

CHAPTER 2

2.000 EXCAVATION AND GRADING

The purpose of this chapter is to safeguard life, limb, property and the public welfare by regulating grading on private property. This chapter sets forth rules and regulations to control excavation, grading and earthwork construction, including fills and embankments; establishes the administrative procedure for issuance of permits; and provides for approval of plans and inspection of grading construction.

A grading permit from the Building Official is required for all excavation, grading, and earthwork construction, including fills and embankments, on public and private land except as exempted herein. Grading permits are required to be obtained **before** any excavation, grading, or filling takes place. A separate permit shall be obtained for each site, and may cover both excavations and fills.

Each application for a grading permit shall be accompanied by a plan and all applicable reports. See the Grading Plan Checklist at the end of this chapter for Grading Plan requirements.

A. Exemptions

A grading permit is not required for the following:

1. When approved by the Building Official, grading in an isolated, self-contained area if there is no danger to private or public property.
2. An excavation below finished grade for basements and footings of a building, retaining wall or other structure authorized by a valid building permit.

EXCEPTION: This shall not exempt any fill made with the material from such excavation or exempt any excavation having an unsupported height greater than 5 feet after the completion of such structure.

3. Cemetery graves.
4. Refuse disposal sites controlled by other regulations.

5. Excavations for wells or tunnels or utilities.
6. Mining, quarrying, excavating, processing or stockpiling of rock, sand, gravel, aggregate or clay where established and provided for by law, provided such operations do not affect the lateral support or increase the stresses in or pressure upon any adjacent or contiguous property.
7. Exploratory excavations under the direction of soil engineers or engineering geologists.
8. An excavation that (1) is less than 2 feet in depth or (2) does not create a cut slope greater than 5 feet in height and steeper than 1 unit vertical in 1 1/2 units horizontal (66.7% slope).
9. A fill less than 1 foot in depth and placed on natural terrain with a slope flatter than 1 unit vertical in 5 units horizontal (20% slope), or less than 3 feet in depth, not intended to support structures, that does not exceed 50 cubic yards on any one lot and does not obstruct a drainage course.

NOTE: Exemption from the permit requirements of this chapter shall not be deemed to grant authorization for any work to be done in any manner in violation of the provisions of this chapter or any other laws or ordinances of this jurisdiction.

10. The construction of stormwater ponds is not exempted unless the excavated material is disposed of outside of the City's jurisdiction.
11. S.T.E.P. tanks installed with a valid S.T.E.P. application under the direction of a City Public Works inspector are exempt from a grading permit provided that the material excavated for the tank is not deposited where the footing of any structure will be constructed.

B. Recognized Testing Standards

ASTM D 1557, Moisture-density Relations of Soils and Soil Aggregate Mixtures

ASTM D 1556, In Place Density of Soils by the Sand-Cone Method

ASTM D 2167, In Place Density of Soils by the Rubber-Balloon Method

ASTM D 2937, In Place Density of Soils by the Drive-Cylinder Method

ASTM D 2922 and D 3017, In Place Moisture Content and Density of Soils by Nuclear Methods

C. Hazards

Whenever the Building Official determines that any existing excavation or embankment or fill on private property has become a hazard to life and limb, or endangers property, or adversely affects the safety, use or stability of a public way or drainage channel, the owner of the property upon which the excavation or fill is located, or other person or agent in control of said property, upon receipt of notice in writing from the Building Official, shall within the period specified therein repair or eliminate such excavation or embankment to eliminate the hazard and to be in conformance with the requirements of this code.

D. Definitions

For the purposes of this chapter, the definitions listed hereunder shall be construed as specified in this chapter.

“Approval” -- shall mean that the proposed work or completed work conforms to this chapter in the opinion of the Building Official.

“As-graded” -- is the extent of surface conditions on completion of grading.

“Bedrock” -- is in-place solid rock.

“Bench” -- is a relatively level step excavated into earth material on which fill is to be placed.

“Borrow” -- is earth material acquired from an off-site location for use in grading on a site.

“Building Official” -- is the City of Lacey Building Official or his/her designated appointee.

“Civil Engineer” -- is a professional engineer registered in the state to practice in the field of civil works.

“Civil Engineering” -- is the application of the knowledge of the forces of nature, principles of mechanics and the properties of materials to the evaluation, design and construction of civil works.

“Compaction” -- is the densification of a fill by mechanical means.

“Earth Material” -- is any rock, natural soil or fill or any combination thereof.

“Engineering Geologist” -- is a geologist experienced and knowledgeable in engineering geology.

“Engineering Geology” -- is the application of geologic knowledge and principles in the investigation and evaluation of naturally occurring rock and soil for use in the design of civil works.

“Erosion” -- is the wearing away of the ground surface as a result of the movement of wind, water or ice.

“Excavation” -- is the mechanical removal of earth material.

“Existing Grade” -- is the grade prior to grading.

“Fill” -- is a deposit of earth material placed by artificial means.

“Finish Grade” -- is the final grade of the site that conforms to the approved plan.

“Geotechnical Engineer” -- See “Soils Engineer”

“Grade” -- is the vertical location of the ground surface.

“Grading” -- is any excavating or filling or combination thereof.

“Key” -- is a designed compacted fill placed in a trench excavated in earth material beneath the toe of a proposed fill slope.

“Land Surveyor” -- see Chapter 3.025.

“Professional Inspection” -- is the inspection required by this code to be performed by the civil engineer, soils engineer or engineering geologist. Such inspections include that performed by persons supervised by such engineers or geologists and shall be sufficient to form an opinion relating to the conduct of the work.

“Rough Grade” -- is the stage at which the grade approximately conforms to the approved plan.

“Site” -- is any lot or parcel of land or contiguous combination thereof, under the same ownership, where grading is performed or permitted.

“Slope” -- is an inclined ground surface the inclination of which is expressed as a ratio of horizontal distance to vertical distance.

“Soil” -- is naturally occurring superficial deposits overlying bedrock.

“Soils Engineer” (“Geotechnical Engineer”) -- is an engineer experienced and knowledgeable in the practice of soils engineering (geotechnical) engineering.

“Soils Engineering” (“Geotechnical Engineering”) -- is the application of the principles of soils mechanics in the investigation, evaluation and design of civil works involving the use of earth materials and the inspection or testing of the construction thereof.

“Terrace” -- is a relatively level step constructed in the face of a graded slope surface for drainage and maintenance purposes.

E. Permit Requirements

To obtain a permit, the applicant shall first file an application therefore in writing on a form furnished by the Building Department. The application shall:

1. Identify and describe the work to be covered by the permit for which application is made.
2. Identify the estimated quantities of work involved.
3. Describe the land on which the proposed work is to be done by legal description, street address or similar description that will readily identify and definitely locate the proposed building or work.
4. Indicate the use for which the proposed work is intended.
5. Be accompanied by plans, diagrams, computations and specifications and other data as required.
6. Be signed by the applicant, or the applicant's authorized agent.
7. Give such other data and information as may be required by the Building Official.

F. Grading Designation

Grading in excess of 5,000 cubic yards shall be performed in accordance with the approved grading plan prepared by a civil engineer, and shall be designated as "engineered grading."

Grading involving less than 5,000 cubic yards shall be designated "regular grading" unless the permittee chooses to have the grading performed as engineered grading, or the Building Official determines that special conditions or unusual hazards exist, in which case grading shall conform to the requirements for engineered grading.

Engineered Grading Requirements. Application for a grading permit shall be accompanied by four sets of plans and specifications, and supporting data consisting of a soils engineering report and engineering geology report.

G. Plans and Reports

The plans and specifications shall be prepared and signed by an individual licensed by the state to prepare such plans or specifications when required by the Building Official.

Specifications shall contain information covering construction and material requirements.

Plans shall be drawn to scale upon substantial paper or cloth and shall be of sufficient clarity to indicate the nature and extent of the work proposed and show in detail that they will conform to the provisions of this code and all relevant laws, ordinances, rules and regulations. The first sheet of each set of plans shall give location of the work, the name and address of the owner, and the person by whom they were prepared.

The plans and reports shall include all applicable information listed in the Grading Plan Checklist at the end of this chapter.

Recommendations included in the soils engineering report and the engineering geology report shall be incorporated in the grading plans or specifications. When approved by the Building Official, specific recommendations contained in the soils engineering report and the engineering geology report, which are applicable to grading, may be included by reference.

H. Liquefaction Study

The Building Official may require a geotechnical investigation to determine the potential for seismically induced soil liquefaction and soil instability. See Grading Plan Checklist for applicable information.

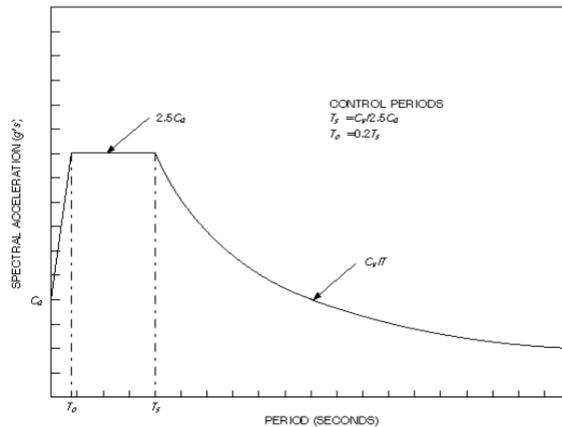
The potential for soil liquefaction and soil strength loss during earthquakes shall be evaluated during the geotechnical investigation. The Geotechnical Report shall assess potential consequences of any liquefaction and soil strength loss, including estimation of differential settlement, lateral movement or reduction in foundation soil-bearing capacity, and discuss mitigating measures. Such measures shall be given consideration in the design of the building and may include, but are not limited to, ground stabilization, selection of appropriate foundation type and depths, selection of appropriate structural systems to accommodate anticipated displacements, or any combination of these measures.

The potential for liquefaction and soil strength loss shall be evaluated for a site peak ground acceleration that, as a minimum, conforms to the probability of exceeding specified herein.

Peak ground acceleration may be determined based on a site-specific study taking into account soil amplification effects. In the absence of such a study, peak ground acceleration may be assumed equal to the seismic zone 3 with a 0.30 Z factor for the City of Lacey.

The ground motion representation shall, as a minimum, be one having a 10-percent probability of being exceeded in 50 years, shall not be reduced by the quantity R and may be one of the following:

1. An elastic design response spectrum constructed in accordance with the Design Response Spectra table below, using the values of C_a and C_v consistent with the specific site. The design acceleration ordinates shall be multiplied by the acceleration of gravity, 386.4 in./sec.².



2. A site-specific elastic design response spectrum based on the geologic, tectonic, seismologic and soil characteristics associated with the specific site. The spectrum shall be developed for a damping ratio of 0.05, unless a different value is shown to be consistent with the anticipated structural behavior at the intensity of shaking established for the site.
3. Ground motion time histories developed for the specific site shall be representative of actual earthquake motions. Response spectra from time histories, either individually or in combination, shall approximate the site design spectrum conforming to item number 2 above.
4. For structures, regular or irregular, that have a period greater than 0.7 seconds on Soil Profile Type S_F , the following requirements shall apply:
 - a. The ground motion representation shall be developed in accordance with Items 2 and 3 above.
 - b. Possible amplification of building response due to the effects of soil-structure interaction and lengthening of building period caused by inelastic behavior shall be considered.
5. The vertical component of ground motion may be defined by scaling corresponding horizontal accelerations by a factor of two-thirds. Alternative factors may be used when substantiated by site-specific data. Where the Near Source Factor, N_a , is greater than 1.0, site-specific vertical response spectra shall be used in lieu of the factor of two-thirds.

I. Permit Issuance

When the Building Official issues the permit where plans are required, the Building Official shall endorse in writing or stamp the plans and specifications APPROVED. Such approved plans and specifications shall not be changed, modified or altered without authorizations from the Building Official, and all work regulated by this code shall be done in accordance with the approved plans.

The Building Official may, but is under no obligation to, issue a permit for the construction of part of the work before the entire plans and specifications have been submitted or approved, provided adequate information and detailed statements have been filed complying with all pertinent requirements of this code. The holder of a partial permit shall proceed without assurance that the permit for the entire building or structure will be granted.

The Building Official may require that grading operations and project designs be modified if delays occur which incur weather-generated problems not considered at the time the permit was issued.

The Building Official may require professional inspection and testing by the soils engineer. When the Building Official has cause to believe that geologic factors may be involved, the grading will be required to conform to engineered grading.

One set of approved plans, specifications and computations shall be retained by the Building Official for a period of not less than 90 days from date of completion of the work covered therein; and one set of approved plans and specifications shall be returned to the applicant, and said set shall be kept on the site of the building or work at all times during which the work authorized thereby is in progress.

The issuance or granting of a permit or approval of plans, specifications and computations shall not be construed to be a permit for, or an approval of, any violation of any of the provisions of this chapter or of any other ordinance of the City. Permits presuming to give authority to violate or cancel the provisions of this chapter or other ordinances of the City shall not be valid.

The issuance of a permit based on plans, specifications and other data shall not prevent the Building Official from thereafter requiring the correction of errors in said plans, specifications and other data,

or from preventing building operations being carried on thereunder when in violation of this code or of any other ordinances of the City.

J. Permit Terms, Expiration, and Extension

Every permit issued under the provisions of this code shall expire and become null and void if the work authorized by such permit is not commenced within one hundred eighty days from the date of such permit, or if the work authorized by such permit is suspended or abandoned at any time after the work has commenced for a period of one hundred eighty days. For the purposes of this chapter, the one hundred eighty days will be deemed to have expired if no inspections have been called for within one hundred eighty days of the date of permit issuance or within one hundred eighty days after a validly called inspection. For an inspection to be a validly called inspection, for the purposes of this chapter, the work being inspected must be complete, ready for the inspection, and noted "approved" by the building official.

Before such work can be recommenced, a new permit shall first be obtained and the fee therefore shall be one-half of the amount required for a new permit for such work provided no changes have been made or will be made in the original plans and specifications for such work and, provided further, that such suspension or abandonment has not exceeded one year.

Any permittee holding an unexpired permit may apply for an extension of time within which he may commence work under that permit, when he is unable to commence work within the time required by this chapter for good and satisfactory reasons satisfactory to the building official. The building official may extend the time for action by the permittee for a period not exceeding one hundred eighty days upon written request by the permittee showing that circumstances beyond the control of the permittee have prevented action from being taken. No permit shall be extended more than once.

For permits expired for a period of one year or greater, the permittee shall obtain a new permit and pay a new full permit fee.

All permits expire after eighteen months and must be renewed if the work is not yet completed.

K. Permit Suspension or Revocation

The Building Official may, in writing, suspend or revoke a permit issued under the provisions of this code whenever the permit is issued in error or on the basis of incorrect information supplied, or in violation of any ordinance or regulation or any of the provisions of this chapter.

L. Fees and Financial Guarantees

Fees shall be assessed in accordance with the fee Resolution adopted by the City of Lacey City Council. See Appendix A.

When a plan or other data are required to be submitted, a plan review fee shall be paid at the time of submitting plans and specifications for review. Said plan review fee shall be as set forth in the fee Resolution adopted by the City Council. See Appendix A. Separate plan review fees shall apply to retaining walls or major drainage structures as required elsewhere in this code. For excavation and fill on the same site, the fee shall be based on the volume of excavation or fill, whichever is greater.

A fee for each grading permit shall be paid to the Building Official as set forth in the fee Resolution adopted by the City Council (see Appendix A). Separate permits and fees shall apply to retaining walls or major drainage structures as required by the building code or the department of public works permit requirements. There shall be no separate charge for standard terrace drains and similar facilities.

The City may require financial guarantees in such form and amount as may be deemed necessary to ensure that the work, if not completed in accordance with the approved plans and specifications, will be corrected to eliminate hazardous conditions.

In lieu of a surety bond the applicant may file a cash bond or instrument of credit with the Building Official in an amount equal to that which would be required in the surety bond.

M. Cuts and Fills

Unless otherwise recommended in the approved soils engineering or engineering geology report, cuts or fills shall conform to the provisions of this chapter.

In the absence of an approved soils engineering report, these provisions may be waived for minor cuts or fills not intended to support structures.

The slope of cut surfaces shall be no steeper than is safe for the intended use and shall be no steeper than 1 unit vertical in 2 units horizontal (50% slope) unless the permittee furnishes a soils engineering or an engineering geology report, or both, stating that the site has been investigated and giving an opinion that a cut at a steeper slope will be stable and not create a hazard to public or private property.

Fill slopes shall not be constructed on natural slopes steeper than 1 unit vertical in 2 units horizontal (50% slope). The ground surface shall be prepared to receive fill by removing vegetation, non-complying fill, topsoil and other unsuitable materials scarifying to provide a bond with the new fill and, where slopes are steeper than 1 unit vertical in 5 units horizontal (20% slope) and the height is greater than 5 feet, by benching into sound bedrock or other competent material as determined by the soils engineer. The bench under the toe of a fill on a slope steeper than 1 unit vertical in 5 units horizontal (20% slope) shall be at least 10 feet wide. The area beyond the toe of fill shall be sloped for sheet overflow or a paved drain shall be provided. When fill is to be placed over a cut, the bench under the toe of fill shall be at least 10 feet wide but the cut shall be made before placing the fill and acceptance by the soils engineer or engineering geologist or both as a suitable foundation for fill.

Detrimental amounts of organic material shall not be permitted in fills. Except as permitted by the Building Official, no rock or similar irreducible material with a maximum dimension greater than 12 inches shall be buried or placed in fills. The City may permit placement of larger rock when the soils engineer properly devises a method of placement, and continuously inspects its placement and approves the fill stability. The following conditions shall also apply:

Prior to issuance of the grading permit, potential rock disposal areas shall be delineated on the grading plan.

Rock sizes greater than 12 inches in maximum dimension shall be 10 feet or more below grade, measured vertically.

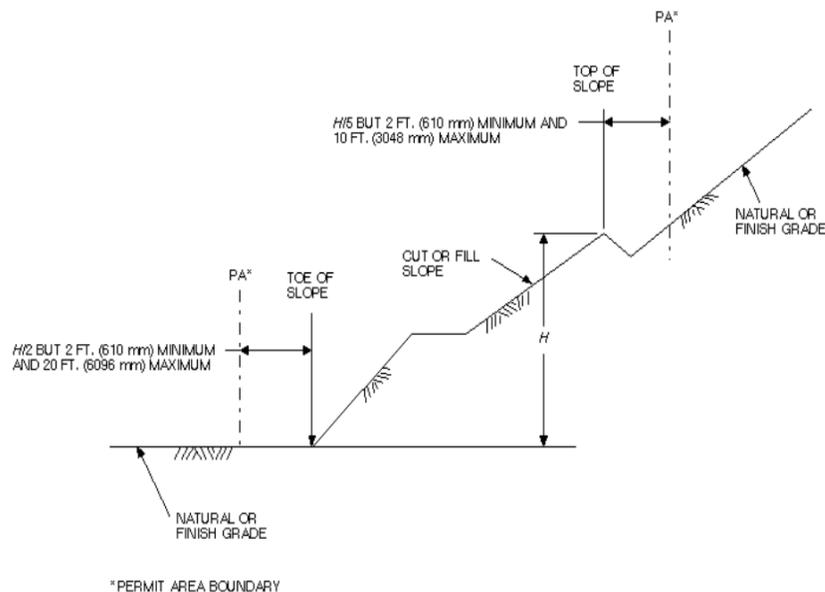
Rocks shall be placed so as to assure filling of all voids with well-graded soil.

All fills shall be compacted to a minimum of 90 percent of maximum density.

The slope of fill surfaces shall be no steeper than is safe for the intended use. Fill slopes shall be no steeper than 1 unit vertical in 2 units horizontal (50% slope).

N. Setbacks

Cut and fill slopes shall be set back from site boundaries in accordance with this chapter. Setback dimensions shall be horizontal distances measured perpendicular to the site boundary. Setback dimensions shall be as shown in the diagram below.



The top of cut slopes shall not be made nearer to a site boundary line than one fifth of the vertical height of cut with a minimum of 2 feet and a maximum of 10 feet. The setback may need to be increased for any required interceptor drains.

The toe of fill slope shall be made not nearer to the site boundary line than one half the height of the slope with a minimum of 2 feet and a maximum of 20 feet. Where a fill slope is to be located near the site boundary and the adjacent off-site property is developed, special precautions shall be incorporated in the work as the

Building Official deems necessary to protect the adjoining property from damage as a result of such grading. These precautions may include but are not limited to:

1. Additional setbacks.
2. Provision for retaining or slough walls.
3. Mechanical or chemical treatment of the fill slope surface to minimize erosion.
4. Provisions for the control of surface waters.

The Building Official may approve alternate setbacks. The Building Official may require an investigation and recommendation by a qualified engineer or engineering geologist to demonstrate that the intent of this chapter has been satisfied.

O. Drainage and Terracing

Unless otherwise indicated on the approved grading plan, drainage facilities and terracing shall conform to the provisions of this chapter for cut or fill slopes steeper than 1 unit vertical in 3 units horizontal (33.3% slope).

Terraces at least 6 feet in width shall be established at not more than 30 foot vertical intervals on all cut or fill slopes to control surface drainage and debris except that where only one terrace is required, it shall be at mid-height. For cut or fill slopes greater than 60 feet and up to 120 feet in vertical height, one terrace at approximately mid-height shall be 12 feet in width. Terrace widths and spacing for cut and fill slopes greater than 120 feet in height shall be designed by the civil engineer and approved by the Building Official. Suitable access shall be provided to permit proper cleaning and maintenance.

Swales or ditches on terraces shall have a minimum gradient of 5 percent and must be paved with reinforced concrete not less than 3 inches in thickness or an approved equal paving. They shall have a minimum depth at the deepest point of 1 foot and a minimum paved width of 5 feet.

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.

Cut and fill slopes shall be provided with subsurface drainage as necessary for stability.

All drainage facilities shall be designed to carry waters to the nearest practicable drainage way approved by the Building Official or the Public Works Department as a safe place to deposit such waters. Erosion of ground in the area of discharge shall be prevented by installation of non-erosive downdrains or other devices.

Building pads shall have a drainage gradient of 2 percent toward approved drainage facilities, unless waived by the Building Official.

Exception: the gradient from the building pad may be 1 percent if all of the following conditions exist throughout the permit area:

1. No proposed fills are greater than 10 feet in maximum depth.
2. No proposed finish cut or fill slope faces have a vertical height in excess of 10 feet.
3. No existing slope faces steeper than 1 unit vertical in 10 units horizontal (10% slope) have a vertical height in excess of 10 feet.

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 of 3 inches of concrete or gunite and reinforced. They shall have a minimum depth of 12 inches and a minimum paved width of 30 inches measured horizontally across the drain. The Building Official shall approve the slope of drain.

P. Erosion Control

The faces of cut and fill slopes shall be prepared and maintained to control against erosion. All erosion control shall comply with the City of Lacey Erosion Control Manual. The protection for the slopes shall be installed as soon as practicable and prior to calling for final approval. Where cut slopes are not subject to erosion due to the erosion-resistant character of the materials, such protection may be omitted.

Where necessary, check dams, cribbing, riprap or other devices or methods shall be employed to control erosion and provide safety.

Q. Grading Inspection

Grading operations for which a permit is required shall be subject to inspection by the City.

Professional inspection of grading operations shall be provided by the civil engineer, soils engineer and the engineering geologist retained to provide such services in accordance with this chapter for engineered grading and as required by the City for regular grading.

The civil engineer shall provide professional inspection within such engineer's area of technical specialty, which shall consist of observation and review as to the establishment of line, grade and surface drainage of the development area. If revised plans are required during the course of the work they shall be prepared by the civil engineer.

The soils engineer shall provide professional inspection within such engineer's area of technical specialty, which shall include observation during grading and testing for required compaction. The soils engineer shall provide sufficient observation during the preparation of the natural ground and placement and compaction of the fill to verify that such work is being performed in accordance with the conditions of the approved plan and the appropriate requirements of this chapter. Revised recommendations relating to conditions differing from the approved soils engineering and engineering geology reports shall be submitted to the permittee, the City and the civil engineer.

The engineering geologist shall provide professional inspection within such engineer's area of technical specialty, which shall include professional inspection of the bedrock excavation to determine if conditions encountered are in conformance with the approved report. Revised recommendations relating to conditions differing from the approved engineering geology report shall be submitted to the soils engineer.

The permittee shall be responsible for the work to be performed in accordance with the approved plans and specifications and in conformance with the provisions of this code, and the permittee shall engage consultants, if required, to provide professional

inspections on a timely basis. The permittee shall act as a coordinator between the consultants, the contractor and the City. In the event of changed conditions, the permittee shall be responsible for informing the City of such change and shall provide revised plans for approval.

The City shall inspect the project at the various stages of work requiring approval to determine that adequate control is being exercised by the professional consultants.

If, in the course of fulfilling their respective duties under this chapter, the civil engineer, the soils engineer or the engineering geologist finds that the work is not being done in conformance with this chapter or the approved grading plans, the discrepancies shall be reported immediately in writing to the permittee and to the City.

If the civil engineer, the soils engineer, or the engineering geologist of record is changed during grading, the work shall be stopped until the replacement has agreed in writing to accept their responsibility within the area of technical competence for approval upon completion of the work. It shall be the duty of the permittee to notify the City in writing of such change prior to the recommencement of such grading.

R. Completion of Work

Upon completion of the rough grading work and at the final completion of the work, the following reports and drawings and supplements thereto are required for engineered grading or when professional inspection is performed for regular grading, as applicable.

An as-built grading plan prepared by the civil engineer retained to provide such services showing original ground surface elevations, as-graded ground surface elevations, lot drainage patterns, and the locations and elevations of surface drainage facilities and of the outlets of subsurface drains. As-constructed locations, elevations and details of subsurface drains shall be shown as reported by the soils engineer.

Civil engineers shall state that to the best of their knowledge the work within their area of responsibility was done in accordance with the final approved grading plan.

A report prepared by the soils engineer retained to provide such services in accordance with this chapter, including locations and

elevations of field density tests, summaries of field and laboratory tests, other substantiating data, and comments on any changes made during grading and their effect on the recommendations made in the approved soils engineering investigation report.

Soil engineers shall submit a statement that, to the best of their knowledge, the work within their area of responsibilities is in accordance with the approved soils engineering report and applicable provisions of this chapter.

A report prepared by the engineering geologist retained to provide such services in accordance with this chapter, including a final description of the geology of the site and any new information disclosed during the grading and the effect of same on recommendations incorporated in the approved grading plan.

Engineering geologists shall submit a statement that, to the best of their knowledge, the work within their area of responsibility is in accordance with the approved engineering geologist report and applicable provisions of this chapter.

The grading contractor shall submit in a form prescribed by the City a statement of conformance to said as-built plan and the specifications.

The permittee shall notify the City when the grading operation is ready for final inspection. Final approval shall not be given until all work, including installation of all drainage facilities and their protective devices, and all erosion-control measures have been completed in accordance with the final approved grading plan, and the required reports have been submitted.

GRADING PLAN CHECKLIST**GENERAL REQUIREMENTS FOR ALL GRADING PERMITS:**

- () Vicinity Map of the Proposed Site
- () Parcel Boundaries certified by a Land Surveyor
- () Legend
- () North Arrow
- () Datum - Bench Mark Designation, Elevation, and Location (on all sheets where elevations are referenced)
- () Datum - Horizontal, City of Lacey Ground Scale (show ties to control)
- () Scale Bar
- () Section, Township and Range
- () Lot and Subdivision and/or Parcel Number
- () Project Title
- () Utilities, Both Existing and Proposed (above and below ground including buried tanks)
- () Contour Lines of Existing Ground at a maximum of 2 foot intervals
- () Contour Lines of Existing Ground at Least 50 Feet Beyond Site Boundaries Sufficient to Depict Area Drainage
- () Contour Lines of Proposed Finished Grade
- () Proposed Drainage Channels depicting all surface and subsurface drainage devices, walls, cribbing, dams and other protective devices to be constructed with, or as part of, the proposed work together with the estimated runoff of the area served by and drains.
- () Existing Structures on Project Parcel
- () Existing Structures On the Subject Parcel and Within 100 Feet of the Project Boundary
- () Proposed Structures on Project Site
- () Wells (active, inactive and proposed)
- () Easements, Both Existing and Proposed

- () Erosion Control Plan per Chapter 5. See Chapter 3.040 for the Public Work's Plan Checklist containing the Erosion Control Plan checklist components.
- () Soil Type
- () Construction Entrance per the City of Lacey Drainage Design and Erosion Control Manual
- () Quantities of Work Involved

ADDITIONAL ITEMS REQUIRED FOR ENGINEERED GRADING PERMIT:**() Soils Engineering Report:**

- () Date of Report
- () Name, Address, and Phone Number of Firm and/or Individual who Prepared Report
- () Nature, Distribution and Strength of Existing Soils
- () Conclusions and Recommendations for Grading Procedures
- () Design Criteria for Corrective Measures, Including Buttress Fills when necessary, and Opinion on Adequacy for the Intended Use of Sites to be Developed by the Proposed Grading as Affected by Soils Engineering Factors, Including the Stability of Slopes

() Engineering Geology Report:

- () Date of Report
- () Name, Address, and Phone Number of Firm and/or Individual who Prepared Report
- () Description of the Geology of the Site
- () Conclusions and Recommendations Regarding the Effect of Geologic Conditions on the Proposed Development
- () Opinion on the Adequacy for the Intended Use of Site to be Developed by the Proposed Grading as Affected by Geologic Factors

() Liquefaction Study:

May be Required to Determine the Potential for Seismically Induced Soil Liquefaction and Soil Instability when, during the Course of an Investigation, all of the Following Conditions are Discovered:

- ◆ Ground Water at 50 Feet or Less
 - ◆ Unconsolidated Sandy Alluvium
- () Detailed Plans of all Surface and Subsurface Drainage Devices, Walls, Cribbing, Dams and other Protective Devices to be Constructed with, or as a part of, the Proposed Work, Together with a Map Showing the Drainage Area and the Estimated Runoff of the Area Served by any Drains.

- () Recommendations Included in the Soils Engineering Report and the Engineering Geology Report Shall be Incorporated in the Grading Plans or Specifications.

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