the fill will remain in place;
- Drywells shall not be placed in fill slopes or loosely placed fill on grade (see the SRSM); and,
- Temporary or permanent stormwater runoff shall not be directed onto or near a slope without providing for stabilization. See Section 5.6 for additional requirements.

5.5.2 GROUND PREPARATION AND FILL MATERIAL

Unless otherwise recommended by a geotechnical evaluation approved by the City, grading activities shall conform to the following provisions:

- Prior to any fill being placed, all vegetation, topsoil and other unsuitable material shall be removed;
- Top 6 inches of subgrade shall be scarified and compacted before placing fill;
- Fill material shall be placed in lifts of no more than 12 inches;
- All fills shall be compacted to a minimum relative dry density of 95 percent as determined in accordance with ASTM Standard D-1557-78 Modified Proctor, or as directed by the geotechnical engineer. Verification of field density shall be conducted in accordance with ASTM Standard D-1556-82 or equivalent. Verification shall be submitted for any fill where such fill may support the foundation for a structure. Additional compaction tests may be required by the City at any time;
- Where slopes are 5:1 (horizontal to vertical) or steeper, and the depth of the fill exceeds 5 feet, an engineered key shall be dug into undisturbed, solid component soil or bedrock beneath the toe of the proposed fill. The key shall be engineered (see Figure 5-1);
- Where the depth of the fill exceeds 20 feet, an engineered key shall be provided in conformance with Figure 5-1;
- Fill material shall be free from tree stumps, detrimental amounts of organic matter, frozen soil, trash, garbage, sod, peat, and other similar materials. Rocks larger than 6 inches in greatest dimension shall not be used unless the method of placement is properly devised, continuously inspected, and approved by the City.

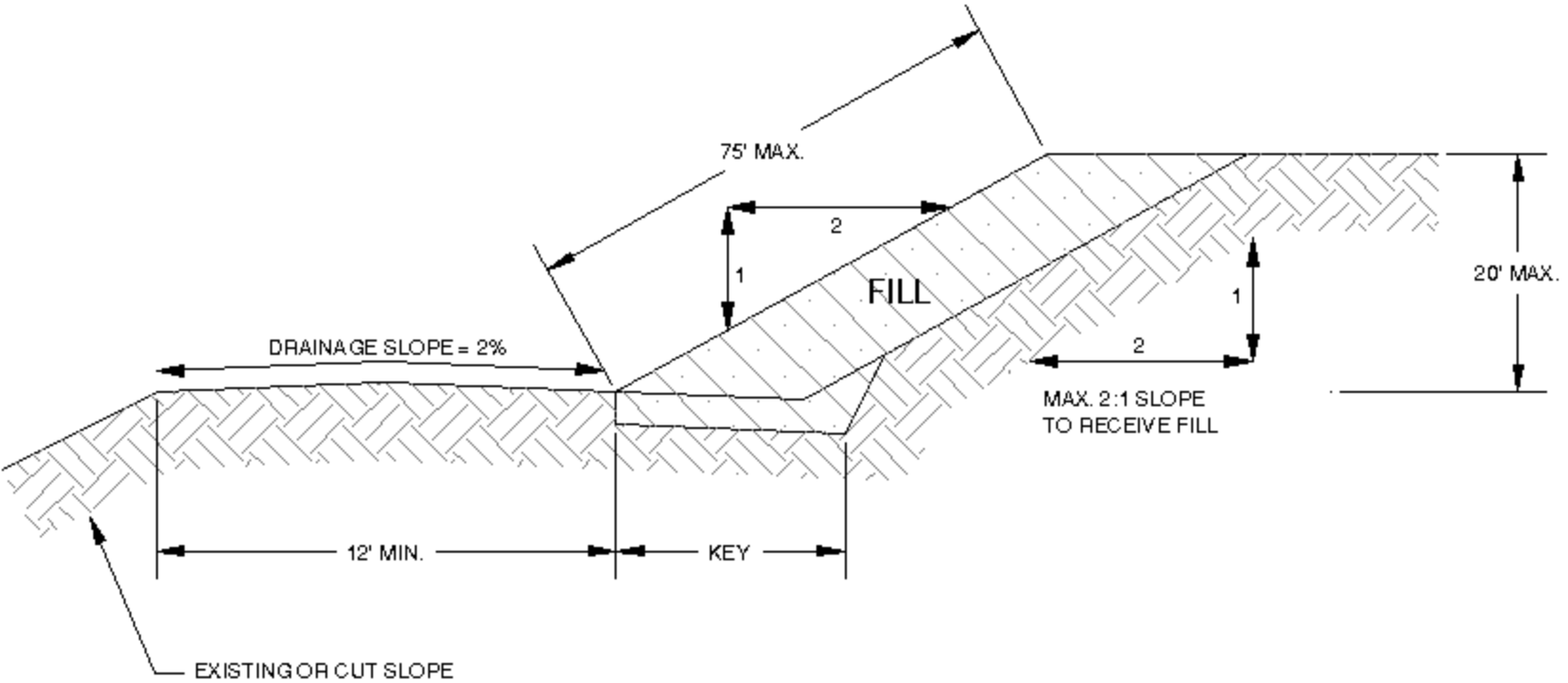


FIGURE 5-1 FILL MINIMUM REQUIREMENTS

5.5.3 CUT AND FILL SETBACKS

Tops and toes of cut and fill slopes shall be set back from property boundaries and structures as far as necessary for the safety of the adjacent properties and to prevent damage resulting from stormwater, flooding, slope erosion or sediment deposition.

If cut and fill slopes meet the applicability listed in Section 5.2, setbacks shall conform to the following provisions:

- Setbacks shall not be less than as shown in Figure 5-2;
- Where a cut or a fill slope is to be located near the property line, additional precautions shall be provided to protect the adjoining property. These include, but are not limited to:
 - The toe of slope shall not be located closer than distances equal to $1/5$ the height of the slope (H) to the property line. The setback shall be at least 2 feet but does not need to be more than 20 feet;
 - The top of slope shall not be located closer than a distance equal to $1/5$ H to the property line. The setback shall be at least 2 feet but does not need to be more than 10 feet;
 - Provisions for retaining walls;
 - Mechanical or chemical treatment of the fill slope surface to minimize erosion;
 - Provisions for the control of surface waters;
 - Recommendations from a geotechnical engineer.

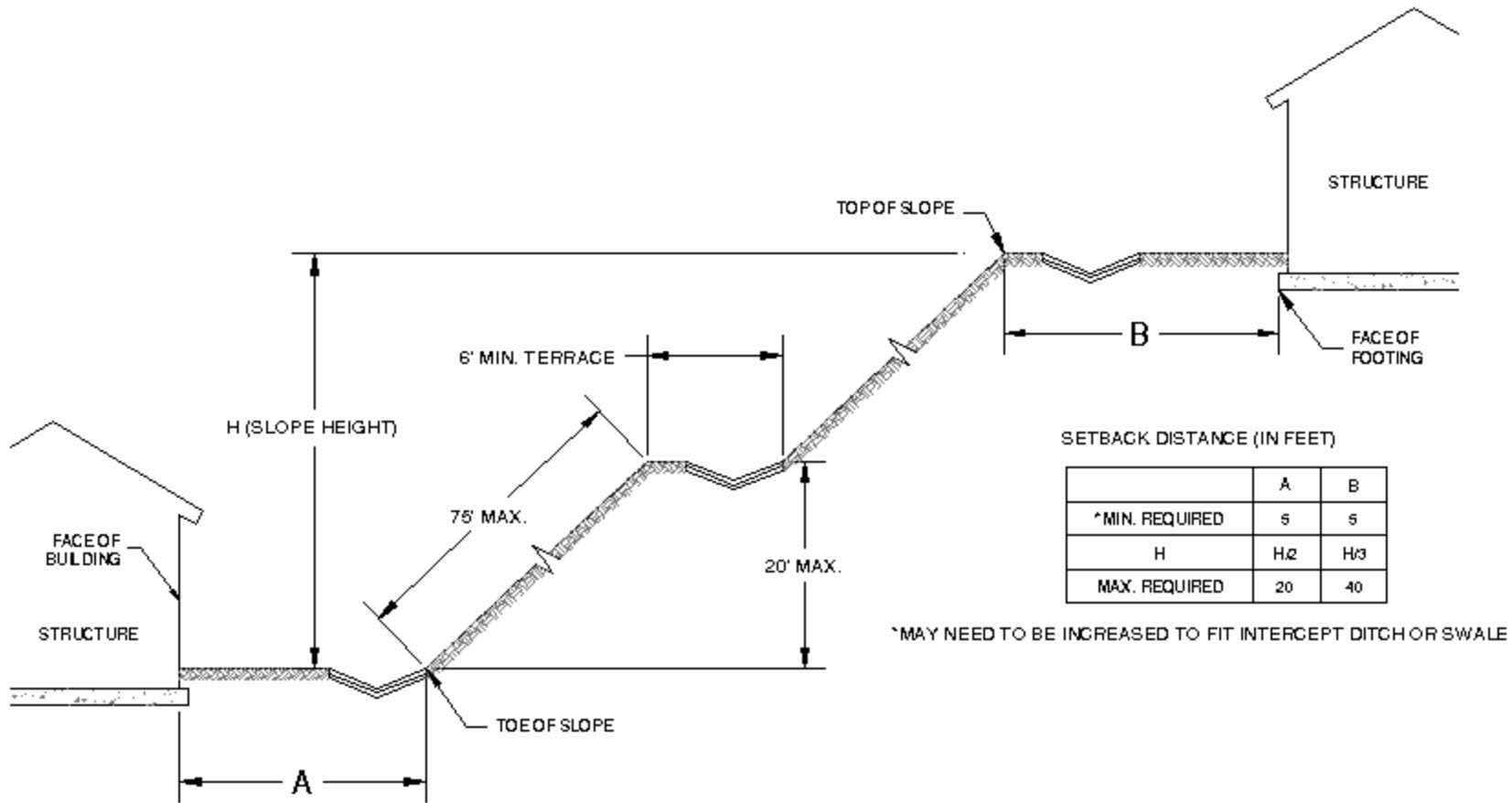


FIGURE 5-2 SETBACKS

5.6 TERRACING

A geotechnical engineer shall review all proposed terracing. Unless otherwise recommended by a geotechnical engineer, all terracing shall conform to the provisions of this section:

- Terraces at least 6 feet in width shall be established at not more than 20-foot vertical intervals or 75-foot slope length on all cut or fill slopes to control surface drainage and debris. When only one terrace is required, it shall be at mid-height;
- Swales or ditches shall be provided on terraces. They shall have a minimum gradient of 5 percent and shall be paved with reinforced concrete not less than 3 inches in thickness, or an approved equal. They shall have a minimum depth of 1 foot and a minimum paved width of 5 feet;
- Where more than 2 terraces are required, one terrace located at approximately mid-height, shall be at least 12 feet wide;
- A single run of swale or ditch shall not collect runoff from a tributary area exceeding 13,500 square feet (projected) without discharging into a down drain;
- All drainage facilities shall be designed to carry the 100-year storm event to an approved location. The drainage facility shall include a freeboard consistent with the SRSM. Stormwater runoff shall leave the site in the same manner and location as it did in the pre-developed condition;
- Lots shall be graded so as to drain surface water away from foundation walls; and,
- Paved interceptor drains shall be installed along the top of all cut slopes, where the tributary drainage area above, slopes toward the cut and has a drainage path greater than 40 feet, measured horizontally. Interceptor drains shall be paved with a minimum 3 inches of reinforced concrete, or an approved equivalent. Drains shall have a minimum depth of 1-foot and minimum paved width of 3 feet, measured horizontally across the drain. The slope shall not be less than 2 percent.

5.7 SLOPE EASEMENTS

Slope easements adjacent to the right-of-way for protection and maintenance of cut or fill slopes and drainage facilities may be required on shouldered streets with side slope of 3:1 or steeper. Easement shall be from the catch point plus a minimum of 5 feet and shall include retaining walls and reinforcements, as applicable. This space provides for utility poles, fences, sloped rounding, etc.

5.8 RETAINING WALLS

Retaining walls shall be submitted to the Building Division for review. Retaining walls with a vertical difference of 2.5 feet or greater within 2 feet pedestrian corridors, and areas where maintenance personnel will be required to access, shall require a handrail.

An engineered wall design is required for walls 4 feet or higher, measured from the bottom of the footing to the top of the wall. The engineered design shall include a soils investigation and report by a geotechnical engineer and structural calculations to support the wall design.

Rockerries used as retaining walls shall conform to the requirements of the latest addition of the Associated Rockery Contractors *Rock Wall Construction*.

Unless otherwise recommended by a geotechnical engineer, underdrains are required for all retaining walls over 4 feet in height, measured from the bottom of the footing to the top of the wall. A minimum 6-inch diameter perforated or slotted drainpipe shall be placed in a shallow excavated trench located along the inside edge of the keyway. The pipe shall be bedded on and surrounded by “Gravel Backfill for Drains” (WSDOT/APWA 9-03.12(4)) to a minimum height of 18 inches above the bottom of the pipe. The drain pipe shall drain to a point of discharge indicated on the grading or civil plans.

A filter fabric shall surround the gravel backfill and shall have a minimum of 1-foot overlap along the top surface of the gravel. The perforated pipe shall be connected to a stormwater facility.

A minimum of 18 inches of granular drainage material shall be placed between the undisturbed soil or engineered fill and the wall. The drainage material shall meet criteria for Gravel Backfill for Walls (WSDOT/APWA 9-0.3.12(2)).