# ORANGE COUNTY GRADING MANUAL



# **OC PUBLIC WORKS**

# **2017 Edition**

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#### SUBARTICLE 1. GENERAL PROVISIONS

#### 1.1 <u>Authority</u>

The OC Grading Manual is authorized by Section 7-1-801 of the Orange County Grading and Excavation Code.

#### 1.2 <u>Scope and Purpose</u>

The Orange County Grading Manual (hereinafter referred to as OC Grading Manual) is a compilation of rules, procedures, and interpretations, necessary to carry out the provisions of the Orange County Grading Code. The OC Grading Manual is organized to follow the content of subarticles in the OC Grading and Excavation Code.

The purpose of the OC Grading Manual is to assist users of the OC Grading Code by supplementing it with detailed information regarding rules, interpretations, standard specifications, procedures, requirements, forms and other information used to control excavation, grading and earthwork construction in unincorporated Orange County.

It is the intent of the Director of OC Public Works to work with industry representatives to develop such rules, interpretations, standard specifications, procedures, requirements, and forms.

#### 1.3 <u>Revision</u>

The contents of the OC Grading Manual will be periodically revised in response to new technological developments, improved understanding of engineering characteristics of earth material and other factors deemed appropriate by the Director, OC Public Works. Any person seeking to initiate a revision shall submit a written request accompanied by pertinent supportive data to the Director, OC Public Works. At such time, if the Director of OC Public Works should choose to consider a pending revision request, he shall direct an appropriate reviewing body to convene and make recommendations for changes. These recommendations shall become effective subsequent to approval by the Director, OC Public Works. Emergency situations may be handled differently insofar as other legal constraints permit. Requests of this nature shall be initiated by correspondence with the OC Building Official.

# SUBARTICLE 2. DEFINITIONS

#### 2.1 <u>Definitions</u>

The definitions contained in this subarticle are helpful in interpreting the meaning of the OC Grading Code and are fundamental to understanding the technical requirements of the OC Grading Manual.

AS-BUILT GRADING PLAN is a grading plan that is a final grading plan showing proposed grading, including proposed contouring and proposed finished elevations. An as-built grad-

ing plan is still a proposal, but is based on a more accurate field survey of key points such as property concerns and structures.

*BEDROCK* is the solid, naturally formed aggregate or mass of mineral matter, whether or not coherent, which underlies soil or is exposed where soil does not conceal it.

*BENCH* is a relatively level step excavated into earth material on which fill is to be placed (see Figure 1).

*DRAINAGE PLAN* is a plan appended to a proposed building plan that depicts site drainage patterns prior and post development. Contours and/or spot elevations, flow lines, outlet structures, subdrains, etc. must clearly be shown when a separate grading permit is not required by the OC Building Official.

*EARTH MATERIAL* is any rock, natural soil, fill, substance, or any combination thereof that makes up or originates from the Earth.

*FAULT* is a fracture in the earth's crust along which movement has occurred. A FAULT is considered active if movement has occurred within the last  $\pm$  11,000 years (Holocene Epoch, geologic time).

FLATLAND SITE is any site which does not fit the definition of a hillside site.

*HILLSIDE SITE* is a site which entails a cut and/or fill grading of three (3) feet or more in vertical height below or above natural ground; or a combination fill-over-cut slope equal to or greater than five (5) feet in vertical height; or where the existing grade is 20 percent (%) or greater; and which may be adversely affected by drainage and/or stability conditions within or from outside the site, or which may cause an adverse effect on the adjacent property.

KEY/KEYWAY is a designed, excavated trench into competent earth materials in which compacted, engineered fill is placed to resist lateral pressure.

*NPDES* is an acronym for National Pollutant Discharge Elimination System; a Federal program that controls water pollution by regulating point sources that discharge pollutants into U.S. waters. These pollutants originated from the action of erosion, sediment transport, and chemical discharge.

*RETAINING STRUCTURE* is a Wall, a Segmental Retaining Wall System (SRW) a Gabion System, or other structural devices designed to resist lateral pressure.

SEISMICITY is the susceptibility of earth materials to earthquake induced motion and surface rupture.

SLOPE STABILITY ANALYSIS is the mathematical measure of the relative factor of safety against both deep-seated and surficial failure of slope earth material. *Gross or deep-seated failure* involves either rotational or translational failure along planes or surfaces of weakness. *Surficial failure* involves the outer portion of the slope soil (normally three to four feet, measured perpendicular to the slope face) which is affected by erosion, weathering, and seepage forces.

*SULFATE* (S04) is a chemical compound occurring in some soils which, above certain levels of concentration, has a corrosive effect on ordinary Portland cement concrete and some metals.

# SUBARTICLE 3. PERMITS REQUIRED - RESERVED



# SUBARTICLE 4. ORGANIZATION AND ENFORCEMENT

• CURRENTLY ADOPTED STATE BUILDING CODES, DIVISION II, SECTION 113 REPLACED SUBARTICLE 4.

NOTE: Subarticle 4.1 and 4.2 of the Orange County Grading Manual are hereby repealed.

# SUBARTICLE 5. GRADING PERMIT REQUIREMENTS

# 5.1 Grading Permit Application

The following basic documents and fees are required to apply for a grading permit unless otherwise specified by the OC Building Official. The documents are submitted to and fees paid at the Orange County Permit Processing Center. Submit the following or submit the documents per latest OC Development Services requirements:

- a. Completed applicant's information packet for Building/Grading Permits
- b. A minimum of seven (7) sets of dated grading plans (additional copies may be required during plan check). The DPC Staff will route a copy of your plans to Zoning Plan Check. Sets will be sent to Traffic Engineering, Environmental Planning, and Subdivision as needed. The remaining copies will be used internally within the Grading Section.
- c. Three (3) copies of an initial geotechnical/soil engineering geology report if required (see Appendix B for report requirements).
- d. Three (3)copies of an initial geology report if required (see Appendix B for report requirements).
- e. Plan check fee based on the latest OC Development Services Fee Schedule.
- f. Three (3) sets of erosion, sediment, and chemical control plans (see Subarticle 13 in this Grading Manual) in compliance with current NPDES regulations and California State Water Boards.
- g. Two (2) copies of a Water Quality Management Plan (WQMP)

Additional information may be required after receiving comments from the grading inspector and after review of applicable regulations. This additional information may include, but not be limited to:

- a. One (1) copy of each soil report relevant to prior grading on the site
- b. Engineering Geology/Geology reports similar to (a) above.

- c. Other information as required by prior approval conditions. For example, the Planning Commission may require an approved landscape plan.
- d. Hydrology maps and calculations as necessary to size drainage facilities; may necessitate hydraulic calculations.

The applicant will be notified of these requirements in writing generally in the form of the Grading Plan Standards and Correction List Library (see Appendix A).

#### 5.2 Grading Plan Clearances

The OC Building Official shall notify the applicant that, prior to issuance of a grading permit, written clearance will be required from other divisions within the OC Public Works Division and may be required from other agencies. The majority of permit applications require clearances from the following divisions within the OC Public Works Division:

- a. OC Public Works/OC Development Services Planning
- b. OC Public Works/OC Traffic Engineering Programs
- c. OC Public Works/OC Environmental Planning

Depending on site conditions and location, written clearances may be required from, but not be limited to, the following County Agencies:

- a. OC Transportation, Special Districts
- b. OC Advanced Planning
- c. OC Fire Authority
- d. OC Fire Authority (Fuel Modification)
- e. OC Health Care Agency (Vector Control)

Depending on site conditions and location, written clearance or permits may be required from, but not be limited to, the following agencies:

- a. California Regional Water Quality Control Board
- b. California Department of Fish and Wildlife
- c. California Coastal Commission
- d. California Division of Industrial Safety

NOTE: Upon notification by the OC Building Official, the applicant shall be responsible for submitting copies of the required plans and information and obtaining clearances of permits from other departments/agencies prior to issuance of the grading permit.

#### 5.3 Grading Plan Check

Plans submitted for plan check shall be drawn to scale upon substantial paper and shall be of sufficient clarity to indicate the nature and extent of the grading work proposed. Plans must show in detail that they will conform to the provisions of the OC Grading Manual, the OC Grading and Excavation Code, currently adopted State Building Codes, all relevant laws, ordinances, rules and regulations.

The first sheet of each set of plans shall give the location of the grading work and the name, address and telephone number of the following: the owner, the person by whom they were prepared, the project soil engineer, the engineering geologist and, when applicable, the project paleontologist and archaeologist. Additional details may be required where necessary. No plan sheet shall exceed 36 x 42 inch dimensions.

a. Preliminary Grading Permit (Rough or Mass Grading Permit):

NOTE: THIS PERMIT WILL NOT FULFILL THE REQUIREMENTS FOR THE ISSUANCE OF A BUILDING PERMIT.

The plans shall include but not be limited to the following:

- 1. Vicinity map of the site
- Property limits clearly labeled or otherwise identified with accurate contours of existing ground, details of terrain, and area drainage a minimum of fifteen (15) feet beyond property limits or grading limits adjacent to areas of grading (spot elevations may be used on flatland sites).
- 3. Limiting dimensions including setbacks between property lines, top and toe of slopes, elevations of finish contours to be achieved by the grading, proposed drainage devices and related construction.
- 4. Details (plan and section views) of all surface and subsurface drainage devices, walls, cribbing, dams, BMP measures, and other protective devices to be constructed with, or as a part of the proposed grading work
- 5. Location of any existing building or structures on the property where the grading work is to be performed and the location of any building or structure on land of adjacent owners, which are within fifteen (15) feet of the limits of grading, or which may be adversely affected by the proposed grading operations.
- 6. If the grading project includes the movement of earth material to or from the site in an amount considered substantial by the OC Building Official, the permittee shall submit the haul route for review and approval by the OC Public Works Traffic Programs, prior to the issuance of a grading permit.

OC Public Works Traffic Programs may suggest alternate routes or special requirements in consideration of possible effects on the adjacent community environment, or on the Public Right-of-Way, which the OC Building Official shall prescribe as a condition of the grading permit.

- 7. Additional plans, drawings, calculations, environmental impact information, or other reports required by the OC Building Official.
- 8. A Grading Plan Standards and Correction Sheet Library is included in Appendix A which identifies additional items typically required on grading plans depending on site conditions.

b. Precise Grading Permit:

THE PRECISE PLANS SHALL INCLUDE THE FOLLOWING IN ADDITION TO THE ABOVE ITEMS LISTED FOR PRELIMINARY GRADING PERMIT:

- 1. The footprint or allowable building area of all proposed structures (including columns, overhangs, air conditioner pads, and architectural projections), shown in relationship to top and toe of slopes.
- 2. Detailed finished grade, finished floor elevations, and pad elevations
- 3. Flowlines for lot drainage and invert elevations for all area drains, etc.
- 4. Details for building footing and side-yard swale relationship (including extra height of depth of footing)
- 5. Proposed concrete flatwork, hardscape, and/or driveways
- 6. The Precise Grading Plan shall identify all previous preliminary grading permits issued for the project site. Sheets from the preliminary grading plan which show original topography shall be submitted with the precise grading plan.
- 7. Grading work required under a preliminary grading permit must be completed before the last increment of the site if converted to precise permit. The remaining grading work shall also be included with a precise permit.

#### 5.4 <u>Geotechnical/Soil and Engineering Geology Report Content</u>

Guidelines are provided in Appendix B, "Technical Guidelines for Geotechnical/Soil and Engineering Geology/Geology Reports."

Recommendations contained in the approved reports shall be incorporated into the grading plans and specifications and shall become conditions of the grading permit. For the purposes of this subsection, this manual considers soil engineer and geotechnical engineer to be synonymous.

a. Preliminary Soil Report:

Geotechnical/Soil engineering reports shall be required for all subdivision, commercial/industrial, multi-residential and similar developments involving structures and/or earthwork for which a grading permit is required. Geotechnical/Soil reports shall also be required for grading or building permits on single lot projects when specified by the OC Building Official.

The preliminary geotechnical/soil engineering report shall include information and data regarding the nature, distribution, and the physical and chemical properties of existing soils; opinions as to adequacy of the site for the proposed grading; recommendations for general and corrective grading procedures; foundation and pave-

ment design criteria and shall provide other recommendations, as necessary, commensurate with the project grading and development.

b. Preliminary Engineering Geology Report:

Engineering geology reports shall be required for all developments on hillside sites where geologic conditions may have a substantial effect on existing and/or future site stability. This requirement may be extended to other sites suspected of being adversely affected by faulting.

The preliminary engineering geology report shall include a comprehensive description of the site topography and geology; an opinion as to the adequacy of the proposed development from an engineering geologic standpoint; and opinion as to the extent that instability on adjacent properties may adversely affect the project; a description of the field investigation and findings; conclusions regarding the effect of geologic conditions on the proposed development; specific recommendations for plan modification, corrective grading and/or special techniques and systems to facilitate a safe and stable development, and shall provide other recommendations as necessary, commensurate with the project grading and development. The preliminary engineering geology report may be combined with the geotechnical/soil engineering report.

c. Seismicity Report/Fault Study:

Alquist-Priolo Earthquake Fault Zoning Act, Public Resources Code (PRC) §2621 et seq.

A seismicity report/ fault study shall be required as a condition for issuance of a grading permit and/or Building Permit for all subdivisions (tracts), all sites for critical structures (fire stations, nursing homes, etc.), and major structures, as determined by the OC Building Official. Additionally, sites containing earthquake sensitive earth materials and/or sites that is located on or near potentially active or active faults shall also require a seismicity/fault study report, as determined by the OC Building Official.

The report shall be prepared by a Certified Engineering Geologist, licensed in the State of California, with expertise in earthquake technology and its application to buildings and other civil engineering works. A Professional Geologist, licensed in the State of California, may also prepare a seismicity/fault study report. The Scope of the report shall be commensurate with the proposed development and shall reflect the state of the art. The seismicity report/fault study may be combined with the Geotechnical/Soil and Engineering Geology reports.

d. Seismic Hazard Report:

Seismic hazard reports shall be required to address liquefaction and earthquake induced landslide potential in accordance with the requirements of SP117A for development of sites located within the limits of State of California defined Seismic Hazard Zones (SHZ's), or as determined by the OC Building Official. SHZ reports should be prepared in accordance with the guidelines for evaluating and mitigating seismic hazards in California as presented in SP117A and the Southern California Earthquake Center (SCEC) referenced publications (1999 and 2002) included on the Additional Resources listings presented in Appendix B and Appendix F.

Seismic hazard zone (SHZ) reports may be combined with the geotechnical/soil engineering and engineering geology reports.

e. Final Reports:

Rough Grade Compaction, Final Soil, and Engineering Geology reports shall be submitted in accordance with Subarticle 15 of this OC Grading Manual.

#### 5.5 Permit Issuance

A preliminary grading permit may not be issued until after approval of a Tentative Tract or Tentative Parcel Map unless otherwise provided in zoning regulations or approved by the OC Building Official.

#### 5.6 <u>Permit Expiration</u>

The time limitations and provisions of the currently adopted State Building Codes or currently adopted County Ordinances as Amended relating to expiration of grading permits are included in Appendix C.

# SUBARTICLE 6. FEES

#### 6.1 Plan Check Fee

The amount of the plan check fees for grading plans shall be as specified by resolution of the OC Board of Supervisors, or modified by the OC Building Official (See the latest OC Development Services Fee Schedule on County of Orange Website: http://ocpublicworks.com).

#### 6.2 Grading Permit Fee

The amount of the Grading Permit Fee shall be as specified by resolution of the OC Board of Supervisors, or modified by the OC Building Official (See the latest OC Development Services Fee Ordinance Schedule on County of Orange Website: <u>http://ocpublicworks.com</u>).

#### 6.3 Grading Permit Renewal Fee

The fee for renewing an expired grading permit shall be as specified in Section 7-1-820, Issuance, Expiration, and Renewal, of the OC Grading Code, or as determined by the OC Building Official. Fees are adopted by the OC Board of Supervisors and can be found in the OC Development Services Fee Schedule published on the website: http://ocpublicworks.com.

#### 6.4 <u>Refunds</u>

Requested for refunds on balance of the deposit to be submitted to the building official for approval. Refund will be made as specified by resolution of the OC Board of Supervisors, or modified by the OC Building Official (See the latest OC Development Services Fee Schedule on County of Orange Website: http://ocpublicworks.com).

# SUBARTICLE 7. SECURITY

#### 7.1 Types of Security Bonds

The applicant may file a surety bond, a cash bond, a time certificate of deposit, or a letter of credit. The instrument and method of security will be subject to approval by the OC Build-ing Official with the concurrence of OC County Counsel, when necessary.

Examples of security forms/documents are found in Appendix D. These are updated regularly. Downloads are available on the website at http://ocpublicworks.com

# 7.2 <u>Security Amount</u>

The amount of a grading security shall be based on 30% of the cost of the project cut or fill volume, whichever is greater, and 50% of the cost of the drainage improvements and erosion, sediment, and chemical control facilities being constructed or installed under the permit; plus a 10% contingency, rounded up to the nearest \$1,000.00 dollar amount. Pavement areas (i.e. driveways, parking areas, sidewalks, etc.) controlled through the grading permit process shall be considered as drainage devices, and shall be incorporated into the cost estimate. The amount of the security may be reduced by the OC Building Official to the extent that he determines that potential hazards or the nature of the project do not justify the full amount.

The amount of the security may also be increased by the OC Building Official up to 100% of the cost of the larger of the cut or fill volume and 100% of the drainage improvements and erosion and sediment control facilities if the potential hazards or nature of the project justifies such an increased amount; plus a 10% contingency, rounded up to the nearest \$1,000.00 dollar amount. A minimum bond may be required as determined by the OC Building Official.

#### 7.3 Term and Release of Security

The term of each security shall begin upon the date of permit issuance and shall remain in effect until the completion of the work to the satisfaction of the OC Building Official. For completion of work requirements, see Subarticle 15. Security release shall be accomplished by written notification to the permittee from the OC Building Official. In the case of a preliminary permit where maintenance of erosion, sediment, and chemical control is required, this will not occur until the entire site has been converted to precise permit. A permittee may, as an alternative, obtain a new permit and security issued specifically for erosion, sediment, and chemical control purposes. If this is done, the preliminary permit security will be released upon completion of preliminary permit work and issuance of the new permit.

#### 7.4 Substitution and Reduction

A substitute security may be filed in lieu of the above-mentioned security, and the OC Building Official may accept the same if it is suitable to ensure completion of the work remaining to be performed and is in proper form and substance.

# SUBARTICLE 8. CUTS

#### 8.1 Cut Slopes

Cut slopes shall be no steeper than two (2) horizontal to one (1) vertical (2:1). In special circumstances where no evidence of previous instability exists, when recommended in the geotechnical/soil engineering or engineering geology report, and when approved by the OC Building Official, slopes may be constructed steeper than 2:1. The issuance of a grading permit for plans showing slopes steeper than 2:1 shall constitute specific approval of said slopes provided that a note to this effect is clearly shown on the plans and all such slopes are referenced in the note. In no case shall slopes steeper than 2:1 be approved if 2:1 or flatter slopes are required as a condition of approval of any project or one designated on any map approved by the OC Planning Commission, OC Subdivision Committee, or the OC Board of Supervisors without appropriate revision of said condition by the approving body. Recommendations in the geotechnical engineering and/or engineering geology report for cut slopes to be steeper than 2:1 shall be accompanied by a slope stability analysis for all slopes greater than five (5) feet in height. The geotechnical/soil engineer shall consider both gross (static and pseudostatic) and surficial stability of the slope and provide a written opinion as to the slope stability.

# SUBARTICLE 9. FILLS

#### 9.1 Fill Location

Fill slopes shall not be constructed on natural slopes steeper than two (2) horizontal to one (1) vertical (2:1) or where the fill slope toe is within twelve (12) feet measured horizontally from the top of an existing or planned cut slope outside the permit area boundary. An ex-

ception may be made in the case of slopes of minor height when recommended by the Geotechnical Consultants of Record and approved by the OC Building Official.

#### 9.2 Preparation of Ground

The ground surface shall be prepared to receive fill by removing vegetation, noncomplying fill, topsoil, and other unsuitable materials, and by scarifying to provide a bond with the new fill. Where existing slopes exceed five (5) feet in height and/or are steeper than five (5) horizontal to one (1) vertical (5:1), the ground shall be prepared by benching into competent material, as determined by the geotechnical/ soil engineer and/or engineering geologist and approved by the OC Building Official. The lowermost bench beneath the toe of a fill slope shall be a minimum ten (10) feet in width. The ground surface downgrade from the toe of fill shall be compatible with sheet flow runoff, or a paved drain shall be provided, see Figure 1.

Where fill is to be placed upgrade from a cut slope, the bench of the toe of the fill shall be at least fifteen (15) feet wide. The cut slope must be made prior to placing fill and shall meet the approval of the geotechnical/soil engineer and/or engineering geologist, as a suitable foundation for fill, see Figure 1.

Unsuitable soil shall be removed prior to placement of fill and disposed of properly.

#### 9.3 Fill Material

Detrimental amounts of organic material shall not be permitted in fills; except as outlined below, no rock or similar irreducible material with a maximum dimension greater than twelve (12) inches shall be buried or placed in fills.

The OC Building Official may permit placement of larger rock when the geotechnical/soil engineer properly devises a method of placement, continuously inspects placement, and approves the fill stability and competency. The following conditions shall also apply:

- a. Prior to issuance of the grading permit, potential rock disposal area(s) shall be delineated on the approved grading plan.
- b. In Deep Fills: rock sizes greater than twelve (12) inches in maximum dimension shall be ten (10) feet or more below final grade, measured vertically, and fifteen (15) feet measured horizontally from slope faces. This depth may be reduced upon recommendation of the Geotechnical Engineer of Record and approval of the OC Building Official providing that the permitted use of the property will not be impaired.
- c. Rocks greater than twelve (12) inches shall be placed as to be surrounded by soils; no nesting of rocks will be permitted.

#### 9.4 <u>Compaction</u>

All fills shall be compacted to a minimum of ninety (90) percent of maximum density as determined by American Society of Testing Materials (ASTM) Active Standard ASTM D1557 or equivalent, as approved by the OC Building Official. Field density shall be determined in accordance with the Active Standard ASTM D1556 (Sand Cone Method), or Active Standard ASTM 06938 (Nuclear Gauge Method) or equivalent, as approved by the OC Building Official.

Locations of field density tests shall be determined by the Geotechnical Engineer of Record or approved testing agency and shall be sufficient in both horizontal and vertical placement to provide representative testing of all fill placed. Testing in areas of a critical nature or special emphasis shall be in addition to the normal representative samplings.

#### Exemptions:

- a. Fills excepted in Section 7-1-805, Grading Permits, of the OC Grading Code and where the OC Building Official determines that compaction is not a necessary safety measure to aid in preventing saturation, settlement, slipping, or erosion.
- b. Where lower density and very high potential expansion characteristics as defined by Active Standard ASTM 04829 or equivalent, and on swell potential of cohesive soils, use Active Standard ASTM 04546 or approved equivalent; lesser compaction may be granted by the OC Building Official, upon justification and recommendation by the Geotechnical/Soil Engineer of Record.

Fill slopes shall be compacted to the finish slope face as specified above. The Geotechnical/Soil Engineer of Record shall provide specifications for the method of placement and compaction of the soil within the zone of the slope face (see Figure 1 and OC Standard Plan # 1322 for minimum details).

Sufficient maximum density determinations by test method, Active Standard ASTM D1557, or approved equivalent, shall be performed during the grading operations to verify that the maximum density curves used are representative of the material placed throughout the fill.

Placement of fill materials greater than 50 feet in thickness will require settlement monitoring. The settlement monitoring data must be submitted, reviewed and approved by the OC Building Official prior to issuance of project building permits/commencement of construction at the subject site.

#### 9.5 <u>Slope</u>

Fill slopes shall be no steeper than two (2) horizontal to one (1) vertical (2:1). In special circumstances, slopes may be constructed steeper than 2:1 where no evidence of previous instability exists, when recommended in the geotechnical engineering report (with completed Grading Code Special Request Package), and when approved by the OC Building Official. The issuance of a grading permit for plans showing slopes steeper than 2:1 shall constitute specific approval of said slopes provided that a note to this effect is clearly shown on the plans and all such slopes are referred to in the note.

In no case shall fill slopes steeper than 2:1 be approved if 2:1 or flatter slopes are required as a condition of approval of any project or are designated on any map approved by the OC Planning Commission, OC Subdivision Committee, or the OC Board of Supervisors without appropriate revision of said condition or map by the approving body.

Recommendations in the soil engineering report for fill slopes to be steeper than 2:1 shall be accompanied by a slope stability analysis for all slopes greater than five (5) feet in

height. The Geotechnical/Soil Engineer and the Certified Engineering Geologist shall consider both the gross and surficial stability of the slope and provide a written opinion of the slope stability. In addition, the Geotechnical Engineer of Record and the Certified Engineering Geologist shall recommend alternative methods of construction of compaction requirements, if necessary to obtain surficial stability.

#### 9.6 <u>Utility Line Backfill</u>

Utility line backfill beneath and adjacent to structures, beneath pavements, adjacent and parallel to the toe of a slope, or in and in sloping surfaces steeper than ten horizontal to one vertical (10:1) shall be compacted and tested in accordance with Section 9.4, Compaction, of this Subarticle. Alternately, relatively self- compacting material may be used when appropriate. The material specification and method of placement shall be recommended and inspected by the geotechnical/soil engineer and approved by the OC Building Official prior to backfilling.

Utility line backfill in areas other than those stated above need no specified placement method of compaction criterion, but shall require approval by the Geotechnical/Soil Engineer and the Certified Engineering Geologist, when necessary. The final utility line backfill report from the project Geotechnical/Soil Engineer of Record shall include a statement of opinion that the backfill is suitable for intended use.

#### SUBARTICLE 10. SETBACKS

#### 10.1 <u>Setbacks from Permit Area Boundary</u>

The tops of cut and toes of fill slopes shall be set back as far as necessary from the outer property boundaries of the permit area, including slope easements, and in accordance with Figure 2 or the latest version of the California Building Code whichever is more restrictive.

#### 10.2 Design Standards for Setbacks

The tops and the toes of cut and fill slopes shall be set back from structures as far as necessary for adequacy of foundation support and to prevent damage as a result of water runoff, erosion, or maintenance of the slopes.

Unless otherwise approved by the OC Building Official based on recommendations in the approved Geotechnical/Soil Engineering and/or Engineering Geology report on the approved grading plan, setbacks shall be no less than shown in Figure 2 or the latest version of the California Building Code whichever is more restrictive.

#### 10.3 Retaining Walls

Retaining walls may be used to reduce the required setback in accordance with Figure 2 when approved by the OC Building Official.

Retaining wall systems consisting of Segmental Retaining Wall (SRW) walls, crib walls, tieback walls, etc., may have differing setback requirements. The design civil, structural, geotechnical/soil engineers, and a certified engineering geologist, shall provide setback recommendations, approved by the OC Building Official.

Note: A SRW Design Criteria List is in Appendix H

				Figu	re 2			
	MFD MFD H d +		MFD + c + Wall A abov	credit given f	PA erceptor in or shere		Hw ti Hw ti Top of wa elevation	
	Ma	Cathooly from		Classe		Detall B-2	-Drainage	Device
H(hgt) Feet	Min. s	Setbock from	n Adjacent c	Sløpe d	•	<u>)etail B-2</u> H(hgt.)	-Drainage Max. Hw	Min. Setback
H(hgt) Feet Q<6	Min. s 3'	Setback from b 7'	n Adjacent c 3''	Sløpe d 5*	* 1"	<u>)etail B-2</u> H(hgt.) 0-6	-Drainage Max. Hw	Min. Setback 1 3°min.
H(hgt) Feet 0<6 6-14	Min. a 3'	Setback from b 7' 7'	c c 3″ H/2	Slope d S* M/2 S* ala	€ 1° H/5	H(hgt.) 0-6 6-12	-Drainage Max. Hw B <sup>x</sup> H/2	Min. Setback f B*min. H/2
H(hgt) Feet 0<6 6-14 14-30	Min. a S <sup>e</sup> S <sup>e</sup>	Setback from b 7° 7° H/2 10° max	n Adjacent c 3″ H/2 H/2	Sløpe d 5* H/2 5* min. H/2 10* max	e 1" H/5 H/5	H(hgt.) 0-6 6-12 12-30 30+	-Drainage Max. Hw B <sup>4</sup> H/2 6 <sup>4</sup>	MIn. Setback 1 B <sup>e</sup> mIn. H/2 H/2 15 <sup>e</sup>
H(hgt) Feet 0<6 6-14 14-30 30+	Min. s S <sup>e</sup> S <sup>e</sup>	Setback from 5 7° 7° H/2 10° max. 10°	n Adjacent c 3* H/2 H/2 15*	Slope d 5° M/2 5° mln. H/2 10° max. H/3 40° max.	€ 1" H/5 H/5 6"	H(hgt.) 0-6 6-12 12-30 30+	-Drainage Max. Hw 3" H/2 6" 6" Tab	Min. Setback 1 3° min. H/2 H/2 15°

Notes:

- 1. PA means permit area boundary and/or property line; MFD means manufactured surface.
- 2. Setbacks shall also comply with applicable zoning regulations and currently adopted CBC.
- Table A applies to manufactured slopes and 2:1 or steeper natural slopes. Setbacks from natural slopes flatter than 2:1 shall meet the approval of the Building Official.
- "b" may be reduced if supported by a geotechnical evaluation as approved by the Building Official. The geotechnical consultant shall address potential slope movements and its impacts.
- 5. "b" is measured from the face if the structure to the top of the slope.
- 6. "d" is measured from the lower outside edge of the footing along a horizontal line to the face of the slope. Under special circumstances, "d" may be reduced as recommended in the approved geotechnical/soil report and approved by the Building Official.
- "f" may be reduced if the slope is composed of sound material that is not likely to produce detritus and is recommended by the geotechnical/soil engineer or certified engineering geologist and approved by the building official
- "a" and "e" shall be 2" when PA coincides with arterial or local street right of way and when improved sidewalk is adjacent to right of way.
- 9. "e" shall be increased as necessary for interceptor drains.

# SUBARTICLE 11. DRAINAGE AND TERRACING

#### 11.1 Terraces

Terraces at least six (6) feet in width shall be established at no more than thirty (30) foot vertical intervals on all cut or fill slopes steeper than five (5) feet horizontal to one (1) foot vertical to control surface drainage and debris, except where only one (1) terrace is required, it shall be at approximately mid-height. If the slope is turf-covered, then terraces shall be required as above on slopes steeper than four (4) feet horizontal to one (1) foot vertical. For cut or fill slopes greater than 60 feet and up to 120 feet in vertical height, one terrace shall be 12 feet in width. Terrace widths and spacing for cut and fill slopes greater than 120 feet in vertical height shall be designed by the civil engineer and approved by the OC Building Official. Suitable access shall be provided to permit proper cleaning and maintenance whenever practical.

Swales or ditches on six (6) feet and twelve (12) feet wide terraces shall have a minimum gradient of six (6) percent and must be paved with reinforced concrete gunite, or approved equal, not less than three (3) inches in thickness. They shall have a minimum depth at the deepest point of eighteen (18) inches and a minimum paved width of five (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.

#### 11.2 <u>Subsurface Drainage</u>

Cut and fill slopes shall be provided with approved subsurface drainage as necessary for stability and protection of adjacent properties from the influence of groundwater. The design of such facilities shall be contained in the approved preliminary (initial) geotechnical/soil engineering or engineering geology report and/or shall appear on the approved grading plan pursuant to the approval of the Geotechnical/Soil Engineer of Record and/or the Certified Engineering Geologist of Record.

Subsurface drainage facilities shall be installed where natural and/or artificially introduced groundwater affects or is likely to affect the project in a potentially unstable, hazardous, or otherwise deleterious manner.

#### 11.3 Disposal

All drainage facilities shall be designed to carry runoff to the nearest point of discharge approved by the OC Building official and/or other appropriate jurisdictional authority as a safe place to deposit such water. Erosion of ground in the area of discharge shall be prevented by installation of non-erosive down drains, riprap, energy dissipaters, or other approved devices including a return of flow to a natural sheet flow condition. On private property, this discharge must be minimum of five (5) feet from the property lines or greater depending on site conditions, to reduce the concentrated flow to an acceptable non-eroding sheet flow.

Where surface waters are to be conducted or directed onto adjacent property in an unnatural manner, the OC Building Official may require the applicant, prior to issuance of a grading permit, to obtain written permission from the owner of said property, accepting the surface waters. Ground adjacent to the building foundation shall have a drainage gradient of five (5) percent and impervious surfaces shall have a drainage gradient of (2) percent within 10 feet of the structure toward approved swales and/or drainage facilities, unless otherwise waived by the OC Building Official Or per the latest adopted California Building code. The maximum drainage gradient of an earth swale shall be four (4) percent.

Grading of nearly horizontal surfaces under a preliminary grading permit shall have a sheet flow drainage gradient of two (2) percent toward approved drainage facilities. The OC Building Official may reduce this minimum gradient upon the written request of the applicant or his agent, providing the applicant demonstrates the following:

- a. Finish grades for drainage of building sites can be constructed in accordance with the requirements of this subsection without importing additional fill, and
- b. Sufficient approved swales and/or drainage facilities are constructed to prevent water from ponding on any lot within a distance equal to the height of a supporting natural slope, or cut slope, or fill slope.

Finish grades, other than above, shall conform to the following minimum drainage gradient standards:

Minimum Gradients
1.0%
1.0%
1.0%

#### 11.4 Interceptor Drains

Paved interceptor drains shall be installed along the top of all manufactured slopes where the tributary drainage area flows toward the slope and has a drainage path to the top of slope greater than forty- feet (40) measured horizontally. Interceptor drains shall be paved with a minimum of three (3) inches of reinforced concrete or gunite. They shall have a minimum depth of eighteen (18) inches and a minimum paved width of thirty-six (36) inches measured horizontally across the drain. The slope of the drain shall be approved by the OC Building Official, see OC Public Works Standard Plan # 1332 for details.

#### 11.5 <u>Pipe Specifications</u>

Pipe material specifications shall be shown on the approved plans or in the approved soil report by the civil engineer or geotechnical/soil engineer and approved by the OC Building Official. The pipe shall conform to the currently adopted OC Local Drainage Manual and Standard Specifications for Public Works Construction, unless otherwise recommended by the civil engineer or geotechnical/soil engineer and approved by the OC Building Official.

#### 11.6. Area Drain Grates

Use of grate type inlets in sumps within streets is not allowed. Grated inlets are covered by OC public Works Standard Plan 1304. The main considerations in hydraulic design of grated inlets are the geometry of the grate, width of street flooding and the flow-through areas of the openings.

Inlet grates act as a strainer, catching debris that obstructs the grate openings. However, bicycle safety design required closely spaced bars and precludes increased spacing of the bars, Following are general grae/ bicycle design criteria considerations:

- Openings shall consist of at least 50% of total area of the grate
- Grated inlets shall not be used in bicycle lanes.
- Bicycle safety cross-bars shall be provided at a maximum spacing of 9" perpendicular to direction of travel )a 24" diameter bicycle wheel will not drop down more than about 1").
- Minimum clear spacing between longitudinal bars shall be 1".
- Grates shall be cast-iron or galvanizes steel.

#### 11.7 Conduits Beneath Structures

Drainage conduits i.e. subdrain or dewatering pipes, placed beneath structures shall conform to the requirements of currently adopted California Plumbing Code (CPC). Storm water shall flow away from the building and storm drain pipes outside the building footprint shall not drain into or through the building unless otherwise approved by the OC Building Official.

#### 11.8 Pipe Installation

Pipe shall be installed in accordance with the manufacturer's recommendations and with the requirements of the currently adopted Standard Specifications for Public Works Construction unless otherwise recommended by the Civil Engineer of Record or the Geotechnical/Soil Engineer of Record and approved by the OC Building Official.

#### 11.9 <u>Hydraulic Capacity</u>

With the exception of standard terrace and down drains, drainage conveyance devices shall comply with the design criteria in the current edition of the OC Local Drainage Manual.

# SUBARTICLE 12. ASPHALT CONCRETE PAVEMENT

#### 12.1 Asphalt Concrete and Untreated Base Standards

When asphalt concrete pavement is proposed for surfacing of private parking lots, private streets or other similar use, this paving, including the tack coat, prime coat, seal coat, and base course, shall conform to the current OC Public Works special provisions for asphalt concrete and untreated base materials, unless otherwise approved by the OC Building Official.

*Exception*: The provisions of this section shall not apply when (1) another governmental agency is designated to assume the responsibility for plan check and inspection of private streets; and (2) a private asphalt concrete driveway providing access to a single residence is proposed.

Prime coat shall be placed on subgrade or untreated base when the base will be subjected to substantial construction traffic or long periods of time, before asphalt concrete is place, as determined by the soil engineer and approved by the OC Building Official.

Untreated base may require testing by an approved testing agency to ensure its compliance with the applicable specifications and special provisions when determined necessary by the OC Building Official. Tests may include but shall not be limited to the following:

- a. Sieve analysis
- b. Sand equivalent
- c. Percent of crushed particles retained by a No. 4 screen

#### 12.2 Subgrade Compaction

The top six (6) inches of the subgrade material shall be compacted to a relative compaction of 90 percent of maximum density as determined by Active ASTM Standard 01557 or approved equivalent unless otherwise recommended by the Geotechnical/Soil Engineer of Record in the preliminary geotechnical/soil report and approved by the OC Building Official.

#### 12.3 Soil Sterilization

Appropriate environmentally acceptable weed killer shall be required on subgrade if no aggregate base is used.

#### 12.4 Surface Drainage

All concentrated drainage in asphalt-paved areas shall be carried by approved concrete drainage devices.

#### 12.5 Pavement Structural Section

The project geotechnical/soil engineer or design civil engineer shall determine the pavement structural section(s) for parking lots/service roads and private streets based on: (1) soil tests of the subgrade soil(s) performed by an approved soil testing laboratory; and (2) anticipated traffic and/or loading conditions. The methods used for soil testing and pavement design shall be that currently in use by OC Public Works Division or construction of public roadways, or methods acceptable to the Building Official. Unless otherwise specified by the geotechnical/soil engineer, the relative compaction of each layer of compacted base material shall be no less than 95 percent. When private street improvement plans are required to be approved by the OC Public Works Division, the pavement structural section may be determined by the OC Public Works Division Materials Engineer. In lieu of a recommended structural section from the soil engineer or civil engineer for parking lots/service roads, the following standards may be used:

		Minimum Pavement Structural Sections
a.	Parking stall areas	3" AC/6" UB
b.	Commercial Driveways, perimeter drives and loading areas	3" AC/10" UB
C.	Industrial driveways, perimeter drives and loading area	3" AC/12" UB

#### 12.6 Driveways

Whenever access is taken from a street, alley or driveway to an off- street parking area serving 40 or less dwelling units, the driveway or other vehicular access way shall have a maximum grade of fifteen percent (+15%) or minus six percent (-6%), measured from the street, alley or driveway grade along the driveway centerline at a distance of no less than eighteen (18) feet from the street, alley or driveway right-of-way line. On a case by case basis, modifications to gradients may be granted by the OC Planning Director when physical design or topography precludes compliance.

Whenever access is taken from a street, alley or driveway to an off- street parking serving industrial, commercial or professional uses, public or community facilities, or five (5) or more dwelling units, the driveway or other vehicular access way shall have a maximum grade of a plus fifteen percent (+15%) or a minus two percent (-2%), measured from the street, alley or driveway grade along the driveway centerline for a distance of not more than eighteen (18) feet from the street, alley or driveway right-of-way line.

#### SUBARTICLE 13. EROSION, SEDIMENT, AND CHEMICAL CONTROL

#### 13.1 Information on Erosion, Sediment, and Chemical Control Plans

The plan shall include but not be limited to:

a. The name and twenty-four (24) hour telephone number (work and cell numbers) of the person responsible for performing emergency erosion, sediment, and chemical control work.

- b. The signature of the civil engineer or other qualified design professional who prepared the grading plan, and who is responsible for inspection and monitoring of the erosion, sediment, and chemical control work
- c. All desilting, erosion, and sediment protection facilities necessary to protect adjacent property from erosion and sedimentation.
- d. The streets and drainage devices shall be protected from sediment deposition and illicit discharge.
- e. The placement of gravel bags (which are required), slope planting, or other measures to control erosion and sediment from all slopes above and adjacent to roads open to the public.
- f. The plan shall indicate how access will be provided to maintain desilting facilities during wet weather and throughout the year.

#### 13.2 Approval of Erosion, Sediment, and Chemical Control Plans

Effective erosion, sediment, and chemical control shall, have taken place during the construction The determination of effectiveness shall be made by the assigned grading inspector.

# SUBARTICLE 14. GRADING INSPECTION

#### 14.1 <u>Site Inspection by the OC Building Official</u>

Prior to any grading, brushing, or clearing, there shall be a pregrading meeting held on the site. Prior to placement of curb and gutter or of pavement base material, there shall be a prepaving meeting held on the site. The permittee, or his agent, shall notify the Building Official at least two (2) working days prior to the meetings and shall be responsible for notifying all principals responsible for grading and/or paving related operations. It shall be the duty of the person doing the work authorized by a permit to notify the Building Official at least one (1) working day prior to the grading work being ready for the following inspections.

- a. Cut and fill inspection:
  - 1. Canyon Cleanout: After all brush and unsuitable material has been removed, and an acceptable base has been exposed, but before any fill is placed.
  - 2. The bench and key: After the natural ground or bedrock is exposed and prepared to receive fill, but before fill is placed.
  - 3. Overexcavation: After the area has been cut but before the fill is placed.
  - 4. Cut: After the cut is started, but before the vertical depth of the cut exceed ten (10) feet, and every ten (10) foot interval thereafter. Continuation of this

cut operation need not await the arrival of the grading inspector provided that proper notification has been made to the OC Building Official.

- 5. Fill: After the fill has started, but before the vertical height of the fill exceed ten (10) feet, and every ten (10) feet interval thereafter. Continuation of this fill operation need not await the arrival of the grading inspector provided that proper notification has been made to the OC Building Official.
- 6. For items 1 to 5, the Assigned Grading Inspector shall receive proper field memos from the Geotechnical/Soil Consultants of Record, approving the cleanouts, keyways, competent bottoms, canyon subdrains, and outlets, etc.
- b. Concrete or gunite drainage device inspection:
  - 1. Alley gutter and/or concrete device draining asphalt:
    - (a) Subgrade (prior to placement of concrete) is to be prepared and required reinforcement placed. The Design Civil Engineer of Record shall provide a field memo that line and grade is set in accordance with the approved plans.
    - (b) Concrete placement: Concrete placement need not await the arrival of the grading inspector provided proper notification has been made to the OC Building Official.
  - 2. Curb and gutter (private property):
    - (a) Subgrade (prior to placement of concrete): Subgrade is to be made; forms and reinforcement are to be placed. The Design Civil Engineer of Record shall provide a field memo that line and grade is set in accordance with the approved plans.
    - (b) Concrete Placement: Concrete placement need not await the arrival of the grading inspector provided proper notification has been made to the OC Building Official.
  - 3. Terrace drains, down drains, brow ditches, and all other paved drainage devices:
    - (a) Subgrade: Prior to placement of welded wire mesh or reinforcing steel, the Design Civil Engineer of Record, shall provide a field memo that line and grade is set in accordance with the approved plans.
    - (b) Reinforcement: Thickness control wire and reinforcing steel or welded wire mesh are to be installed but prior to placement of gunite or concrete.
    - (c) Concrete placement: Concrete placement need not await the arrival of the grading inspector provided proper notification has been made to the OC Building Official.

4. Sidewalks used as drainage devices:

Subgrade: prior to placement of concrete, subgrade is to be made and forms are to be in place with the required reinforcement. The Design Civil Engineer of Record shall provide a field memo that line and grade is set in accordance with the approved plans.

- c. Drainage device other than concrete or gunite inspection:
  - 1. Subdrains:
    - (a) After excavation but prior to placement of filter material and pipe; the subdrain pipe and filter material, shall be on-site for inspection.
    - (b) After filter material and subdrain has been placed but prior to covering with backfill.
  - 2. Storm drains and inlets:
    - (a) After placement of storm drains but prior to covering with backfill, the Design Civil Engineer of Record shall provide a field memo that line and grade is set in accordance with the approved plans.
    - (b) After placement of inlet forms but prior to placing concrete, the Design Civil Engineer of Record shall provide a field memo that line and grade is set in accordance with the approved plans.
  - 3. Earthen Swales:
    - (a) Prior to rough grading approval or lumber drop
    - (b) Prior to final grading approval
- d. Rough grade inspection:

This inspection may be called for at the completion of rough grading without the necessity of the OC Building Official having previously reviewed and approved the required reports if the grading was performed under a precise grading permit. Under normal circumstances, all subdrains and slope drains shall be in place and approved as a condition for rough grading approval.

- e. Paving inspections:
  - 1. Subgrade:

After subgrade has been established, tested, and approved by the Geotechnical/Soil Engineer of Record, or his qualified representative, the Geotechnical/Soil Engineer of Record shall provide a field memo of compaction test results. The Design Civil Engineer of Record shall provide a field memo that line and grade is set in accordance with approved plans. 2. Untreated Base:

After untreated base course has been placed, tested, and approved by the Geotechnical/Soil Engineer of Record, or his qualified representative, but prior to prime coat and asphalt placement. The Geotechnical/Soil Engineer of Record shall provide a field memo of compaction test results. The Design Civil Engineer of Record shall provide a field memo that line and grade is set in accordance with the approved plans. Material invoices may be required.

- 3. Asphalt:
  - (a) During asphalt lay down, to verify continuous inspection by the Geotechnical/Soil Engineer of Record, or his qualified representative, or a special inspector when authorized. Material invoices may be required. Asphalt placement need not await the arrival of the assigned grading inspector if proper notification has been made to the OC Building Official.
  - (b) Prior to application of seal coat, the paved surface shall be water tested to reveal any irregularities and shall be patched where required. Material invoices may be required after placement of seal coat.
- f. Final inspection:

After all work, including installation of all drainage structures and other protective devices has been completed and all written professional approvals and the required reports have been submitted. An as-built plan will be required if, in the opinion of the Building Official, the finished site significantly deviates from the approved grading plan.

- g. Siltation control facilities (are to be installed year round)
  - 1. After excavation of desilting basins but prior to fill placement, prefabricated devices are to be available on- site for inspection, (e.g. Type V Inlet, Riprap, etc.).
  - 2. After fill placement for desilting basins but prior to placement of concrete or other non-erosive materials.
  - 3. After completion of an erosion, sediment, and chemical control system in accordance with an approved erosion, sediment, and chemical control plan and the requirements of the OC Building Official

#### 14.2 Special Inspections

The responsibilities and duties of a certified special inspector as provided in the currently adopted State Building Codes, Section 1704, Special Inspections or currently adopted State Building Codes or Adopted County Codes, as Amended are included in Appendix E.

#### 14.3 Alternate Materials and Methods of Construction

- a. The provisions of this OC Grading Manual are not intended to prevent the use of any material or method of construction not specifically prescribed by the OC Grading Code or this OC Grading Manual provided any such alternate has been approved pursuant to this section and approved by the OC Building Official.
- b. The OC Building Official may approve any such alternate provided he finds that the proposed design is satisfactory and complies with the provisions of the OC Grading Code and this OC Grading Manual and that the material, method, or work offered is, for the purpose intended, at least the equivalent of that prescribed in quality, strength, effectiveness, and safety.
- c. The OC Building Official shall require that sufficient evidence or proof be submitted to substantiate any claims that may be made regarding its use.
- d. Whenever there is insufficient evidence of compliance with the provisions of this OC Grading Manual or evidence that any material or any construction does not conform to the requirements of this OC Grading Manual or in order to substantiate claims for alternate material or methods of construction, the OC Building Official may require tests as proof of compliance to be made at the expense of the owner or his agent by an approved testing agency.
- e. Test methods shall be as specified by this OC Grading Manual for the material in question. If there are no appropriate test methods specified, the OC Building Official shall approve the test procedure. Copies of the results of all such tests shall be re-tained for a period of no less than two (2) years after the acceptance of the grading.
- f. Procedure for requesting use of Alternate Materials, Methods of Construction, or Special Requests (i.e. OC Grading Code Waiver see Appendix I for details).

# SUBARTICLE 15. COMPLETION OF WORK

#### 15.1 Final Reports

Upon completion of the rough grading work and at the final completion of the grading work under the grading permit, but prior to the issuance of building permits, release of grading bonds, or issuance of a certificate of use and occupancy, the OC Building Official may require:

- a. An as-graded grading plan prepared by the Design Civil Engineer of Record, the Design Architect of Record, or other licensed California Qualified Professional, which shall include corrected original ground surface elevations if necessary, graded ground surface elevations, lot drainage patterns, manufactured slope inclination, and location of all drainage facilities and subdrains.
- b. A written approval by the Design Civil Engineer of Record approving the grading as being substantially in conformance with the approved grading plan and which specifically approves the following items as appropriate to the project and stage of grading:
  - 1. Construction of line and grade for all engineered drainage devices and retaining walls (rough and final grading)
  - 2. Staking of temporary property corners which may be at offsets for proper building location (rough grading)
  - Setting of all monuments and property boundaries in accordance with the recorded tract map (rough or final grading) and set by a licensed California Civil Engineer authorized to practice professional surveying, or by a licensed California Land Surveyor.
  - 4. Location of permanent walls or structures on property corners or property lines where monumentation is not required (final grading)
  - 5. Location and inclination of all manufactured slopes (rough and final grading)
  - 6. Construction of earthen berms and positive building pad drainage (rough and final grading).

When the approved grading plan is **not** prepared by a Licensed California Civil Engineer, or a Licensed California Architect, or another Licensed California Qualified Professional, the person who prepared the plan, shall provide written approval of the grading as being substantially in conformance with the approved grading plan.

c. A geotechnical/soil engineering report prepared by the Geotechnical/Soil Engineer of Record, including type of field testing performed, suitability of utility trench and retaining wall backfill, summaries of field and laboratory tests and other substantiating data, and comments on any changes made during grading and their effect on the recommendations made in the geotechnical/soil engineering investigation report. Each field density test shall be identified, located on a plan or map, the elevation of test and finish grade elevation shown, and the method of obtaining the in-place density described, either Active Standard ASTM D1556(Sand Cone Method), Active Standard ASTM D6938 (Nuclear Gauge Method) or equivalent, or the approved equal shall be so noted. The Geotechnical/Soil Engineer of Record shall provide a written opinion as to the adequacy of the site for the intended use, as affected by the soil engineering factors. The OC Building Official may require that the soil tests or testing be performed by an approved testing agency. A. Appendix A: Grading Plan Standards and Correction List Library

# COUNTY OF ORANGE

# GRADING PLAN STANDARDS AND CORRECTIONS LIST LIBRARY GRADING PLAN CHECK CORRECTIONS

Corrections shall be made on the tracings . If you make changes to the plan other than or in addition to what Plan Check has requested, <u>yellow highlight the changes on one set of the re-submitted plans.</u>

Applications for which no permit is issued within 180 days following the date of submittal shall expire by limitation, and shall be discarded.

Project Number: Grading Correction List Library

Submittal Date:

CBC Edition: Latest version

Plan Check Date:

Description: Grading Correction List Library

Current – 1st Plan Check

Plan Checked By:

Plan Checkers Name Here:

Firstname.lastname@ocpw.ocgove.com

714-667-8888

714-667-8885 FAX

#### **GENERAL INFORMATION**

Please provide 24-hour notice to the plan checker, prior to pulling the grading Permit. Return the original check print with corrected plans. Payment of a new plan check deposit may be required. Applications for which no permit is issued within 180 days following date of submittal shall expire by limitation, and shall be discarded.

#### SUBMITTAL, FESS, BONDS, INSURANCE, AND ISSUANCE

- Provide three (3) complete sets of corrected plans or per latest OC Development Services requirements. Provide minimum 40-scale plan for precise grading. The maximum size shall be 36"x42". All sheets shall be uniform size. Allow ten (10) day turnaround time for recheck.
- Fees are based on the currently OC Development Services- Fee Schedule available on http://ocpublicworks.com
- The amount of grading security bond will be calculated by the plan checker based on earthwork quantities (30% valuation) and drainage improvements, paving, ESC (50% valuation) added together and rounded up to the nearest thousand dollar amount. The engineer shall provide this information.
- Bond is required in the amount of \$\_\_\_\_\_. Bond may be posted in one of the following forms:
  - Surety
  - Certificate of Deposit (CD)
  - Letter of Credit
  - Cash or Cashier's Check
  - Performance Bond

Personal/Company checks cannot be accepted. County approved forms for the various types of surety are available upon request at the DPC Counter or at http://ocpublicworks.com. Please note all signatures must be notarized.

- Provide verification of contractor's Workman's Compensation Insurance. If owner is doing work and will not employ other workers, owner must sign exemption statement.
- Owner or authorized agent and/or contractor must sign the permit at the time of issuance.
- Authorized agent must have a notarized statement from the owner, authorizing the agent to act on behalf of the owner.
- The permittee and the entity providing the bond must be the same i.e., owner, developer or contractor.

# <u>General</u>

The following lists are the most common requirements for the grading plans.

1) Incomplete Plans; please resubmit completed plans. Your recheck will have a 10-working day turnaround time.

2) Show Assigned project address on the Title Sheet of plan.

2.1) The following note is to appear on the Title Sheet of every Approved Grading Plan:

"There shall be no trenches nor excavations five (5) or more in depth, into which a person is required to descend; or obtain a permit from the State of California, Division of Occupational Safety, and Health Administration (Cal/OSHA). This permit and any other safety permit shall be obtained prior to the commencement of any work."

Contact Cal/OSHA at 714-558-4451 for additional information.

3) Show site acreage and earthwork quantities on title sheet of plans:

- 3.1 Site Acreage \_\_\_\_\_ Acres
- 3.2 Disturbed Areas \_\_\_\_\_ Acres
- 3.3 Impervious Areas including pool area \_\_\_\_\_ Square Foot
- 3.4 Landscape Areas \_\_\_\_\_ Square Foot
- 3.5 Cut \_\_\_\_\_ cu. yds.
- 3.5 Overexcavation \_\_\_\_ cu. yds.
- 3.6 Fill \_\_\_\_\_ cu. yds.
- 3.7 Import \_\_\_\_\_ cu. yds.; Export \_\_\_\_\_ cu. yds.
- 3.8 Remedial \_\_\_\_\_ cu. yds.

4) Each sheet of all plan sets must be stamped and wet signed by the Civil Engineer or Architect of Record for the project.

5) Show location of all existing and proposed structures, buried tanks, wells, etc.

6) Submit an itemized summary of the unit and total cost of all drainage devices, grading, paving, erosion and sediment control devices; plus a 10% contingency and round up to the nearest whole thousand-dollar amount.

7) Show on Plans:

• 7.1 North Arrow

- 7.2 Scale
- 7.3 Grading Legend
- 7.4 Vicinity Map
- 7.5 Building Number
- 7.6 Record Tract or Parcel Map lot Numbers
- 7.7 Tentative Tract or Parcel Map Lot Numbers
- 7.8 Grading Limits and Off-Site Grading Limits (Clearly labeled)
- 7.9 Permit Limits (Clearly labeled)
- 7.10 Property Lines (Clearly labeled with P.L. symbols)
- 7.11 Tract Boundaries with Number

8) A notarized letter of "Permission to Grade Upon" from adjacent property owner(s) is required for slope encroachment or other off-site grading or work. Include off-site legal description and Assessor's Parcel Number. Permission to Grade Upon Form, download available on website: http://ocpublicworks.com.

9) Show location of retaining walls on the grading plan plus top of wall elevations, adjacent finished surface elevations, top of footing elevations, provide a cross section detail showing subdrain design, indicate drainage outlet for all retaining walls, to scale. Retaining walls are not a part of the grading permit. Submit for separate building permits; show connection of subdrain to storm drain. Note on plans.

10) Show all Cut/Fill transitions and daylight lines.

11) Show existing and proposed elevations using contours and/or spot elevations.

12) Indicate disposition of excess earth materials. A separate permit may be required. OC Traffic Engineering must approve haul routes over public roadways.

13) Add the following to the plans:

- 13.1 Grading, Erosion, Sediment, and Chemical Control Notes (see attached sheets).
- 13.2 Detail sheet for: \_\_\_\_\_\_

14) Show street width and centerline. Include cross-section detail, with street paving.

15) Show all easements with dimensions and ownerships (e.g. drainage, access, utilities, maintenance, etc.)

16) Extend existing contours or spot elevations to reflect off-site areas and identify drainage patterns, minimum fifteen (15) feet beyond property lines.
17) Planning Commission/Subdivision Committee review of grading plan(s) is required prior to issuance of grading permit.

18) Approved erosion and sediment control measures are to be installed and functional throughout the construction period. Justify design with hydrology and hydraulic calculations. Submit six (6) copies of Erosion and Sediment Control Plan (ESCP) ESCP must be available at the job site all the time.

19) Show detail on plan how finished grades meet adjoining properties.

20) Show on title sheet of plans name, address, telephone number and license number of the following:

- 20.1 Owner
- 20.2 Geotechnical/Soil Engineer
- 20.3 Architect
- 20.4 Engineering Geologist
- 20.5 Civil Engineer
- 20.6 Archaeologist
- 20.7 Paleontologist
- 20.8 Surveyor

21) Show benchmark and basis of bearing (reference based on Orange County Surveyor vertical datum and recorded map or survey, respectively). Note: Civil Engineers Authorized to Practice Land Surveying and Licensed Land Surveyors can establish Property Boundaries, set TBMs, etc.

22) Submit a Topography Survey map signed and stamped by a licensed land surveyors or a civil engineer authorized to practice land surveying.

23) Show percent grades of all driveways, at the centerline

24) Show location of septic tanks and leach lines on the grading plan. A separate plumbing permit must be obtained from the Building Permit Section.

25) Additional comments may be made after field verification, that the plans and geotechnical report accurately reflects existing conditions.

26) Attach pertaining sheet from the "Preliminary" plans to each set of "Precise" plans upon request.

27) Grading concept proposed appears to require a separate site Development Permit; verify with Current Planning at the DPC Counter. If not required, please provide name of Planner who made the determination and the date.

28) Show location of sump pump on the grading plan. Design Civil Engineer of Record shall provide the Pump Specifications, Capacity Curves, Product Brochure, etc. Required separate electrical and plumbing permits must be obtained from the Building Permits Section, prior to installation.

29) Show complete handicapped parking details, accessible routes, and landings on the plans. Clearly place a note on the approved grading plans stating all currently approved ADA minimum standards have been met.

30) Submit a Water Quality Control Plan (WQMP). See http://ocpublicworks.com for North and South Orange County WQMP requirements.

31) Complete the attached Model Water Efficient Landscape Ordinance (MWELO). Based on the provided information, a Landscape plan may be required. Grading permit will not be issued prior to receive an application for a Landscape permit.

### Drainage Improvements

32) Submittal of an Agreement for Drainage Encumbrance is required from adjacent property owner(s) for acceptance of unnatural drainage. Include legal description and Assessor's Parcel Number. Applicant must have this document recorded. Agreement Form, downloads available on the website: http://ocpublicworks.com.

33) Submit a hydrology study and hydraulic calculations for this project.

34) Show limits of Flood Plain and Finished Floor elevations.

35) Show existing off-site terrace and drainage features that could significantly affect this project.

36) Show typical detail for an earthen berm four (4) feet wide by one (1) foot high, which is required at top of all slopes.

37) Provide one (1) copy of recorded (pages) of CC&R's outlining the property owner's drainage rights and maintenance responsibilities, upon request.

38) Show location and provide complete details for all subdrain systems:

- 38.1 As recommended in the approved geotechnical/engineering geology report by \_\_\_\_\_ dated\_\_\_\_\_
- 38.2 Approved Standard Plans

39) Maximum Gradient, for Sheet Flow is 10%.

40) Minimum, Acceptable Gradients:

- 40.1 Earth 1.00%
- 40.2 Asphaltic Concrete 1.00%
- 40.3 Concrete in Earth 0.50%

- 40.4 Concrete in Asphaltic Concrete 0.25%
- 40.5 Lots Sales and Preliminary Grading 2.00%
- 40.6 Terrace drains 6.0%

41) Show plan and section details of typical lot drainage. Minimum 5% away on pervious surfaces and 2% away on impervious surfaces from the building foundation within 10 feet of the building and maximum 20% away to a swale or other approved drainage devices is required.

42) Show drainage conducted to a street, natural watercourse, or other approved location.

43) Drainage over a manufactured slope is not permitted except in approved devices.

44) Show limits of roof gutters and location of downspouts (if discharged onto A.C. paving or onto a finished grade, a Portland Concrete Cement (PCC) splash block is required with minimum dimensions of one (1) foot wide by two (2) feet long); show locations and details on the Approved Grading Plans.

45) Show details for interceptor drains (brow ditches) at top of manufactured slopes to intercept surface drainage.

46) show detail of cut off walls at inlet of all paved drains, desilting basin spillways, paved outlets, inclined riprap pads, etc.

47) Show plan and detail of velocity reducers (i.e. energy dissipaters) where drains discharges onto natural ground. If riprap is to be used, specify class, size, strength, and dimensions of cut off walls.

48) Show the approved non-erosive devices where concentrated drainage exceeds 4% gradient. Use concrete, gunite, or other approved materials.

49) Revise plans to show complete details of all drainage structures, i.e.\_\_\_\_\_

50) Show concrete device in asphalt section to carry concentrated water

51) Show detail and location of extra depth footing.

52) Show a seven (7) foot setback from top of slope to building to accommodate a graded drainage swale or five (5) feet setback when an approved drainage is used, see OC Grading Manuel Figure 2 and currently adopted State Building Codes for guidance.

53) Show flow line elevations of all swales and other drainage devices.

54) Show retaining wall subdrain detail with disposal points, flow line elevations and pipe material. Subdrain pipe shall be SCH 40 PVC, with four (4) inch minimum diameter.

55) Show typical section of driveway and pavement section. Include type of surfacing material.

56) Show typical section of hardscape. Include type of surfacing material.

## <u>Slopes</u>

57) Provide structure/slope setbacks as outlined in the OC Grading Manuel and latest version of California building Code (CBC) or California Residential Code (CRC).See check print for specific non-compliance.

58) Show detail of typical slope benching preparatory to fill placement, see OC Grading Manual Figure 1.

59) Provide a minimum six (6) feet wide terrace, with maximum interval of 30 feet measured vertically. Maximum paved width to be five (5) feet and minimum depth of 18 inches (i.e. flow line to top of paved section).

60) Provide a minimum 12 feet wide terrace if slope exceeds 60 feet in height. Lowest terrace should be 12 feet wide when only two terraces are required. When three or more are required, the midslope terrace will be 12 feet wide. Show section details on the approved grading plans.

61) For slopes steeper than 20% (5:1), elimination of terracing will require Building Official approval

62) Show a downdrain for every single run terrace drain that collects run-off from slope watershed area of 13,500 square feet.

63) Show the proposed location and fully dimensioned cross sectional detail of all buttress fills recommended by the project Geotechnical Engineer of Record and/or Certified Engineering Geologist.

64) Show top and toe of all cut and fill slopes

65) Incorporate the following hillside design criteria, or justify in writing why it does not apply to your project:

- 65.1 Slope Rounding
- 65.2 Slope Contouring at Daylight Line
- 65.3 Undulating Slopes with a Minimum of Long, Flat, Inclined Planes and Acute Angles
- 65.4 Maximum Slope Height: Type B 35 Feet, Type C 20 Feet, per the OC Subdivision Code and Manual
- 65.5 Ten (10) Feet Benches Exclusive of Drainage Facilities
- 65.6 Manufactured Cut and Fill Slopes Shall Have a Maximum Slope Ratio of 2:1 H:V

66) Submit report/calculations for the following, but not limited to: wall layout, wall profile, subdrains, geogrid pullout strengths, global stability, etc. for the proposed Mechanically Stabilized Earth (MSE) segmental retaining wall(s) see APPENDIX H of the OC Grading Manual.

### **Geotechnical**

67) Obtain approval of geotechnical and/or engineering geology reports. Reports have been forwarded for their review.

68) Show rock disposal areas on the plans and provide details as recommended by the project Geotechnical Engineer of Record.

69) Show areas of overexcavation and recompaction as recommended by the Geotechnical Engineer of Record on the site plan and sections. Show volume details as a separate item where depth exceeds 12 inches. Geotechnical Engineer of Record shall verify recommended compaction in his final report.

70) The geotechnical report recommends two (2) or more options of site development. Show which option will be used on the approved grading plans.

B. Appendix B: Technical Guidelines for Geotechnical/ Soil Engineering and Engineering Geology Reports

# **TECHNICAL GUIDELINES**

# <u>FOR</u>

### GEOTECHNICAL/SOIL ENGINEERING AND ENGINEERING GEOLOGY REPORTS

The purpose of these technical guidelines is to inform grading permit applicants and their professional consultants of the basic information looked for by the OC Public Works Department in reviewing preliminary (initial) geotechnical/soil engineering and engineering geology reports for grading permit applications and rough grade compaction reports. The guidelines presented below are minimum report requirements. Additional resources that may be useful for report research and preparation are presented at the end of Appendix B.

### DESCRIPTION:

The technical guidelines are divided into four parts to distinguish geotechnical/soil engineering and engineering geology report content for project sites to be developed by grading located within different topographic areas and with respects to geologic/geotechnical hazard zones. The more involved grading projects will encompass, but not be limited to, several parts listed below:

- 1. Flatland Grading Projects identifies the geotechnical/soil engineering report content for grading projects located within flatland areas.
- Hillside Grading Projects identifies the geotechnical/soil engineering and engineering geology report content for grading projects located within hillside areas (additive to the requirements of Part I).
- 3. Geotechnical/Geologic Hazard Zones (flatland and hillside projects) identifies the geotechnical/soil engineering and engineering geology report content for grading projects located within Seismic Hazard Zones (SHZ) for liquefaction or earthquake induced landslide potential and/or the Alquist-Priolo Earthquake Fault Zoning (AP) Act as defined by the State of California (additive to the requirements of Part I and Part II as applicable).
- 4. Rough Grade Compaction Reports identifies the geotechnical/soil engineering report content for grading permit compaction reports.

### 1. TECHNICAL GUIDELINES FOR GEOTECHNICAL/SOIL ENGINEERING REPORTS FOR FLATLAND GRADING PROJECTS

General:

- (1) Signature and GE or RCE number of the Geotechnical/Soil Engineer of Record
- (2) Job address
- (3) Location description and/or location index map with reference north arrow, scale, etc.
- (4) Description of site conditions (topography relief, vegetation, man-made features, drainage, watershed, etc.)
- (5) Proposed grading (general scope, amount, special equipment and/or methods if applicable)
- (6) Planned construction (type of structure and use, type of construction and foundation/floor system, number of stories, estimated structural loads)
- (7) Proposed grading: special grading equipment or methods needed for resistant, saturated, or other unusual materials or situations
- (8) Proposed rock disposal methods (for clasts and residuals larger than 12 inches) and disposal areas (include on geotechnical plan if disposal areas is on site with complete details)
- (9) References to publications and other reports cited

### Field Investigations:

- 1) Scope (date work done, investigative methods, sampling methods, logs of borings/test pits, elevations of borings/test pits for reference of materials and samples to finished grade or footing elevations, identify real or assume elevations)
- 2) Plan with legend showing: site limits, terrain features, man-made features, boring/test pit locations, proposed improvements (including slopes with ratios, soil limits, daylight lines, paving areas, retaining walls, earth retention systems, (e.g. segmental walls, MSE walls, etc.), retaining wall systems, subdrains, and limits of overexcavation, cleanouts, uncertified fill areas, etc.
- 3) Location of all samples taken, surface and subsurface

### Groundwater Conditions:

1) Existing and historic high groundwater, future natural and artificial groundwater seepage impacts on proposed grading/project

### Engineering/Material Characteristics, Competency, Strength and Testing:

- (1) Include all test methods used, type or condition of samples used, applicable engineering graphics and calculations, results of all tests, and locations of all test samples [Use Current ASTM Standard Test Method or approved alternative]
- (2) Unified Soil Classification of Materials
- (3) Field densities (and relative compactions where pertinent) and moisture content
- (4) Maximum density-optimum moisture parameters of proposed fill material per Active Standard ASTM D 1557 or approved equivalent
- (5) Shear strength of foundation material (drained or undrained conditions, effective stress or total stress analysis, in-situ or remolded samples must be identified)
- (6) Consolidation or settlement potential
- (7) Expansion potential analyses of foundation material (see Active Standard ASTM D4829 or approved equivalent and classify potential
- (8) Soluble sulfate content of soils in contact with concrete (test by ASTM Active Standard C1580 or approved equivalent)
- (9) Gradation/size analyses by ASTM Active Standard D422 or approved equivalent
- (10) Atterberg limit analysis and parameters by ASTM Active Standard D4318 or approved equivalent
- (11) Geophysical survey, if appropriate graphic and results
- (12) Material densities and/or penetration tests (Standard Penetration Test (SPT), Cone Penetrometer Test (CPT) or other methods of known correlation to earth material density)
- (13) Shrinkage and/or bulking factors

### Foundation Design Criteria:

- (1) Footing depth and width
- (2) Criteria for foundation material preparation

- (3) Allowable bearing values based on testing
- (4) Lateral pressures (active, passive, or at rest conditions) and coefficient of friction
- (5) Settlement total, differential and rate of settlement

Foundation Design Criteria/Special Provision for Expansive Earth Materials:

- (6) Footing design and placement criteria
- (7) Slab thickness, reinforcement; separation and expansion joints, construction joints, doweling, or ties
- (8) Bridging; grade beam specifications and recommendations, when applicable
- (9) Pre-stressed (post-tensioned) floatation slab specifications and recommendations, if this system is proposed
- (10) Exterior flatwork recommendations
- (11) Moisture barriers and/or selective grading (aggregate or sand base or other subbase)
- (12) Soil moisture measures
  - i. Treatment prior to concrete placement: "pre-placement moistening," "presoaking," or "pre-saturation"
  - ii. Drainage/irrigation controls to maintain moisture content in foundation materials (including increased positive drainage, paving, cut-off walls, sealed planters, gutters and downspouts, etc.)

Foundation Design Criteria/Additional Special Provisions:

- (13) Soluble sulfate content specifications and recommendations
- (14) Effects of adjacent loads when footings are at differing elevations
- (15) Deep foundation systems
  - iii. Allowable bearing values
  - iv. Foundation design criteria, parameters and calculation when applicable
  - v. Additional loads or potential loads caused by geologic conditions (parameters and calculations)
- (16) Engineering calculations with supporting data and applicable parameters used as a basis for recommended values. These will be needed depending on the values pre-

sented relative to the foundation materials, groundwater table, proposed improvements and imposed loads B.

### Reference:

(1) In supplemental or grading plan review reports referencing earlier reports, supply copies of those referenced reports or applicable portions as required by the Building Official. Geotechnical consultant will be required to review and sign/stamp all approved plans and/or plan revisions prior to permit issuance.

### Earthwork Conclusions and Recommendations:

Ground Preparation:

- (1) Clearing/Grubbing
- (2) Existing improvement/facility abandonment
- (3) Unsuitable material removal/overexcavation (including lateral extension of removal/overexcavation beyond edge of grading limits/improvements)

### Fill Support:

- (1) Suitability and pre-compaction of in-situ materials (describe test results and other pertinent data to be used to determine suitability)
- (2) Densification and moisture conditioning or dewatering measures (equipment, surcharge, settlement monitoring, etc.)

### Placement of Fill:

- (1) Material approval (on-site, imported)
- (2) Testing (minimum 90% relative compaction by Active Standard ASTM D1556 or approved equivalent) and frequency of field density testing by vertical intervals and/or volume of fill.
- (3) Elimination of cut/fill or other differential transitions beneath improvements

### Utility Trenches:

- (1) Backfill specifications and recommendations under structures, pavements and slopes (minimum 90% relative compaction using native materials) vs. landscape and other areas.
- (2) Provisions for approval inspections and necessary testing during and on completion of grading.

- (3) Opinion as to adequacy of site for the proposed development. (This opinion should also be summarized in the first part of the geotechnical report).
- (4) Other pertinent geotechnical information for the safe development of the site.

### Pavement Design:

Indicate area and type of pavement on geotechnical report plan.

- (1) AC Pavement Design Criteria:
- i. R-value testing: method, results, sample location(s); or provide minimum AC sections per excavation and grading code
- ii. Traffic indices or projected loading conditions
- iii. AC structural sections: parking areas, service areas, heavy vehicle areas
- iv. Untreated base compaction recommendations (minimum 95% relative compaction)
- v. Subgrade recommendations: minimum depth, compaction (minimum 90% relative compaction); special recommendations for bridging, or founding, e.g., soil cement or lime treatment, over-excavation, selective grading, etc.
- (2) Concrete Pavement Design Criteria:
- i. Minimum thickness and reinforcement
- ii. Size of poured or sawed sections; expansion joints
- iii. Untreated base specifications and recommendations
- iv. Subgrade recommendations

### Percolation/Infiltration:

Impact of proposed percolation/infiltration improvement on site conditions/proposed development must be addressed. Exploration/testing to determine site specific percolation/infiltration rates must be completed in accordance with County guidelines or approved equivalent.

## 2. TECHNICAL GUIDELINES FOR GEOTECHNICAL/SOIL ENGINEERING AND ENGI-NEERING GEOLOGY REPORTS FOR HILLSIDE GRADING PROJECTS

All guidelines listed in Part I for preliminary geotechnical/soil reports are applicable in addition to the following:

### General:

- (1) Engineering geology report with signature, seal and CEG number of the Certified Engineering Geologist of Record (generally needed depending on site conditions and proposed developments).
- (2) Source of base map with date
- (3) Engineering Geologist performing mapping (if different than signing CEG)
- (4) Geological setting including general description, index of site on portion of recent large scale geologic map (if available) and references to previous geotechnical reports (or published papers) and aerial photo data on site area.
- (5) Topographic features and relationship to site geology (outcrop distribution, slope height and angles and/or ratios, dip slopes, cliffs, faults, contacts, erosion pattern, etc.).
- (6) Site conditions: distress on existing improvements in area (expansive, soil/bedrock, settlement/subsidence, or slope creep/lateral fill extension areas).

### Field Investigations:

- (1) Geologic map showing: site geology, location of proposed keyways (with dimensions), proposed buttresses, proposed or existing subdrains, seeps or springs, etc., and be suitable for the general purpose in its size, scale and manifestation and contains an adequate legend. The map should have highlighted representative geologic data of sufficient amount and location for evaluation of: general rock or soil unit distribution, geologic structure, downslope movement features (including soil/rock creep and slope creep/lateral fill extension), groundwater conditions, subsidence/settlement features or potential, and other pertinent site characteristics.
- (2) Substantiation of any known gross differences of opinion with recently available geologic reports or published data or maps on site area.

- (1) Unit classification, general lithologic type, geologic age, origin
- (2) Unit description and characteristics (in sequence for relative age) including (but not limited to):
  - i. Composition, texture, fabric, lithification, moisture, etc.
  - ii. Pertinent engineering geologic attributes (clayey, weak, loose; alignments, fissility, planar boundaries; pervious or water-bearing parts; susceptibility to masswasting, erosion, piping, or compressibility)
  - iii. Distribution, dimensions, or occurrence (supplemental to data furnished on illustrations)
  - iv. Suitability as construction and foundation material
  - v. Effects and extent of weathering (existing and relationship to project design and future site stability, material strength, etc.)

### Geologic Structure:

- (1) Distribution of structural features including position, attitude, pattern and frequency of:
  - Fissures, joints, shears, faults and other features of discontinuity
  - Bedding, folds, and other planar features
- (2) Character of structural features including: continuity, width of zones and activity, dominant vs. subordinate, planar nature, plunge, depth, open vs. closed (degree of cementation or infilling), gouge
  - Structural or cross-sections (one or more appropriately positioned and referenced on map; especially through critical areas, slopes and slides) of suitable size and engineering scale; with labeled units, features and structures; and a geologic legend. These sections should correlate with surface and subsurface data showing representative dip components, projects, and stratigraphic/structural relationships.

### Foundation Design Criteria/Special Provisions:

- (1) Footing setback from face of slopes and other setbacks (faults, fracture zones, contacts, etc.)
- (2) Creep load for foundation design, impact of slope creep/lateral fill extension on foundation design and construction

### **Stability Features and Conditions:**

- (1) Adequate mapping, sections and description showing position, dimensions and type of existing downslope movement features including soil/rock creep, flows, falls ,slumps, slides, if any.
- (2) Activity, cause or contributing factors of downslope movement features
- (3) Recent erosion, deposition, or flooding features
- (4) Subsidence/settlement, piping, solution or other void features or conditions
- (5) Groundwater and surface drainage characteristics or features
- (6) Surface expression (past and present); permeability/porosity of near surface materials
- (7) Actual or potential aquifers or conduits, perching situations, barriers or other controls to percolation and groundwater movement and fluctuation of groundwater levels at the site.

Earthwork Conclusions and Recommendations (including slope and site stability):

- (1) Unsuitable material removal (canyon cleanout, overexcavation, etc.)
- (2) Keyways (with dimensions) and benching details for existing slopes steeper than 5:1 (H:V)
- (3) Specifications for the method or placement and compaction of soil within the zone of the slope face
- (4) Slope Stability susceptibility to mass-wasting (creep to rapid failure potential)
- (5) Favorable or unfavorable inter-relationships of fractures (joints, shears, faults or zones) to planar structures (bedding, contacts, folds, plunges, weathered zones, etc.) and to each other forming potential failure planes, veneers, masses, or blocks
- (6) Favorable or unfavorable inter-relationships of geologic structures, conditions and potential failure planes to natural and/or man-made topography forming actual or potential adverse dips and contacts, adverse fractures (jointing, shearing, faulting), adverse fold limbs or synclinal axes, adverse earth masses or blocks
- (7) Favorable or unfavorable inter-relationships of height existing or proposed slopes to present and future (weathering effects; rate, depth, etc.) strength of earth materials
- (8) Slope stability effects onto or from developed natural, or proposed slopes of adjacent properties
- (9) Statement of site stability and summary of actual and potential unstable situations relative to the proposed site configuration and necessary stabilization or remedial measures for downslope movements, erosion, groundwater or settlement/subsidence

effects. Opinion and recommendations of surficial and gross stabilities of natural and manufactured slopes.

- (10) Provisions for necessary inspections of excavations to competent material by the Certified Engineering Geologist of Record and/or Geotechnical/Soil Engineer of Record and their approval and/or testing of material competency.
- (11) Geologic feasibility of the site for the proposed development. (This opinion should also be summarized in the first part of the geotechnical report).
- (12) Slope stability analysis (dependent on slope height and ratios, strength of earth materials, internal structure, susceptibility to weathering, actual or potential groundwater, surficial covering, proximity to site improvements or structures, and proposed landscaping and maintenance).
  - Gross stability (static and pseudostatic) of natural or man-made slopes with calculations, graphics and supporting data and applicable parameters
  - Surficial stability of slopes with calculations, graphics, supporting data and applicable parameters
  - Slope stability of temporary excavations with calculations, graphics, supporting data and applicable parameters
- (13) Seismic evaluation should include regional seismicity: potential for strong shaking, ground rupture, liquefaction and earthquake induced movement/sliding; applicable parameters (peak and/or design ground acceleration, duration of strong shaking site period)and the currently adopted State Building Codes (CBC) for Earthquake Design Criteria and current edition of ASCE 7 for earthquake design

NOTE: General guidelines for slope stability analyses are provided in "Minimum Standards for Slope Stability Analysis" (Appendix F).

3. Geotechnical/Geologic Hazard Zones (flatland and hillside projects) – identifies the geotechnical/soil engineering and engineering geology report content for grading projects located within Seismic Hazard Zones (SHZ) for liquefaction or earthquake induced landslide potential and/or the Alquist-Priolo Earthquake Fault Zoning (AP) Act as defined by the State of California (additive to the requirements of Part I and Part II as applicable).

## General:

- (1) Seismic Hazard reports shall be required to address liquefaction potential in accordance with the requirements of SP117A (most current edition) for development of sites located within the limits of the State of California defined Seismic Hazard Zones (SHZ's), or as determined by the OC Building Official.
- (2) Seismic Hazard reports shall be required to address earthquake induced landslide potential in accordance with the requirements of SP117A (most current edition) for development of sites located within the limits of the State of California defined Seismic Hazard Zones (SHZ's), or as determined by the OC Building Official.
- (3) Seismicity/Fault Study reports shall be required to address the hazard of surface fault rupture in accordance with the requirements of the Alquist-Priolo Earthquake Fault Zoning (AP)Act and CGS Special Publication 42 (most current edition) for the development of sites located within State of California defined Earthquake Fault Zones (EFZ's), or as determined by the OC Building Official.

### Reference:

- (1) Seismic Hazard Reports for liquefaction and earthquake induced landslide potential shall be prepared in accordance with the guidelines for evaluating and mitigating seismic hazards as presented in SP117A (most current edition) and the Southern California Earthquake Center (SCEC) referenced publications (1999 and 2002/most current editions) included on the Additional Resources listing presented at the end of Appendix B.
- (2) Seismicity/Fault Study reports shall be prepared in accordance with the guidelines for evaluating the hazard of surface fault rupture as presented in California Geological Survey (CGS) Note 49 (most current edition) included on the Additional Resources history presented at the end of Appendix B.

# 4. TECHNICAL GUIDELIENS FOR ROUGH GRADE COMPACTION REPORTS <u>General:</u>

- (1) Signature and RCE number of Geotechnical Engineer of Record
- (2) Signature and CEG number of Certified Engineering Geologist of Record (Hillside areas only, or as determined by OC Building Official)
- (3) Job address, lot, and tract number
- (4) Grading Permit Number

## Placement of fill:

- (1) Purpose for which fill was placed
- (2) Preparation of natural grade to receive fill
- (3) Placement of fill (depth of layers, watering, etc.)
- (4) Equipment used for compaction
- (5) Method of compacting outer slope area

### Testing (Compaction):

- (1) Test procedure (field and laboratory)
- (2) Plot plan with the location of all density tests
- (3) Summary of test results:
  - Test identification number
  - Date test performed
  - Maximum dry density
  - Optimum moisture
  - Field dry density
  - Field moisture
  - Relative compaction

- Approximate elevation of test
- Approximate finish grade elevation at test site

## Testing (Utility Trench Compaction):

- (1) Location of test
- (2) Depth of trench and test
- (3) Method of backfill and compaction equipment
- (4) Summary of test results

## Testing (Other):

- (1) Summary of expansion test results (identify lots or areas with swelling potential, plot test locations on plot plan)
- (2) Summary of soluble sulfate test results
- (3) Summary of "R" value tests for asphalt concrete design where applicable

### As-Built Conditions:

- (1) Plot plan showing limits of the approved compacted fill area (approximate pad elevation, depth of fill, areas of overexcavation, canyon cleanouts, keys, and subdrains)
- (2) Treatment of "daylight" or cut/fill transition zones (extent of overexcavation outside of and below the footings)
- (3) Type of soil encountered daring grading (fill, in-situ, imported borrow)
- (4) Groundwater conditions identified and subdrains or other methods used to mitigate adverse effects
- (5) Geologic conditions encountered
- (6) Geotechnical cross-sections (as necessary)
- (7) Comments on changes made during grading and their effect on the recommendations made in the approved geotechnical report

### Recommendations:

- (1) Footing recommendations and bearing value on compacted fill
- (2) Footing and floor slab recommendations based on results of expansion and soluble sulfate tests and construction details of footings
- (3) Pavement structural section design recommendations and specifications
- (4) The suitability of natural soil to support the fill or structure
- (5) Approval as to the adequacy of the site for the intended use, as affected by soil engineering and/or engineering geologic factors
- (6) The gross (static and pseudostatic) and surficial stability of all slopes
- (7) The suitability of utility trench and retaining wall backfill
- (8) A statement that the geotechnical/soil engineering and the engineering geologic aspects of the grading have been inspected and are in compliance with the applicable conditions of the Grading Permit and the geotechnical/soil engineer's and engineering geologist's recommendations

## ADDITIONAL RESOURCES FOR PREPARATION OF GEOTECHNICAL/SOIL ENGINEERING AND ENGINEERING GEOLOGY REPORTS

THE CURRENT AND ADOPTED OC GRADING CODE ORDINANCE

THE CURRENT AND ADOPTED CALIFORNIA BUILDING CODE (CBC)

AMERICAN CONCRETE INSTITUTE, BUILDING CODE REQUIREMENTS FOR STRUCTURAL CON-CRETE (ACI 318) AND COMMENTARY

CALIFORNIA BOARD FOR PROFESSIONAL ENGINEERS, LAND SURVEYORS, AND GEOLOGISTS

CALIFORNIA DEPARTMENT OF CONVSERVATION, CALIFORNIA GEOLGICAL SURVEY,

CALIFORNIA DEPARTMENT FOR CONSERVATION, CALIFORNIA GEOLOGICAL SURVEY, FAULT-RUPTURE HAZARD ZONES IN CALIFORNIA, SPECIAL PUBLICATION 42, (INTERIM REVISION) DATED 2007

CALIFORNIA DEPARTMENT OF CONVSERVATION, CALIFORNIA GEOLGICLA SURVEY, GUIDELINES FOR EVAALUATING AND MITIGATING SEISMIC HAZARDS IN CALIFORNIA, SPECIAL PUBLICATION 117A, DATED 2008 (REVISED MARCH 2009).

CALIFORNIA DEPARTMENT OF CONVSERVATION, CALIFORNIA GEOLOGICAL SURVEY, GUIDELINES FOR EVALUATING THE HAZRD OF SURFACE FAULT RUPTURE, NOTE 49, DATED 2002

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UNITED STATES GEOLOGICAL SURVEY, PROBABILISTIC SEISMIC HAZRD ANALYSIS .

# C. APPENDIX C: Permit Expiration- Permit Issuance

Permit issuance and permit expiration would be per currently adopted State Building Codes and currently adopted County Codes amended.

Section 105.5 of Division II of Chapter 1 of the 2016 California Building Code is hereby replaced as follows:

### PERMIT EXPIRATION

Section 105.5 Expiration. Every permit issued by the Building Official under the provisions of this Code shall expire by limitation and become null and void if the building or work authorized by such permit is not commenced within one hundred eighty (180) days from the date of such permit, or if the building or work authorized by such permit is suspended or abandoned at any time after the work is commenced for a period of one hundred eighty (180) days. Before such work can be commenced or recommenced, a permit shall first be extended or re-issued.

1) Requesting extension of an unexpired permit: Any permittee holding an unexpired permit or a permit which has expired for less than 180 days may apply for an extension of time within which permittee may commence work under that permit when he/she is unable to commence or recommence work within the time required by this section for good and satisfactory reasons. The Building Official may extend the time for action by the permittee for a period not exceeding one hundred eighty (180) days upon written request by the permittee showing that circumstances beyond the control of the permittee have prevented action from being taken. Permits extended in this manner shall not be subject to new regulations adopted after issuance of the permit. Fees for time extension shall be as established by the Board of Supervisors. Fees shall not be required for first extension.

(2) Requesting re-issuance of a permit which has been expired for 180 days or more: Any permittee holding a permit which has been expired for 180 days or more may apply for reissuance of the permit subject to compliance with current regulations and payment of full plan

C-2

check and permit fees. Plans must be re-submitted for plan check. Portions of the structure which have been built under the expired permit shall not be subject to current regulations.

(3) For the purpose of permit extension, multiple permits of the same structure such as building, foundation, retaining wall, plumbing, mechanical, and electrical permits shall be considered as one permit. Extension of building permit shall include extension of ancillary permits of the same structure. Each separate permit with work completed inspected and approved entirely prior to suspension or abandonment shall not be subject to extension or re-issuance.

D. APPENDIX D: Security Forms and Related Instructions

# **C**PublicWorks



# **Grading Cash Bond**

, herein referred to as the "Principal" and This agreement is entered into between the County of Orange, or its assigns hereinafter referred to as "County", to insure the completion of grading required by Grading Permit Application No. \_\_\_\_\_\_at \_\_\_\_

NOW THEREFORE, IT IS AGREED that:

- dollars for which the Principal does herewith post a cash bond in the amount of \_\_\_\_\_\_ County acknowledges receipt.
- 2. a) If the Principal complies with all the provisions of "the Orange County Grading and Excavation Code" Article 8 of Division 1 of Title 7 of the Codified Ordinances of the County of Orange, commencing with 7-1-800 thereof, and other applicable laws and ordinances; and
  - Complies with all of the terms and conditions of the permit for excavation or fill to the satisfaction of the b) Building Official; and
  - Completes all of the work contemplated under the permit within the time limit specified in the permit, and c) any extension or extensions thereof, or completes the work to a safe condition satisfactory to the Building Official, the cash bond shall be released.
- If the Principal fails to comply with the aforementioned requirements, the Building Official may order the 3. a) work required by the permit to be completed or put in a safe condition to his satisfaction.
  - b) The cash bond shall be used as necessary to pay for the completion of this work. After completion of the work, any funds remaining in this bond shall be refunded to Principal.
  - If the cost of the work exceeds the amount of this bond, Principal hereby agrees to reimburse County for C) such excess costs.
  - Principal agrees that if County brings suit to collect for the work contemplated by this permit that the d) reasonable attorney's fees as fixed by the Court, shall be paid by the Principal.

\* NOTE: "Cash" shall be either cash or Cashier's Check. No personal checks will be accepted.

DATE: \_

Principal (Notarized Signature

ACKNOWLEDGMENT

A notary public or other officer completing this certificate verifies only the identity of the individual who signed the document to which this certificate is attached, and not the truthfulness, accuracy, or validity of that document

State of California

County of

On\_\_\_\_

before me,

(insert name and title of the officer)

, who proved to me on the basis of satisfactory

personally appeared evidence to be the person(s) whose name(s) is/are subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their authorized capacity(ies), and that by his/her/their signature(s) on the instrument the person(s), or the entity upon behalf of which the person(s) acted, executed the instrument.

I certify under PENALTY OF PERJURY under the laws of the State of California that the foregoing paragraph is true and correct.

WITNESS my hand and official seal.

Signature \_

\_ (Seal)

300 N. Flower Street, Santa Ana, CA 92703 P.O. Box 4048, Santa Ana, CA 92702-4048 Revised 10/2015

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# **Certificate of Deposit Assignment**

# **Negotiable Instruments**

I. PERFORMANCE GUARANTEES ARE:

LETTERS OF CREDIT CERTIFICATES OF DEPOSIT (CD'S)

### II. INSTRUCTIONS FOR LETTERS OF CREDIT:

a) The County of Orange is the beneficiary

b) It should have an automatic extension clause c) Must be on a local bank or institution

d) Must be accompanied by Minute Order except when accepting grading

e) Must be accompanied by notarization for signature of assignor

f) Must be accompanied by a notarization for signature of authorized officer of bank or institution

g) Amount in figures should match the amount listed in words

### III. INSTRUCTIONS FOR CERTIFICATES OF DEPOSIT:

a) The County of Orange is the beneficiary or assignee

b) Must be accompanied by a Certificate of Deposit Assignment which has to be notarized c) Must be on a local bank or institution

d) Minimum maturity date shown on certificate shall be six (6) months

e) Face of certificate needs to state funds will be automatically rolled over after maturity date

f) Amount in figures must match with amount listed in words

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# **Certificate of Deposit Assignment**

, he	reinafter called ASSIGNOR, whose address is
NAME OF APPLICANT	
ADDRESS OF APPLICANT	does hereby assign and set over to the
County of Orange as ASSIGNEE, all right, title and interest of whate account of the assignor in the	ver nature, of assignor, in and the insured evidenced by Time Certificate of Deposit
In the amount of \$	, which is delivered to Assignee herewith.
Assignor agrees that this assignment carried with it the right in the in-	surance of the account by the
	ive the right to the Assignee to redeem, collect,
and withdraw the full amount of such account at any time without not assignment is given as security for the following:	tice of the Assignor: Assignor agrees that this
Completion of Grading and On site Drainage Improvements under C	Grading Permit #
at	, and that the Assignee may,
without notice to Assignor, redeem, collect, and withdraw the account	t for the purpose of having not fulfilled
with above agreement. Assignor hereby notifies the above named	ADDDODDIATE FEDEDAL INSUD ANCE ACENCY
of the assignment	AFFROFRATE FEDERAL INSORANCE AGENCI
Dated :	
MONTH DAY YEAR	
SIGNATURE OF ASSIGNOR	
Grading Permit #:	
Grading Permit #: Certificate #:	Place Notary Seal – Assignor
Grading Permit #:Certificate #:Certificate #:Certificate #:CERT FOR NOTICE OF ASSIGNMENT Receipt is hereby acknowledged to the Assignee of written notice of Certificate identified above. We have noted in our records the Assign assignment and have retained a copy of this document. We hereby ce encumbrance, hold, claim or obligation of the above-identified account prior to the assignment to the Assignee. We agree to make to the Assignee upon request. Dated :	the Assignment to said Assignee of the account and ee's interest in said account as shown by the above ertify that we have received no notice of lien,
Grading Permit #:	the Assignment to said Assignee of the account and ee's interest in said account as shown by the above ertify that we have received no notice of lien,
Grading Permit #:	the Assignment to said Assignee of the account and ee's interest in said account as shown by the above ertify that we have received no notice of lien,
Grading Permit #:	the Assignment to said Assignee of the account and ee's interest in said account as shown by the above ertify that we have received no notice of lien, Place Notary Seal – Assignor
Grading Permit #:Certificate #:	Place Notary Seal – Assignor the Assignment to said Assignee of the account and ee's interest in said account as shown by the above ertify that we have received no notice of lien, Place Notary Seal – Assignor
Grading Permit #:Certificate #:Certificate #:	the Assignment to said Assignee of the account and ee's interest in said account as shown by the above ertify that we have received no notice of lien, Place Notary Seal – Assignor www.ocplanning.ne P:714.667.8888 I F: 714.667.8888



# **Irrevocable Letter of Credit**

#### (Bank Name and Address) Example: Wording must be as shown on Bank's letterhead

TO: COUNTY OF ORANGE OC DEVELOPMENT SERVICES P.O. BOX 4048 SANTA ANA, CALIFORNIA 92702-4048

**C**PublicWorks

DATE:	
CREDIT NO.	
AMOUNT U.S.	

Gentlemen:

At the request of <u>(the "Customer"</u>, the "Bank"\* hereby establishes in your favor an Irrevocable Letter of Credit <u>(the "Credit"</u> for a total amount of U.S. \$\_\_\_\_\_\_available by your sight draft, drawn on (the "Bank" expiring <u>date\*\*</u> unless automatically renewed as herein provided.

This Letter of Credit shall be automatically extended for additional periods of one (1) year from the present or future expiration date, unless we notify you and (the "Customer") via courier or certified mail at least one-hundred twenty (120) calendar days prior to the then expiration date that we have elected not to renew this Letter of Credit. Thirty (30) days after receipt of such notice, you may draw on this Letter of Credit by presentation of the documents mentioned herein.

This Credit is issued in connection with the obligation of the ("Customer" for grading and pertinent improvements to property located at <u>(address)</u>

within the County of Orange, California. A drawing under this Credit shall be made by you presenting to us this Letter of Credit, and a demand in writing signed by a person who has been duly authorized to sign on our behalf.

Said demand shall refer to this Credit by the above number, shall state the amount demanded and shall certify one of the following:

- a) That the customer has failed to comply with the conditions of the grading permit, after fifteen (15) days written notice to the customer demanding compliance with the conditions of said permit or,
- b) The work authorized by the above Permit has been left in a hazardous condition or,
- c) The work remains incomplete and the County of Orange has received notice that we have elected not to renew this Letter of Credit.

Upon receipt of the said documents we shall pay to you the amount stated in the said demand to be payable to you without inquiring whether you have a right to such amount as/between yourself and the customer, provided that such amount, together with other amounts paid to you under this Credit, if any, do not exceed in the aggregate amount of this Credit.

This Credit shall be terminated upon receipt of your letter certifying that the subject grading has been completed in a satisfactory manner.

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<sup>300</sup> N. Flower Street, Santa Ana, CA 92703

P.O. Box 4048, Santa Ana, CA 92702-4048 Revised 10/2015



			Bank
		Bv:	
		(Authorized Representative)	
		(Notary Signature Attached)	
* Must be a California	Bank		
** Must be at least two	(2) yea	rs from date of issuance.	
		ACKNOWLEDGEMENT	
STATE OF CALIFORNIA	}		
	}ss.		
COUNTY OF ORANGE	}		
On	_, 20	before me,,	
personally appeared of satisfactory evidence to be the to me that he/she/they execute the instrument the person(s), or	ne perso d the sa r the ent	on(s) whose name(s) is/are subscribed to the within in me in his/her/their authorized capacity(ies), and that l ity upon behalf of which the person(s) acted, execute	who proved to me on the basis istrument and acknowledged by his/her/their signature(s) on d the instrument.
Leartify under PENALTY OF PE		(under the laws of the State of California that the fore	aging paragraph is true and

I certify under PENALTY OF PERJURY under the laws of the State of California that the foregoing paragraph is true and correct.

Witness my hand and official seal.

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**D** 





# Surety Bond Form

PRINCIPAL:	
CA #:	
KNOW ALL MEN BY THESE PRESENTS:	
That we,	
of	California, as
MAILING ADDRESS OF PRINCIPAL, INCLUDING ZIP CODE	
principal, and	
a corporation, as surety, are held and firmly bound unto the County of Orange, a	municipal
corporation of the State of California in the sum of ,	
\$ , lawful money of the United States, for the payment of whic	h well and truly to
be made bind ourselves, jointly and severally, firmly by these presents.	ng ten disebut ant ten en honoresita interaction of the second second second second second second second second
Signed, sealed and dated this day of	,20
THE CONDITION OF THE ABOVE OBLIGATION IS SUCH THAT:	
WHEREAS, the said Principal above names is the applicant under Grading Permi of the County of Orange, California for grading, on the following described prope	t # rty:
Legal Address of property covered by this bond/ Legal Description:	

#### NOW THEREFORE, IT IS AGREED that if the Principal shall:

- a) Comply with all of the provisions of the Orange County Grading and Excavation Code and other applicable laws and ordinances;
- b) Comply with all terms and condition of the permit to the satisfaction of the Building Official;
- c) Complete all work contemplated under the said permit within the time limit specified in the permit, and any extensions(s) thereof; and
- d) Reimburse the County for any work required by the permit that the Building Official deems necessary to complete, correct or otherwise undertake for the public safety, because of failure on the part of the Principal, then this obligation shall be null and void; otherwise it shall remain in full force and effect.

**PROVIDED, HOWEVER**, that the said Surety, for value received, hereby stipulates and agrees that no change, extension of time, alteration or modification of the permit or the work to be performed thereunder shall in any way affect its obligation on this bond and it does hereby waive notice of any such change, extension of time, alteration or modification of the performed thereunder; and

**PROVIDED, FURTHER**, that in case suit is brought upon the bond by the County or any other person who may bring an action on this bond, a reasonable attorney's fee, to be fixed by the Court, shall be paid by the Principal or Surety.

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# Acknowledgement

It is understood that the liability of the principal and surety upon this bond is a continuing obligation and shall be in effect from the date hereof until the completion, to the satisfaction of the County of Orange of all the terms and conditions of said Grading Permit, or in the event of a change in ownership prior to the completion of the grading and the new owner selects to secure a new permit and post a new bond for the completion of the grading work, then this obligation shall be void; otherwise to remain in full force and effect.

IN WITNESS WHEREOF, the Principal and Surety have caused these presents to be duly

signed, sealed and dated this		day of , 20
(ATTACH ACKNOW LEDGEMENT)	 By:	PRINCIPAL
	By:	
	Ву	
(ATTACH ACKNOWLEDGEMENT)		SURETY
	Ву:	ATTORNEY IN-FACT
	Address:	
(This hand must h		ofono o Notone Dublic)
(This bolid must b	e acknowledged both as to principal and surety b	elote a Notary Fublicy
	FOR DEPARTMENT US	E ONLY
Permit #:	Legal description and ownership compared with the Grading Permit application and found to be	Approved as to Form
	identical.	
	By:PLAN CHECKER	, 20
Date:	Receipt #:	Attorney
		By:
		DEPUTY

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# E. APPENDIX E: Special Inspection

### SECTION 1704 SPECIAL INSTRUCTIONS

OF THE CURRENTLY ADOPTED STATE BUILDING CODES

AND CURRENTLY ADOPTED COUNTY CODES, AS AMENDED

SECTION 1704 SPECIAL INSTRUCTIONS OF THE CURRENTLY ADOPTED STATE BUILDING CODES AND CURRENTLY ADOPTED COUNTY CODES, AS AMENDED

Section 7-1-29. of the Currently adopted County Code:

SECTION 1704.2.1 AMENDED.

SPECIAL INSPECTIONS

Section 1704.2.1of the 2016 California Building Code and the 2015 International Building Code is hereby amended to add Section 1704.2.1.1 as follows:

Section 1704.2.1.1 Special Inspector. The special inspector shall be a qualified person who shall demonstrate competence, to the satisfaction of the Building Official, for inspection of the particular type of construction or operation requiring special inspection.

Each person applying for listing as a special inspector for the OC Public Works of the County of Orange shall provide evidence of experience and possess a valid Certification as a Special Inspector issued by the International Code Council (ICC) or equivalent as determined by the Building Official for each classification for which the person is applying.

A County of Orange registration card, which identifies the person as a special inspector in the appropriate category, shall be issued to each such person that has successfully completed the application and examination process as determined by the Building Official and upon payment of a registration fee as established by the Board of Supervisors.

The annual renewal of the registration cards shall occur on renewal date of ICC certification or equivalent for the classification being renewed. A renewal fee established by the Board of Supervisors for each inspection category shall be charged. The application and renewal fee shall be accompanied by appropriate evidence that the person's ICC or equivalent special inspector's certification is valid.

The Building Official may revoke any County of Orange special inspector's registration card at any time for due cause by written notice. This notice shall set forth the time and place a hearing shall be held before the Building Official at which time and place evidence would be submitted to show cause why the registration card should not be withdrawn. Failure to appear at such hearing by the special inspector may result in immediate revocation of said special inspector's registration card.

Note: The balance of Section 1704.2.4 is implemented as written.

F. APPENDIX F: Minimum Standards for Slope Stability Analysis
# MINIMUM STANDARDS FOR SLOPE STABILITY ANALYSIS

The following minimum standards for slope stability analysis will generally be required for all cut, fill and natural slopes steeper than 2:1 (H: V) and/or any gradient when the slope height exceeds 30 feet. A more detailed field and laboratory investigation combined with a seismic stability analysis utilizing such information may be required. Additional resources that may be useful for slope stability analysis are presented at the end of Appendix C.

- (1) Separate calculations shall be performed for static and seismic conditions.
- (2) The pseudo static slope stability analysis shall be the minimum seismic analysis accepted for design.
- (3) Conventional static methods of slope stability analysis based upon principles of mechanics may be used to analyze the stability of slopes under both static and pseudo static loads.
- (4) The minimum acceptable factor of safety on shear strength is 1.5 for static loads, and 1.1 for pseudo static loads. The factor of safety on strength is defined as the ratio of the shearing resistance force to the actual driving force acting along the potential failure surface.
- (5) The static analysis shall include the effect of expected maximum moisture conditions, soil weight and seepage or pore pressure where applicable. Saturated moisture conditions shall be utilized unless it can be shown that other moisture contents will represent worst possible conditions for the project.
- (6) Pseudostatic analysis shall include the effect of static loads combined with a horizontal inertial force acting out of the slope and through the center of gravity of the potential sliding mass.
- (7) Slope stability analysis should be performed in accordance with SP117A where applicable. Liquefaction related impacts on slope stability (e.g. reduced strength of supporting soils, lateral spreading, etc.) shall be accounted for as necessary based on site specific conditions.
- (8) The appropriate critical potential failure surface (e.g. circular or block-type failure) used in the analysis must be determined based on the site specific geologic conditions. Wedge failure analysis for permanent cut slopes exposing adverse bedrock conditions should be provided when applicable. In cohesive soils, a vertical tension crack extending down from the top of the slope to the potential failure surface may be used to limit the lateral extent of the potential sliding mass.
- (9) The critical potential failure surface having the lowest factor of safety on strength shall be sought for the static case. This same static surface and sliding mass may be assumed critical for the pseudo static case.

- (10) Soil properties including unit weight and strength parameters (cohesion and internal friction angle) maybe based on conventional field and laboratory tests and/or field performance. Where appropriate, laboratory tests for long-term residual strengths shall be performed. Shear resistance along bedding planes normally requires estimation of bedding-strength value of the weakest unsupported plane. It is expected that the engineer and engineering geologist will use considerable judgment in the selection of appropriate shear test and interpretation of the results in arriving at strength characteristics fitting the present and anticipated future slope conditions. Dynamic strengths used in a pseudo static analysis shall not exceed peak point static strengths, unless supported by dynamic test results or other convincing physical evidence.
- (11) Each slope stability analysis shall be accompanied by a geotechnical report including a summary of the results of field exploration and laboratory investigation. This report should minimally include the following items:
  - a) Boring logs and plan locations relative to the proposed grading.
  - b) Geotechnical description of soil and/or bedrock encountered in the proposed cut slope and/or expected to be used in the proposed fill. Soil description should include engineering classification with moisture and density of stiffness. Rock description should include, but not be limited to: engineering geologic assessment of hardness, degree of weathering, strata thickness, clay surfaces, and oriented planar discontinuities such as strike and dip of bedding, joint spacing, joint thickness, fracture and fault surfaces based on input from the project engineering geologist.
  - c) Geotechnical cross-sections depicting the critical failure surface and geotechnical data utilized for slope stability analysis.
  - d) Groundwater conditions encountered at the site as well as anticipated future groundwater conditions that may affect the design.
  - e) Description of laboratory tests performed with summary of laboratory test results. Both the moisture and drainage conditions during any shear strength tests should be clearly defined.
  - f) Shear strength parameters for design which are based on field experience should be properly referenced or explained.
- (12) All design parameters shall be verified during construction. This includes applicable geologic structures such as bedding attitudes, joint orientation and existing shear surface-fill strength, and groundwater conditions. If any significant variation from the design values is discovered, revised calculations shall be made and submitted, to the building official for review and approval.

- (13) Surficial stability calculations shall be performed for fill or natural slopes steeper than 2:1 (H:V), any gradient slope greater than 30 feet in height, or when necessary due to the height or geologic conditions.
- (14) Surficial stability calculations shall be performed under saturated conditions. Calculations shall be based on infinite-slope failure model analysis with seepage parallel to the slope surface or another failure mode results in the lowest factor of safety
- (15) The minimum vertical depth of material saturation for surficial stability analysis shall be 4 feet, unless determined otherwise by site specific data.
- (16) Surficial slope stability analysis shall utilized residual shear strength parameters (cohesion and friction) angle. Parameters must be representative of the surficial slope materials.
- (17) The minimum acceptable factor of safety for surficial stability is 1.5.
- (18) Surficial stability analysis resulting in factors of safety less than 1.5 shall be considered subject to debris flow hazard and will require appropriate mitigation measures be provided and shown on the approved project plans. Proposed debris impact or diversion walls/structures included as a part of any mitigation recommendations must be designed for a minimum of 125 pcf equivalent fluid pressure.
- (19) Slope stability analysis shall be performed for temporary excavations and utilize static shear strength parameters. Peak shear strength parameters may be utilized for temporary excavation stability analysis when justified due to very short duration, no potential impact to adjacent properties/existing improvements or other special circumstances.
- (20) The minimum acceptable factor of safety for temporary excavation slope stability is 1.25.
- (21) Slope stability analysis is required for all basins. Basins designed with interior slopes steeper than 3:1 (H:V) and include outlet structures shall also include slope stability analysis for rapid drawdown condition. The minimum factor of safety for the rapid drawdown condition is 1.5.

ADDITIONAL RESOURCES FOR SLOPE STABILITY ANALYSIS

- THE CURRENT AND ADOPTED OC GRADING CODE ORDINANCE
- THE CURRENT AND ADOPTED CALIFORNIA BUILDING CODE (CBC)
- CALIFORNIA DEPARTMENT OF CONVSERVATION, CALIFORNIA GEOLGICAL SURVEY,
- CALIFORNIA DEPARTMENT OF CONVSERVATION, CALIFORNIA GEOLGICLA SURVEY, GUIDELINES FOR EVAALUATING AND MITIGATING SEISMIC HAZARDS IN CALIFORNIA, SPECIAL PUBLICATION 117A, DATED 2008 (REVISED MARCH 2009).
- SOUTHERN CALIFONRIA EARTHQUAKE CENTER (SCEC), RECOMMENDED PROCE-DURES FOR IMPLEMENTATION OF DMG SPECIAL PUBLICATION 117 GUIDELINES FOR ANALYZING AND MITIGATING LANDSLIDE HAZRDS IN CALIFORNIA, DATED JUNE 2002.

G. APPENDIX G: Protection of Adjacent Property

CALIFORNIA CIVIL CODE-SECTION 832

# **OC PUBLIC WORKS**

### California Civil Code, Section 832

Lateral and subjacent support; excavations; degree of care; damages; protection of other structures.

Each coterminous owner is entitled to the lateral and subjacent support which his land receives from the adjoining land, subject to the right of the owner of the adjoining land to make proper and usual excavations on the same for purposes of construction or improvement, under the following conditions:

- (1) Any owner of land or his lessee intending to make or to permit an excavation shall give reasonable notice to the owner or owners of adjoining lands and of buildings or other structures, stating the depth to which such excavation is intended to be made, and when the excavating will begin
- (2) In making any excavation, ordinary care and skill shall be used, and reasonable precautions taken to sustain the adjoining land as such, without regard to any building or other structure which may be thereon, and there shall be no liability for damage done to any such building or other structure by reason of the excavation, except as otherwise provided or allowed by law.
- (3) If at any time it appears that the excavation is to be of a greater depth than are the walls or foundations of any adjoining building or other structure, and is to be so close as to endanger the building or other structure in any way, then the owner of the building or other structure must be allowed at least 30 days if he so desires, in which to take measures to protect the same from any damage, or in which to extend the foundations thereof, and he must be given for the same purposes reasonable license to enter on the land on which the excavation is to be or is being made.
- (4) If the excavation is intended to be or is deeper than the standard depth of foundations, which depth is defined to be a depth of \* \* \* <u>nine</u> (9) feet below the adjacent curb level, at the point where the joint property line intersects the curb and if on the land of the co-terminous owner there is any building or other structure of the wall or foundation of which goes to standard depth or deeper than the owner of the land on which the excavation is being made shall, if given the necessary license to enter on the adjoining land, protect the said adjoining land and any such building or other structure thereon without cost to the owner of such property for any such damage, excepting only for minor settlement cracks in buildings or other structures.

H. APPENDIX H: Segmental Retaining Walls (SRW) Design Criteria

# **County of Orange**

# OC Public Works - OC Development Services 300 North Flower Street- P.O. Box 4048 Santa Ana, California 92702-4048

# SEGMENTAL RETAINING WALLS (SRW) DESIGN CRITERIA

The Civil Engineer of Record must provide a signed and stamped letter to the district grading inspector stating that he/she will inspect and monitor construction of the segmental retaining wall system, and shall provide a final line and grade certification upon completion. Information required by the OC Building Official for grading plan check reviews, of proposed SRW systems are listed below, but not limited to the following:

# (1) Provide design calculations for the SRW system:

Calculations shall include an analysis of internal and external stability under both seismic and static conditions. Design shall also establish adequate factors of safety against sliding, overturning, bearing capacity, global stability (for external stability) and tensile over-stressing, pullout, and connection over-stressing (for internal stability).

# (2) The Approved Grading Plan shall include:

- A detailed critical cross section of the SRW system, [see items listed in # 4 below]
- Plan view (with designated stationing) and Profile of the proposed SRW system
- Design shall include any impact of groundwater on the proposed SRW system

### (3) Provide typical drawings to scale including:

- SRW system geometry and any surcharge(s)
- Soil type, soil properties, select import, retained soil, etc.
- Type of block facing proposed, block geometry, block weights, pins, tiebacks, etc
- Facing blocks must be approved by an approved listing agency (e.g. www.icces.org) and by the OC Building Official
- Geogrid reinforcement used, i.e. type of geogrids manufactured, with long-term design strength, Geogrid layout with overlaps, show Geogrid elevations, lengths, layers, etc.
- County of Orange uses an additional factor of safety of 1.5 over the manufacturers design
- Include any additional assumptions used in your SRW system design

# (4) Provide drainage for the SRW system against erosion and hydrostatic pressure:

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Show on the Approved Grading Plan a drainage system including:

- V-ditch at the top of the SRW, [creating a low point at the top of SRW is not recommended],
- shall be designed in a manner where runoff discharges at the ends of the SRW system
- Drainage pipe and filter materials behind the SRW (within the reinforced soil), shall conform to the OC Grading Code and the OC Grading Manual
- Drainage pipe behind the reinforced soil zone (i.e. at the heel) shall connect to an approved outlet structure or an on-site storm drain system with appropriate hydraulic head
- Call out on the approved grading plan, any restricted use or non-structural area(s),
  include an Influence Line in plan view

# I. APPENDIX I Alternative Materials and Method of Construction

• PROCEDURE FOR USE OF ALTERNATE MATERIALS, METHODS OF CONSTRUCTION, AND PROCESSING SPECIAL REQUESTS PER THE CURRENTLY ADOPTED CALIFORNIA BUILDING CODES AND THE ATTACHED OC PROCESSING SPECIAL REQUESTS CHECK-LIST

• FROM THE CURRENTLY ADOPTED CALIFORNIA BUILDING CODES:

CBC Chapter 104.11 "Alternative materials, design, and methods of construction, and equipment. The provisions of this code are not intended to prevent the installation of any material or to prohibit any design or method of construction not specifically prescribed by this code, provided that any such alternative has been approved. An alternative material, design or method of construction shall be approved where the building official finds that the proposed design is satisfactory and complies with the intent of the provisions of this code, and that the material, method or work offered is, for the purpose intended, at least the equivalent of that prescribed in this code in quality, strength, effectiveness, fire resistance, durability and safety."

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### ORANGE COUNTY PROCESSING SPECIAL REQUESTS CHECKLIST

### **PURPOSE:**

To provide staff with guidelines for processing of special requests that an applicant may make relative to the development their property when extraordinary situations/conditions exist

### **AUTHORITY:**

Section 7-1-810 of the County of Orange Grading and Excavation Code identifies the powers and duties of the OC Building Official.

### **DEFINITION:**

The County of Orange Grading and Excavation Code contains provisions which allow the OC Building Official to approve special requests for unusual grading/construction cases where extraordinary situations exist.

### AREAS WHERE SPECIAL REQUESTS ARE APPLICABLE:

The following is a list of areas where application for special requests may be made under extraordinary situations as identified in the County of Orange Grading and Excavation Code and OC Grading Manual. When processing a special request, please refer to the applicable Sections of the Code and Manual.

	<u>Code</u>	Manual
Cuts	Sec. 7-1-830	Sec. 8.1
Fills	Sec. 7-1-831	Sec. 9.1 to 9.6
Setbacks	Sec. 7-1-832	Sec. 10.1 to 10.3
Drainage and Terracing	Sec. 7-1-833	Sec. 11.1 to 11.7

Use applicable sections of the currently adopted California Building Code (CBC) where they are more conservative than the OC Grading Code Ordinance and the OC Grading Manual.

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# **PROCEDURE:**

The applicant submits a letter to the OC Building Official to petition for approval of a special request for the development of a property, relative to the above-identified Section of the OC Grading Code and OC Grading Manual and/or the currently adopted CBC. The letter must contain the following information:

1. The nature of the request must be clearly described in the letter. It must also contain the special circumstances and/or conditions that exist which warrant the request.

2. The actual limits/extent of the areas involved in the request must be designated on a plan drawn to an appropriate scale (actual grading plan should be utilized whenever possible). Cross-sections must be included where applicable to demonstrate the relationship between the request, the proposed development, and site conditions as well as any impact upon adjacent property/structures.

3. Appropriate documentation must be provided to show that the property owner has reviewed and is in agreement with the special request.

4. The geotechnical consultant of record must review and comment upon the geotechnical aspects of the special request. He must provide data and mitigate measurers to support/justify those portions of the request that are within his purview. The inclusion of a statement of his opinion alone will <u>not</u> be sufficient. If the special request has no impact upon the geotechnical aspect of the subject site and/or adjacent property, the consultant of record must so state. The Geotechnical Engineer and Engineering Geologist must recommend the approval of the wavier.

5. The initial submittal of the special request package must be made to the OC Building Official. He/she may be reached at (714) 667-8888, should you have any questions.

6. The Grading Inspector assigned to the area in question will review the special request package. Depending upon the nature of the request, comments may be solicited from the Grading Plan Check Unit, Grading Inspection Unit, Geotechnical Unit, and/or other agencies within the County, which may have jurisdiction over the area or adjacent areas impacted by the special request.

7. The special request package along with any additional data required by the initial review, and comments made by the individual reviewers, will be submitted to the OC Building Official for this evaluation.

8. The applicant will be notified by the OC Building Official in writing of the acceptance or rejection of the special request.

J. APPENDIX J: Orange County Work Completion Agreement

#### COUNTY OF ORANGE

#### OC PUBLIC WORKS

#### WORK COMPLETION AGREEMENT

This agreement is entered into between:

(Project Owner/Developer)

(Address)

Herein referred to as "Principal" and the County of Orange, or its assignee, hereinafter referred to as "County," to ensure full completion of the requirements set forth by improvement plans for the property also known as:

Whereas, Principal desires release of use and occupancy on remaining units; and Whereas, the estimated cost to complete the remaining work authorized by the above tract improvement plan(s) is \$

Now, therefore, in consideration of County's release for use and occupancy all remaining units, it is agreed that:

1. At sole cost and expense of Principal, the Principal shall construct and install all improvements shown and delineated on above-mentioned plans in compliance with the Orange County Subdivision Code and the Subdivision Map Act.

2. Principal shall furnish to County herewith Surety Bonds, Irrevocable Letter of Credit, Money, or Negotiable Bonds in the sum of <u>\$</u>\_\_\_\_\_\_\_ to assure the installation of improvements and to pay all labor and material charges, and provide maintenance in connection therewith, in compliance with the Orange County Subdivision Code and the Subdivision Map Act.

- 3. If the Principal complies with all the provisions of the above Tract Improvement Plans and other applicable regulations and special conditions of the County of Orange relative to the required work within \_\_\_\_\_\_ days of this agreement and to the satisfaction of the OC Building Official and/or his/her designee, then the said financial assurance shall be released to the Principal.
- 4. If the Principal fails to comply with the aforementioned requirements, the OC Building Official and/or his/her designee, may order the work required by the above mentioned tract improvement plans to be completed or put in a condition acceptable to the OC Building Official and/or his/her designee.
- 5. In this event, the posted financial assurance shall be used as necessary to pay for the completion of this work. After completion of the work, any funds remaining shall be refunded to the Principal.
- 6. If the cost of work exceeds the amount of this financial assurance, the Principal hereby agrees to reimburse County for such excess costs.
- 7. The Principal further agrees that, if County brings suit to collect for any additional funds to complete the work required by the above mentioned tract improvement plans that reasonable attorney fees, as fixed by the courts, shall be paid by the Principal.

Authorized Agent

(Date)

(Date)

OC Building Official

NOTE: Signature of the Authorized Agent shall be notarized

# K. APPENDIX K: Approved Grading Notes

NOTE: Approved Grading Notes (All 58) Shall Be Placed On the Title Sheet of the Approved Grading Plan.

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#### Circled notes must be shown as worded, on the full-sized sheet of the grading plan.

- 1. All work shall be in accordance with the Grading Code of the County of Orange, and any special requirements of the permit. A copy of the OC Grading Code and OC Grading Manual shall be retained on the job site while work is in progress. When referenced on the grading plans, a copy of OC Public Works Standard Plans shall also be retained on the site.
- 2. Grading shall not be started without first notifying the assigned OC Grading Inspector. A pregrading meeting on the site is required before start of grading with the following people present: Owner, Grading Contractor, Design Civil Engineer, Soil Engineer, Engineering Geologist, OC Grading Inspector, and when required, the Archaeologist, Paleontologist, and Surveyor. The required inspections for grading will be explained at the meeting.
- 3. Issuance of a grading permit does not eliminate the need for permits from other agencies with regulatory responsibilities for construction activities associated with the work authorized on this plan.
- The Grading Permit and an approved copy of the approved Grading Plan shall be on the permitted site while grading work is in progress.
- 5. Preliminary soil and geology reports, and all subsequent reports as approved by OC Development Services, are considered a part of the approved grading plan.
- 6. The Soil Engineer and Engineering Geologist shall perform sufficient inspections and be available during grading and construction to verify compliance with the plans, specifications and the OC Grading Code within their purview.
- 7. The Civil Engineer shall be available during grading to verify compliance with the plans, specifications, OC Grading Code, and any special conditions of the permit within their purview.
- 8. The Soil Engineer and Engineering Geologist shall, after clearing and prior to placement of fill in canyons, inspect each canyon for areas of adverse stability, and to determine the presence or absence of subsurface water or spring flow. If needed, subdrains will be designed and constructed prior to the placement of fill in each respective canyon.
- 9. Subdrain outlets shall be completed at the beginning of the subdrain construction.

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- The exact location of the subdrains shall be surveyed in the field for line/grade and shown on asgraded or revised plans.
- 11. Areas to receive fill shall be properly prepared and approved in writing by the Soil Engineer and the OC Building Official prior to placing fill.
- 12. Fills shall be benched into competent material per OC Public Works Standard Plan No 1322.
- 13. All existing fills shall be approved by the OC Building Official or removed prior to placing additional fills.
- 14. Fills shall be compacted throughout to a minimum of 90% relative compaction. Aggregate base for asphaltic areas shall be compacted to a minimum of 95% relative compaction. Maximum density shall be determined by ASTM D1557 or approved equivalent and filed density by ASTM D1556 (Sand-Cone) and ASTM D6938 (Nuclear Gauge Method) or an approved equivalent.
- 15. Cut and fill slopes shall be no steeper than 2-feet horizontal to 1-foot vertical (2:1) except where specifically approved by the OC Building Official.
- 16. All cut slopes shall be investigated both during and after grading by the Engineering Geologist to determine if any slope stability problems exist. Should excavation disclose any geological hazards or potential geological hazards, the Engineering Geologist shall submit recommended treatment to the OC Building Official for approval.
- 17. Where support or buttressing of cut and natural slopes is determined necessary by the Engineering Geologist and Soil Engineer, the Soil Engineer shall submit design, locations and calculations to the OC Building Official prior to construction. The Engineering Geologist and Soil Engineer shall inspect and control the construction of the buttressing and certify to the stability of the slope and adjacent structures upon completion.
- 18. When cut pads are brought to near grade, the Engineering Geologist shall determine if the bedrock is extensively fractured or faulted, and will readily transmit water. If considered necessary by the Engineering Geologist and Soil Engineer, a compacted fill blanket will be placed.
- 19. All trench backfill shall be tested and approved by the Soil Engineer per the OC Grading Code.

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- 20. Any existing irrigation lines and cisterns shall be removed or crushed in place and approved by the OC Building Official and the Soil Engineer.
- 21. Any existing water wells shall be abandoned in compliance with the specifications approved by Orange County Health Care Agency and Division of Environmental Health.
- 22. Any existing cesspools and septic tanks shall be abandoned in compliance with the California Plumbing Code to the approval of OC Building Official.
- 23. The stockpiling of excess material shall be approved by the OC Building Official prior to excavation.
- 24. Export soil must be transported to a legal dump or to a permitted site approved by the OC Building Official or his/ her designee.
- 25. The permittee shall comply with the OC Grading Code requirements for haul routes when an excess of 5,000 cubic yards of earth is transported to or from a permitted site on public roadways.
- 26. The permittee is responsible for dust control measures.
- 27. The permittee shall give reasonable notice to the owner of adjoining lands and building prior to beginning excavations which may affect the lateral and subjacent support of the adjoining property. The notice shall state the intended depth of the excavation and when the excavation will commence. The adjoining owner shall be allowed at least 30 days and reasonable access on the permitted property to protect his structure, if he so desires, unless otherwise protected by law.
- All concrete structures that are exposed to the on-site soils shall be constructed with Type V cement, unless deemed unnecessary by soluble sulfate-content tests conducted by the Soil Engineer.
- 29. Slopes exceeding 5 feet in height shall be planted with an approved plant material. In addition, slopes exceeding 15 feet in height shall be provided with an approved irrigation system, unless otherwise approved by the OC Building Official.
- 30. All existing drainage courses through this site shall remain open until facilities to handle storm water are approved and functional, however, in any case, the permittee shall be held liable for any damage due to obstructing natural drainage patterns.
- 31. Sanitary facilities shall be maintained on site.

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- 32. The location and protection of all utilities is the responsibility of the permittee.
- Approved protective measures and temporary drainage provisions shall be used to protect adjoining properties during grading.
- 34. Grading operations including maintenance of equipment within one-mile of a human occupancy shall not be conducted between the hours of 8:00 p.m. and 7:00 a.m. daily, on Sundays, or on a Federal Holiday.
  - a) All construction vehicles or equipment, fixed or mobile, operated within 1000 feet of a dwelling shall be equipped with properly operational and maintained mufflers.
  - b) All operations shall comply with Orange County Codified Ordinance Division 6 (Noise Control).
  - c) Stockpiling and/or vehicle staging areas shall be located as far as practical from dwellings and within the limits of the grading permit.
- 35. Grading and excavation shall be halted during periods of high winds. According to AQMD Rule 403, high wind conditions means instantaneous wind speeds exceed 25 MPH. This level occurs only under extreme conditions such as Santa Ana Wind conditions.
- 36. Asphalt sections must be per OC Grading Code: Parking stall 3" A/C over 6" A/B, Drives 3" A/C over 10" (Commercial), and 12" (Industrial). Or: Prior to rough grade release for Building Permits by the assigned Grading Inspector; the Soil Engineer shall submit for approval pavement section recommendations, based on "R" value analysis of the sub-grade soils, and expected traffic indices.
- Asphalt concrete shall be constructed per the requirements of OC Public Works Standard Plan No.1805.
- Aggregate base section shall be constructed per the requirements of OC Public Works Standard Plan No. 1804.
- Roof gutters shall be installed to prevent roof drainage from falling on manufactured slopes, with appropriate down spouts and outlets.
- 40. The Civil Engineer, as a condition of rough grade approval, shall provide a blue top with accompanying witness stake, set at the center of each pad reflecting the pad elevation for precise

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permits, and a blue top with witness stake set at the drainage swale high-point reflecting the high point elevation for Preliminary Permits.

- 41. Prior to final approval, the Civil Engineer shall certify to the OC Building Official the amount of earth moved during the grading operation.
- 42. The Engineering Geologist shall perform periodic inspections and submit a complete report and map upon completion of the rough grading.
- 43. The Grading Contractor shall submit a statement of compliance to the assigned Grading Inspector that the grading is in accordance with the approved Grading Plan prior to final approval.
- 44. The compaction report and approval from the Soil Engineer shall indicate the type of field testing performed. The method of obtaining the in-place density shall be identified whether sand cone, drive ring or nuclear, and shall be noted for each test. Sufficient maximum density determinations shall be performed to verify accuracy of the maximum density curves used by the Field Technician.
- 45. In the event that soil contamination is discovered during excavation and removal of an existing tank, work shall be stopped until a site assessment and mitigation plan has been prepared, submitted and approved by the OC Health Care Agency/Environmental Health and OC Development Services.

#### EROSION CONTROL

46.	In the case of emergency (24-Hour/Day), call		at
	Work Telephone #.	or Home Telephone #	

- 47. Equipment and workers for emergency work shall be made available at all times during the rainy season. Necessary materials shall be available on site and stockpiled at convenient locations to facilitate rapid construction of temporary devices when rain is imminent.
- 48. Erosion, sediment and chemical control devices shall not be moved or modified without the approval of the OC Building Official.
- All removable erosion protective devices shall be in place at the end of each working day when the 5-Day Rain Probability Forecast exceeds 40%,
- 50. After a rainstorm, all silt and debris shall be removed from streets, check berms and basins.

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- 51. Graded areas of the permitted area perimeter must drain away from the face of slopes at the conclusion of each working day. Drainage is to be directed towards desilting facilities.
- 52. The permittee and contractor shall be responsible and shall take necessary precautions to prevent public trespass onto areas where impounded water creates a hazardous condition.
- 53. The permittee and contractor shall inspect the erosion control work and insure that the work is in accordance with the approved plan.

#### ENVIRONMENTAL NOTES

- 54. The permittee shall notify all general contractors, subcontractors, material suppliers, lessees and property owners that dumping of chemicals into the storm drain system or the watershed is prohibited.
- 55. Permittee shall maintain construction site in a condition that an anticipated storm does not carry wastes or pollutants off the site. Potential pollutants include but are not limited to: solid or liquid chemical spills, wastes from paint, stains, sealants, glues, limes, pesticides herbicides, wood preservatives and solvents; asbestos fibers, paint flakes or stucco fragments; fuels, oils, lubricants, and hydraulic, radiator or battery fluids; fertilizers, vehicle/equipment wash water and concrete wash water; concrete, detergent or floatable wastes; wastes from any engine/equipment steam cleaning or chemical degreasing and super chlorinated potable water line flushing.

During construction, permittee shall dispose of such materials in a specified and controlled temporary area on-site, physically separated from potential storm water runoff, with ultimate disposal in accordance with local, state and federal requirements.

- 56. Permittee may discharge material other than storm water only when necessary for performance and completion of construction practices and where they do not: cause or contribute to a violation of any water quality standard; cause or threaten to cause pollution, contamination or nuisance; or contain a hazardous substance in a quantity reportable under Federal Regulation 40 CFR, Parts 117 and 302.
- 57. Dewatering of contaminated groundwater or discharging contaminated soils via surface erosion is prohibited. Dewatering of non-contaminated groundwater requires a National Pollutant Discharge Elimination System Permit from the respective State Regional Water Quality Control Board.

#### 58. SPECIAL NOTE:

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"Survey monuments shall be preserved and referenced before construction and replaced after construction pursuant to Section 8771 of the Business and Professional Code."

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