

GRADING MANUAL



**PLANNING & DEVELOPMENT
SERVICES DEPARTMENT**

ORANGE COUNTY

1993 EDITION

THOMAS B. MATHEWS, DIRECTOR

**COUNTY OF ORANGE
PLANNING & DEVELOPMENT
SERVICES DEPARTMENT**

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**GRADING MANUAL
1993 EDITION**

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ORANGE COUNTY GRADING MANUAL
ENVIRONMENTAL MANAGEMENT AGENCY

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SUBARTICLE 1. GENERAL PROVISIONS

1.1 Authority

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

1.2 Scope and Purpose

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

The purpose of the Grading Manual is to assist users of the 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, EMA, to work with industry representatives to develop such rules, interpretation, standard specifications, procedures, requirements and forms.

1.3 Revision

The contents of the 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, EMA. Any person seeking to initiate a revision shall submit a written request accompanied by pertinent supportive data to the Director, EMA. At such time as the Director, EMA, chooses to consider pending revision requests, 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, EMA. Emergency situations may be handled differently insofar as other legal constraints permit. Requests of this nature shall be initiated by correspondence with the Building Official.

SUBARTICLE 2. DEFINITIONS

2.1 Definitions

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

AS-BUILT GRADING PLAN/AS-GRADED PLAN is a plan showing the surface condition of the ground, including line, grade and elevation, as of the date of certification by the civil engineer, architect or other qualified person.

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).

EARTH MATERIAL is any rock or soil or any combination thereof.

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 11,000 \pm years (Holocene geologic time).

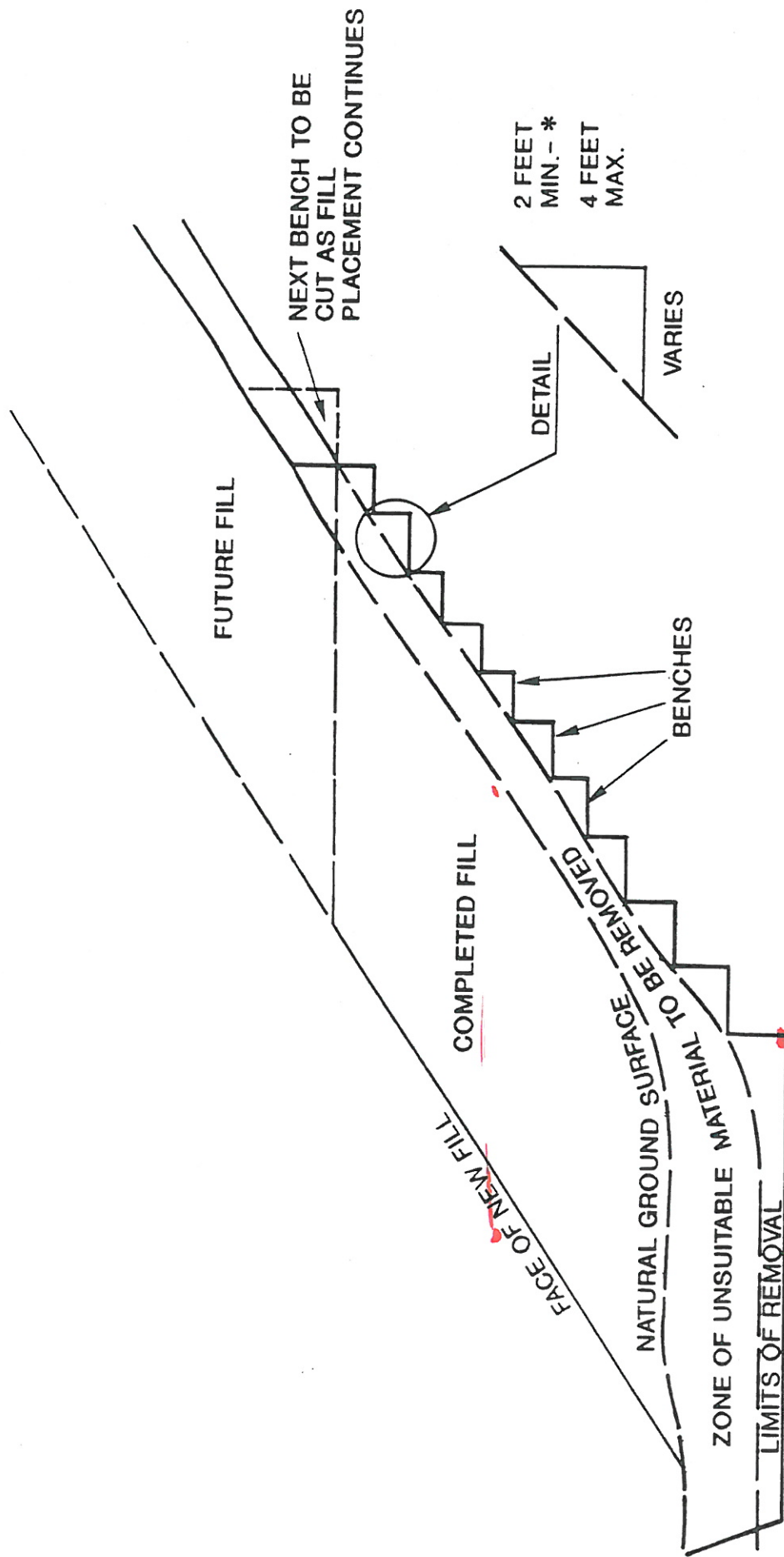
FLATLAND SITE is any site which does not fit the definition of a hillside site.

HILLSIDE SITE is a site which entails 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 adjacent property.

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

RETAINING STRUCTURE is a wall or other device designed to resist lateral pressure.

SEISMICITY is the susceptibility of ground to earthquake-induced motion and surface rupture.



* VERTICAL BENCH HEIGHT MAY BE ADJUSTED BY SOIL ENGINEER AND/OR ENGINEERING GEOLOGIST TO MEET SPECIAL GEOTECHNICAL CONDITIONS.

Figure 1

SLOPE STABILITY ANALYSIS is the mathematical measure of the relative factor of safety against both deep-seated and surficial failure of slope material. 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 (SO_4) 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 4. ORGANIZATION AND ENFORCEMENT

4.1 Grading Board of Appeals

a. Purpose:

Section 7-1-813 of the Code recognizes the need for an appeal process with respect to decisions made by the Building Official in his enforcement of Section 7-1-812 of the Code (Hazardous Conditions). Specifically, Section 7-1-813 of the Code establishes the Grading Board of Appeals. The primary and only purpose of this "Appeals Board" is to be the final avenue of appeal by an owner, owner's agent, permittee or permittee's agent to an order or directive to mitigate a hazardous condition. A hazardous condition exists when, in the opinion of the Building Official, "the state of any natural ground, natural slopes, excavation, fill or drainage device, all of which exist on private property, is a menace to life or limb, or a danger to public safety, or endangers or adversely affects the safety, usability or stability of adjacent property structures, or public facilities." If you have been ordered to mitigate a hazardous condition by the Building Official, and in your opinion, the directive is improper or erroneous, you may request a hearing by the "Appeals Board."

b. Convening the Appeals Board:

The Appeals Board functions as an ad-hoc Board. It only convenes when the Board Secretary schedules a meeting.

The Board Secretary will schedule a meeting only when a proper appeal has been lodged with the Building Official. If, as the recipient of a "hazardous condition" citation discussed in a. above, you wish to appeal the ruling, you must file an appeal. This appeal must be in writing and must be directed to:

Section Chief
EMA/Grading Plan Check
P. O. Box 4048
Santa Ana, CA 92702-4048

The appeal will be reviewed by the Building Official and, if found to be in acceptable form, a Hearing Officer will be appointed and the appeal will be forwarded to the Secretary of the Board of Appeals. The Secretary will notify the Board, and a meeting of the Board will be scheduled at a time which, insofar as is possible, is convenient to the appellant(s), Board members and Secretary.

c. Board Deliberations:

The appeal filed with the Board of Appeals should be as complete as possible. Include copies of all documents detailing the violation and as complete an explanation of the reasons invalidating the violation as possible. Attach all available reports, maps and other documents supportive of your position. The appellant(s) may be represented by counsel at the hearing but it is not necessary. It is necessary, however, for the appellant to have a well-prepared, carefully considered presentation for the Appeals Board. The Appeals Board is charged with the responsibility of determining in an unbiased manner, whether or not the Building Official has made a fair and accurate determination based on the data submitted by both the Building Official and the appellant(s). A quorum of three regular and/or alternate members of the Appeals Board is required to meet and consider an appeal, and a majority vote of the members present at a meeting constitutes the will of the Appeals Board. A decision by the Appeals Board is final and there is no further appeal.

d. Board Organization:

The Appeals Board consists of five regular and five alternate members. One is a California Certified Engineering Geologist qualified by education, training, experience, and prominence in the field of engineering geology; one is a California Registered Civil Engineer engaged in tract grading design; one is a California Registered Soil Engineer; one is an engineering contractor possessing a valid license from the State of California and experience in grading; and the last is a lay person.

There is an alternate member of the Board for each regular member. The alternate member has the same qualifications required for the regular member. The alternate member serves in the absence of or because of a conflict of interest involving the regular member for whom he is the alternate. A member or alternate is excused from hearing a specific appeal if he informs the Building Official that he believes his participation would constitute a conflict of interest. The Building Official may also excuse a member, regular or alternate, if in his opinion there is a conflict of interest. The Building Official's decision as to conflict of interest is final.

The five regular members are appointed by and serve at the pleasure of the Board of Supervisors, each for a three year term, unless removed sooner by the Board of Supervisors. Any appointment to fill a vacated position is for the remainder of the former occupant's unexpired term. The five alternate members are appointed in the same manner and for the same duration of term as the regular members for whom they are alternates. Terms are staggered such that no more than three regular members and three alternates are replaced at one time. Revisions to the Grading Code or this Grading Manual do not automatically result in the reappointment or reaffirmation of the regular or alternate members of the Grading Board of Appeals, and they don't affect the term of service. A Chairman and a Vice-Chairman are selected annually by the Appeals Board from among its members. The Building Official acts as a non-voting Secretary. The Board adopts rules and regulations for its proceedings in the form of By-Laws. These By-Laws are available for inspection through the Building Official.

e. Board Member Selection Procedure:

The Building Official acts in behalf of the Board of Supervisors to solicit nominations for vacancies on the Grading Board of Appeals that are created by resignations, expiration of term, etc. Insofar as possible, the Building Official obtains nominations before a vacancy is created. Nominations are sought from professional and trade organizations representing the various occupational disciplines required for Board membership. Examples include (but need not be limited to): the Association of Engineering Geologists for the Certified Engineering Geologist member; the American Society of Civil Engineers for the Registered Civil Engineer engaged in tract grading design; the American Society of Civil Engineers - Geotechnical Engineering Group for the Registered Soil Engineer; and the Southern California Contractor's Association for the Engineering Contractor. The lay person is nominated by the Building Official. This individual is not required to have any specific expertise but should be employed at an occupation which affords frequent contact with construction involving grading. No Board member can be a regular employee of a city, county, state or federal agency while serving on the Appeals Board.

f. Compensation:

The regular and alternate members each receive a sum of fifty dollars for each meeting attended, not to exceed one hundred dollars per month. In addition, each member receives an allowance for mileage from his normal place of business or home to the meeting and return at the then prevailing rate for Orange County employees and officials.

4.2 Technical Advisory Board

a. Purpose:

Section 7-1-814 of the Code recognizes the need for the Building Official to render decisions in his enforcement of the Code based on the best technical information available. Specifically, Section 7-1-814 of the Code establishes the Technical Advisory Board. The only purpose of this "Advisory Board" is to provide the Building Official with advice and counsel regarding the technical aspects of the Code and its interpretation. The Building Official may, at his discretion, also use the "Advisory Board" to review technical reports filed with the Building Official and render opinions and interpretations as to their meaning or adequacy.

b. Convening the Advisory Board:

The "Advisory Board" functions as an ad-hoc Board. It only convenes when the Board Secretary schedules a meeting. The Board Secretary will schedule a meeting only when the Building Official so instructs. There are significant differences between the "Appeals Board" and the "Advisory Board." One of these differences is the manner in which the Boards are convened. The "Appeals Board" (Sec. 4:1) can be convened as the result of a proper appeal by a private citizen. The "Advisory Board" will not convene as the result of a request by a private citizen. It can only be convened by the Building Official to provide service to the Building Official.

c. Board Deliberations:

The Advisory Board is charged with providing unbiased advice and counsel to the Building Official. Once an Advisory Board meeting has been convened, the Board may request additional topical information or data from the Building Official and/or it may request the testimony of interested parties or experts. In the event the Board is convened to provide advice regarding a pending permit application or a hazardous condition citation, the applicant or the recipient of the citation may appear before the Board during its deliberations to provide testimony. A quorum of three regular and/or alternate members of the Advisory Board is required to convene and a majority vote of the members present at a meeting constitutes the will of the Board. However, since the Board's function is advisory, a minority opinion report may be filed with the Building Official. Moreover, the opinion of the Board is not binding in any way on the Building Official and does, in no way, deprive the Grading Board of Appeals of its full jurisdiction.

d. Board Organization:

The Advisory Board consists of five regular and five alternate members. Three members are Certified Engineering Geologists qualified by education, training, experience, and prominence in the field of engineering geology and two members are Registered Soil Engineers.

There is an alternate member of the Board for each regular member. The alternate member has the same qualifications required of the regular member. The alternate member serves in the absence of or because of a conflict of interest involving the regular member for whom he is the alternate. A member or alternate is excused from hearing a specific topic if he informs the Building Official that he believes his participation would constitute a conflict of interest. The Building Official may also excuse a member, regular or alternate, if in his opinion there is a conflict of interest. The Building Official's decision as to conflict of interest is final.

The five regular members are appointed by and serve at the pleasure of the Board of Supervisors, each for a three year term, unless removed sooner by the Board of Supervisors. Any appointment to fill a vacated position is for the remainder of the former occupant's unexpired term. The five alternate members are appointed in the same manner and for the same duration of term as the regular members for whom they are alternates. Terms are staggered such that no more than three regular members and three alternates are replaced at one time. Revisions to the Grading Code or this Grading Manual do not automatically result in the reappointment or reaffirmation of the regular or alternate members of the Technical Advisory Board and they don't affect the term of service. A Chairman and a Vice-Chairman are selected annually by the Advisory Board from among its members. The Building Official acts as a non-voting Secretary. The Board adopts rules and regulations for its proceedings in the form of By-Laws. These By-Laws are available for inspection through the Building Official.

e. Board Member Selection Procedure:

The Building Official acts in behalf of the Board of Supervisors to solicit nominations for vacancies on the Technical Advisory Board that are created by resignations, expiration of term, etc. Insofar as possible, the Building Official obtains nominations before a vacancy is created. Nominations are sought from professional and trade organizations representing the various occupational disciplines required for Board membership. Examples include (but need not be limited to): the Association of Engineering Geologists for the Certified Engineering Geologist members and the American Society of Civil Engineers - Geotechnical Engineering Group for the Registered Soil Engineers. No Board member can be a regular employee of a city, county, state or federal agency while serving on the Advisory Board.

The nominations submitted to the Building Official are reviewed and a recommendation for selection is made to the Board of Supervisors. The selection made by the Board of Supervisors is final.

f. Compensation:

The regular and alternate members each receive a sum of fifty dollars for each meeting attended, not to exceed one hundred dollars per month. In addition, each member receives an allowance for mileage from his normal place of business or home to the meeting and return at the then prevailing rate for Orange County employees and officials. These rates are subject to change as directed by the Board of Supervisors.

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 Building Official. The documents are submitted to and fees paid at the Environmental Management Agency - Development Processing Center. Submit the following:

- a. Completed applicant's information sheet for a Building/Grading Permit.
- b. A minimum of six (6) sets of dated grading plans (additional copies may be required during plan check). The Grading Section will route a copy of your plans to Subdivision, Traffic Engineering and Environmental Planning. The remaining copies will be used internally within the Grading Section.
- c. Two copies of a preliminary soil report (if required). See Appendix B for report requirements.
- d. Two copies of a preliminary geology report (if required). See Appendix B for report requirements.
- e. Plan check fee based on estimated earthwork volume and improvement valuation. Payment may be by cash, check or money order. See Subarticle 6 for fee structure.
- f. Three (3) sets of erosion control plans (see Subarticle 13 in the Grading Manual).

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. Geology reports similar to a.
- 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. This may also include hydraulic calculations.

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

5.2 Grading Plan Clearances

The Building Official shall notify the applicant that, prior to issuance of a grading permit, written clearance will be required from other divisions within the Environmental Management Agency and may be required from other agencies.

The majority of permit applications require clearances from the following divisions within the Environmental Management Agency:

- a. EMA/Regulation/Subdivision Division
- b. EMA/Transportation, Transportation Program, Traffic Engineering Section
- c. EMA/Planning, Current Planning Division

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

- a. EMA/Transportation, Special Districts
- b. EMA/Harbors, Beaches & Parks/Program Planning Division
- c. EMA/Harbors, Beaches & Parks/Design Division
- d. EMA/Planning/Advance Planning
- e. Orange County Fire Department/Support Bureau
- f. Orange County Fire Marshal (Fuel Modification)
- g. Orange County Human Services 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 Game
- c. California Coastal Conservation Commission
- d. California Division of Industrial Safety

Upon notification by the Building Official, the applicant shall be responsible for submitting copies of the required plans and information and obtaining clearances or 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 or cloth and shall be of sufficient clarity to indicate the nature and extent of the work proposed and show in detail that they will conform to the provisions of the Grading Manual, the Grading and Excavation Code, and all relevant laws, ordinances, rules and regulations.

The first sheet of each set of plans shall give the location of the 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 (or rough or mass grading permit):

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 information:

1. Vicinity map of the site.
2. Property limits clearly labeled or otherwise identified with accurate contours of existing ground and 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 and 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) of all surface and subsurface drainage devices, walls, cribbing, dams and other protective devices to be constructed with, or as a part of the proposed work.
5. Location of any existing building or structures on the property where the work is to be performed and the location of any buildings or structures 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 Building Official, the permittee shall submit the haul route for review and approval by the EMA Traffic Engineer prior to the issuance of a grading permit. The Traffic Engineer may suggest alternate routes or special requirements in consideration of the possible impact on the adjacent community environment or effect on the public right-of-way itself, which the 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 Building Official.
8. A Grading Plan Standards and Correction Sheet is included in Appendix A which identifies additional items typically required on grading plans depending on site conditions.

b. Precise Grading Permit:

The 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 rough pad elevations.
3. Flowlines for lot drainage.
4. Details for building footing and side-yard swale relationship (including extra height or depth of footing).
5. Proposed concrete flatwork 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. Work required under a preliminary grading permit must be completed before the last increment of the site is converted to precise permit or the remaining work shall be included with a precise permit.

5.4 Soil and Engineering Geology Report Content

Guidelines are provided in Appendix B, "Technical Guidelines for Soil and 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 synonymous.

a. Preliminary Soil Report:

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. Soil reports shall also be required for grading or building permits on single lot projects when specified by the Building Official.

The preliminary 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 pavement 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; and 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 soil engineering report.

c. Seismicity Report:

(Required if the project is within an Alquist-Priolo Special Study Zone).

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

The report shall be prepared by a geologist, registered in the State of California, with expertise in earthquake technology and its application to buildings and other civil engineering works. The scope of the report shall be commensurate with the proposed development and shall reflect the state of the art. The seismic report may be combined with the soil and engineering geology reports.

d. Final Reports:

Rough grade and final soil and engineering geology reports shall be submitted in accordance with Subarticle 15 of this 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 Building Official.

5.6 Permit Expiration

The time limitations and provisions of Section 303, Permits Issuance, of the Uniform Building Code as amended relating to expiration of grading permits are included in Appendix C.

SUBARTICLE 6. FEES

6.1 Plan Check Fee

Plan check fees on each site shall be based on (1) the valuation of the volume (cubic yards) of cut or fill, whichever is greater, and (2) the estimated value of on-site drainage improvements. The amount of the plan check fees for grading plans shall be as specified by resolution of the Board of Supervisors.

If two projects are under the same ownership and mutually dependent for balancing of earthwork and if each site is being developed under individual planning approvals (tentative maps, use permits, site plans, etc.), the plan check fee will be based on the valuation of the total volume (cubic yards) of cut or fill, whichever is greater, for the combined sites. A 10% surcharge will be added to each plan check fee as an adjustment for the increased review required when dealing with planning approvals for more than one project. The plan check fee shall be proportioned on each of the grading permits to conform to that project's fraction of the earthwork volume used in the fee computation.

In order to have both sites considered as one project site, the following must be met:

1. A separate grading plan must be prepared and submitted for each site.
2. The plans must be submitted together and processed simultaneously as one project.
3. Each set of plans shall show a summary of the earthwork quantities within that project.
4. Both sites must be graded by the same grading contractor and in one continuous operation as if both sites were one project.
5. The grading must be accomplished using conventional earth moving equipment. The trucking of material on public roads, or between sites more than one mile apart measured along the haul route will not be allowed.
6. Each project will require a separate bond based on the work within that project.
7. Any future change of ownership, consultant or contractor prior to completion of the permitted work must take place on both projects or the difference between the reduced permit and full permit fees remitted.
8. Revisions to the permitted projects will be subject to the same benefits and restrictions.

For the purpose of this section, on-site drainage improvements shall include, but need not be limited to, pavement surfacing, inlets, outlet structures, subsurface drainage devices, riprap, curb and gutter and erosion control facilities. Asphalt concrete is classified as a secondary drainage device when used for roadway and parking lot surfacing or other similar uses for the purposes of determining plan check and permit fees. No separate charge shall be made for public and private street improvements required by administrative condition of approval and inspected by EMA, Public Works.

Separate permits and/or fees shall apply to retaining walls, major drainage structures, and other improvements as prescribed by the Building Official.

An additional plan check fee may be assessed at the discretion of the Building Official when plans or reports submitted prior to issuance of a permit are substantially incomplete, or significantly changed from a previous submittal, and require additional plan check/report review. The fee shall be based on the difference of the new total yardage valuation and drainage improvement valuation fees and the original yardage valuation and drainage improvement valuation fees, or on the basis of the established hourly rate for the time required to process the revised plans/reports, as determined by the Building Official.

The plan check fee for substantial revisions to previously approved grading plans for which there is an active grading permit shall be based on the difference of the new total yardage valuation and drainage improvement valuation fees and the original yardage valuation and drainage improvement valuation fees or on the basis of the established hourly rate for the time required to process the revision, as determined by the Building Official. The fees/rates used shall be the fees/rates in effect at the time the revisions are checked/reviewed. The fee may be waived if in the opinion of the Building Official it is not warranted due to the minor nature of the changes.

Erosion control plans checked subsequent to grading permit issuance shall be treated as a substantial revision for the purpose of determining plan check fees.

6.2 Preinspection Fee

Before issuance of a building permit for a building or other structure, the Building Official shall collect a grading preinspection fee, as specified by Board of Supervisors resolution, to verify site conditions and to determine the need for a grading permit or other special requirements. Where a subdivision (tract), multiple housing, or commercial units are part of one grading site, only one fee is required. Where individual lots are preinspected separately, a fee shall be charged for each site. If a grading permit is required, no preinspection fee shall be charged.

6.3 Grading Permit Fee

Grading permit fees on each site shall be based on (1) the valuation of the volume (cubic yards) of cut or fill, whichever is greater, and (2) the estimated value of on-site drainage improvements. On-site drainage improvements shall be considered the same as described for plan checking fees in this Subarticle.

If two projects are under the same ownership and mutually dependent for balancing of earthwork and if each site is being developed under individual planning approvals (tentative maps, use permits, site plans, etc.), the permit fee will be based on the valuation of the total volume (cubic yards) of cut or fill, whichever is greater for the combined sites. The permit fee shall be proportioned on each of the grading permits to conform to that project's fraction of the earthwork volume used in the fee computation.

The fee for a minimum fee grading permit for inspection purposes only, described in Section 7-1-805(a) Grading Permits, of the Grading Code shall be based on \$20,000 minimum valuation for earthwork volume plus the estimated value of on-site drainage improvements to be inspected.

The fee(s) for authorizing additional grading work to that under a valid grading permit including erosion control work shall be computed as specified for plan checking substantial revisions in this subarticle.

6.4 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 Grading Code.

6.5 Reinspection Fee

When any reinspection is required due to the negligence of the permit holder or agent or due to the failure of said parties to comply with previous correction instructions, a fee as established by resolution shall be charged by the Building Official for each such reinspection. The fee shall be paid before any further inspections are made.

This subsection is not to be interpreted as requiring reinspection fees the first time a job is rejected for failure to comply with the requirements of this Manual, but as controlling the practice of calling for inspection before the job is ready for such inspection or reinspection.

6.6 Investigation Fee

An investigation fee as established by resolution may be charged by the Building Official whenever any work for which a permit is required by the Grading Code has been commenced without first obtaining said permit. This fee shall be paid and the investigation shall be made prior to the issuance of any permit for said work.

An investigation fee may be charged for any investigation of a building, structure, site, or any other related work, requested by an owner or authorized agent of such owner. An investigation fee shall not be charged for complaints against projects under a valid grading permit or for investigations of hazardous conditions as determined by the Building Official.

6.7 Refunds

- a. Plan check fee refunds will be made in an amount equal to eighty (80) percent if the request for such refund is received before the commencement of the first complete plan check, except that no refund will be made for less than twenty-five (\$25.00) dollars, and no refund will be made if one (1) year has elapsed from date of plan check fee payment.
- b. Permit fee refunds will be made in an amount equal to eighty (80) percent where work authorized by said permit has not commenced, except that no refund will be made for less than twenty-five (\$25.00) dollars, and no refund will be made if one (1) year has elapsed from the date of permit issuance.
- c. A permit fee refund will be made when the permittee reduces the volume of permitted grading if:
 1. The calculated permit fee for the former volume less the calculated permit fee for the new volume exceeds twenty-five (\$25.00) dollars.
 2. A revised plan is processed.
 3. A written request is submitted to the County of Orange. The refund shall equal 80% of the difference computed above.
- d. Permit and plan check fees will be refunded in their entirety when inadvertently paid for a project outside the jurisdiction of the County of Orange or as duplicate fees, except that no refund will be made if one (1) year has elapsed from the date of payment.

SUBARTICLE 7. SECURITY

7.1 Types of Security

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 Building Official with the concurrence of County Counsel, when necessary.

Examples of security forms are found in Appendix D.

7.2 Security Amount

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 control facilities being constructed or installed under the permit. Pavement areas controlled through the grading permit process shall be considered as drainage devices.

The amount of the security may be reduced by the 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 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 control facilities if the potential hazards or nature of the project justifies such an increased amount.

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 Building Official. For completion of work requirements, see Subarticle 15. Security release shall be accomplished by written notification to the permittee from the Building Official. In the case of a preliminary permit where maintenance of erosion control devices 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 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 Building Official may accept the same if it is suitable to insure completion of the work remaining to be performed and 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 and when recommended in the soil engineering or engineering geology report and approved by the 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 Planning Commission, Subdivision Committee, or the Board of Supervisors without appropriate revision of said condition by the approving body.

Recommendations in the soil 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 soil engineer shall consider both gross 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, except in the case of slopes of minor height when recommended by the geotechnical consultant and approved by the 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 soil engineer and/or engineering geologist and approved by the 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.

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 soil engineer and/or engineering geologist as suitable foundation for fill.

Unsuitable soil shall be removed prior to placement of fill.

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 Building Official may permit placement of larger rock when the 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 grading plan.

- b. Rock sizes greater than twelve (12) inches in maximum dimension shall be ten (10) feet or more below final grade, measured vertically and measured horizontally from slope faces. This depth may be reduced upon recommendation of the soil engineer and approval of the Building Official providing that the permitted use of the property will not be impaired.
- c. Rocks greater than twelve (12) inches shall be placed so as to be completely surrounded by soils; no nesting of rocks will be permitted.

9.4 Compaction

All fills shall be compacted to a minimum of ninety (90) percent of maximum density as determined by Uniform Building Code Standard No. 70-1 or equivalent, as approved by the Building Official. Field density shall be determined in accordance with the Uniform Building Code Standard No. 70-2, or equivalent, as approved by the Building Official.

Locations of field density tests shall be determined by the soil engineer 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 Grading Code and where the 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 Table No. 29-C of the Uniform Building Code exist, lesser compaction may be granted by the Building Official upon justification and recommendation by the soil engineer.

Fill slopes shall be compacted to the finish slope face as specified above. The soil engineer shall provide specifications for the method of placement and compaction of the soil within the zone of the slope face.

Sufficient maximum density determinations by test method, Uniform Building Code Standard No. 70-1 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.

9.5 Slope

Fill 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 and when recommended in the soil engineering report and approved by the Building Official, fill 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 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 or approval of any project or are designated on any map approved by the Planning Commission, Subdivision Committee, or the 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 soil engineer shall consider both the gross and surficial stability of the slope and provide a written opinion of the slope stability. In addition, the soil engineer shall recommend alternative methods of construction or compaction requirements if necessary to obtain surficial stability.

9.6 Utility Line Backfill

Utility line backfill beneath and adjacent to structures; beneath pavements; adjacent and parallel to the toe of a slope; 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 soil engineer and approved by the Building Official prior to backfilling.

Utility line backfill in areas other than those stated above need no specified placement method or compaction criterion, but shall require approval by the soil engineer.

The final utility line backfill report from the project soil engineer shall include a statement of opinion that the backfill is suitable for the intended use.

SUBARTICLE 10. SETBACKS

10.1 Setbacks from Permit Area Boundary

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.

10.2 Design Standards for Setbacks

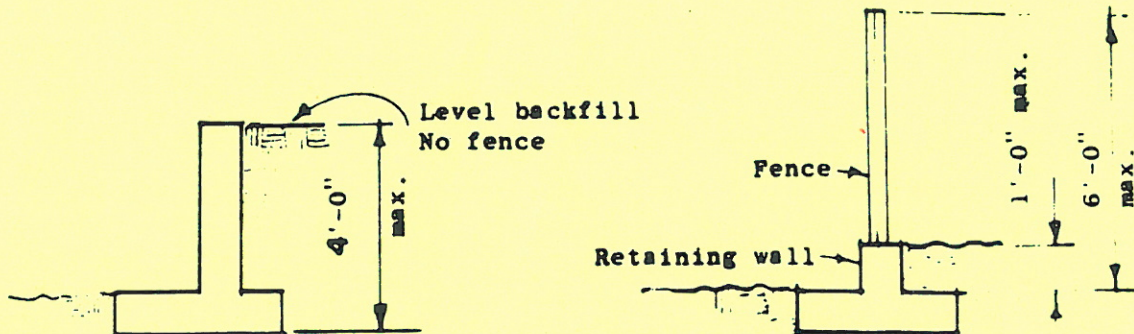
The tops and the toes of cut and fill slopes shall be set back from structures as far as is necessary for adequacy of foundation support and to prevent damage as a result of water runoff, erosion or maintenance of the slopes.

Unless otherwise approved by the Building Official based on recommendations in the approved soil engineering and/or engineering geology report on the approved grading plan, setbacks shall be no less than shown in Figure 2.

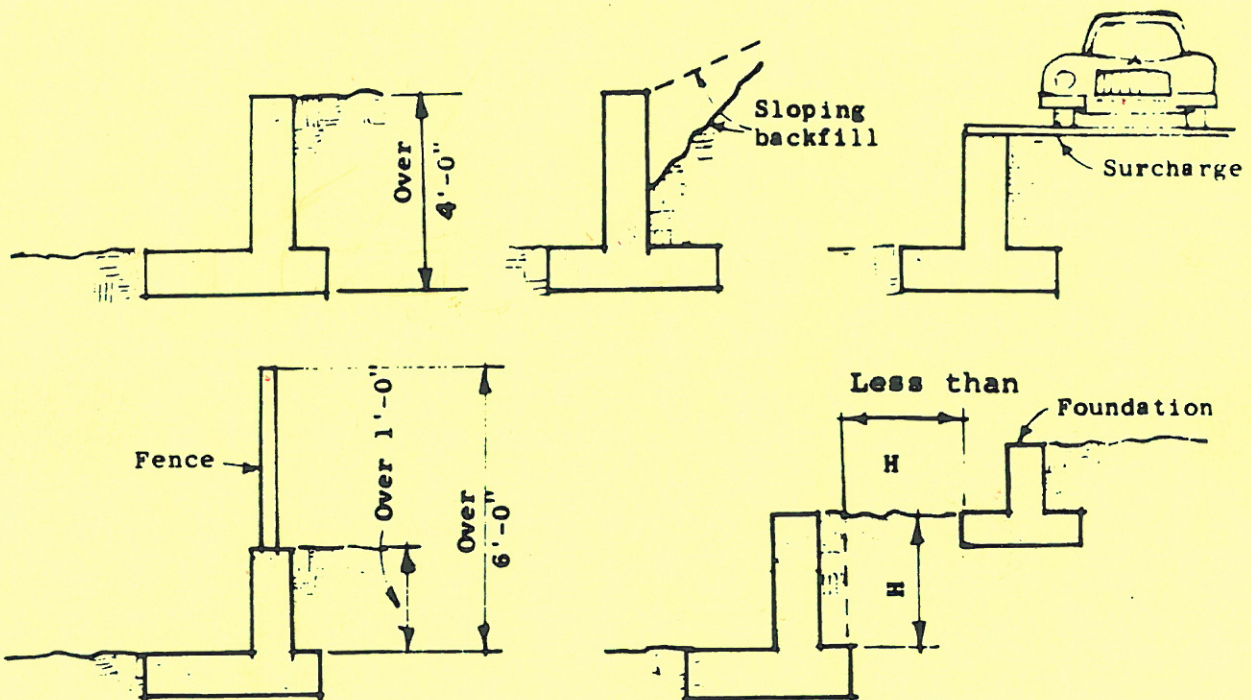
10.3 Retaining Walls

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

PERMITS ARE NOT REQUIRED FOR CONDITIONS SHOWN.



PERMITS ARE REQUIRED FOR CONDITIONS SHOWN BELOW:



COUNTY OF ORANGE

ENVIRONMENTAL MANAGEMENT AGENCY
REGULATION

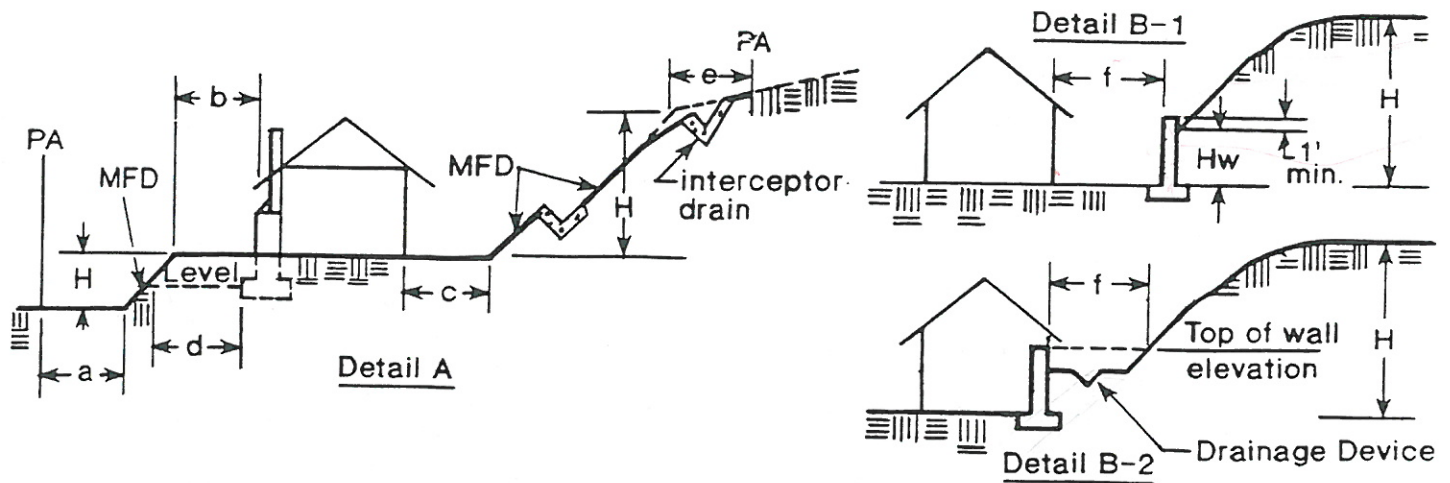
CENTRAL OFFICE
12 CIVIC CENTER PLAZA
P.O. BOX 4048
SANTA ANA, CA 92702-4048
714-834-2626

REGIONAL OFFICE
22921 TRITON WAY
LAGUNA HILLS, CA 92653
714-472-7979

RETAINING WALL PERMIT REQUIREMENTS

Donald J. Novello INFORMATION
SHEET-#1
R.J. Novello, Director of Regulation

Figure 2



Min. Setback from Adjacent Slope					
H(hgt.) Feet	a	b	c	d	e
0-6	3'	7'	3'	5'	1'
6-14	5'	7'	H/2	H/2 5'min.	H/5
14-30	5'	H/2 10'max.	H/2	H/2 10'max.	H/5
+30	5'	10'	15'	10'	6'

Table A

H(hgt.) Feet	Max. Hw	Min. Setback f
0-6	3'	3'min.
6-12	H/2	H/2
12-30	6'	H/2
+30	6'	15'

Table B

NOTES:

1. PA means permit area boundary and/or property line; MFD means manufactured surface.
2. Setbacks shall also comply with applicable zoning regulations.
3. 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.
4. "b" may be reduced to ~~5'~~ 5' minimum if an approved drainage device is used; roof gutters and downspouts may be required.
5. "b" may be reduced to less than 5' if no drainage is carried on this side of structure and if roof gutters are included.
6. If the slope between "a" and "b" levels is replaced by a retaining wall, "a" may be reduced to zero and "b" remains as shown in Table A. The height of the retaining wall shall be controlled by zoning regulations.
7. "b" is measured from the face of the structure to the top of the slope.
8. "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 soil report and approved by the Building Official.
9. "f" may be reduced if the slope is composed of sound material that is not likely to produce detritus and is recommended by the soil engineer or engineering geologist and approved by the Building Official.
10. "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.
11. "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 not more than thirty (30) foot vertical intervals on all cut or fill slopes steeper than 5 feet horizontal to 1 foot vertical to control surface drainage and debris, except that 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 4 feet horizontal to 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 Building Official. Suitable access shall be provided to permit proper cleaning and maintenance whenever practical.

Swales or ditches on 6 feet and 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 Subsurface Drainage

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) soil engineering or engineering geology report and/or shall appear on the approved grading plan pursuant to the approval of the soil engineer and/or the engineering geologist.

Subsurface drainage facilities shall be installed where natural and/or artificially introduced ground water 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 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.

Where surface waters are to be conducted or directed onto adjacent property in an unnatural manner, the 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.

Building sites shall have a sheet flow drainage gradient of two (2) percent from the structure toward approved swales and/or drainage facilities, unless otherwise waived by the Building Official. The maximum drainage gradient of an earth swale shall be 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 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 or fill slope.

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

	Minimum Gradient
a. Earth Swales	1.0%
b. Earth (sheet flow)	1.0%
c. Asphalt pavement (sheet flow)	1.0%
d. Concrete drain in earth area	0.5%
e. Concrete gutter in asphalt paved area	0.28%

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 top of slope greater than forty (40) feet 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 Building Official.

11.5 Pipe Specifications

Pipe material specifications shall be shown on the approved plans or in the approved soil report by the civil engineer or soil engineer and approved by the Building Official. The pipe shall conform to the currently adopted Standard Specification for Public Works Construction unless otherwise recommended by the civil engineer or soil engineer and approved by the Building Official.

Approved pipe includes but is not limited to:

- a. Asbestos Cement Pipe (ACP)
D-load to be designed and shown on approved grading plans.

- 1. Subdrain - ASTM C508
- 2. Stormdrain - ASTM C663
 - (a) Maximum velocity, 10 feet per second

- b. Acrylonitrile Butadiene Styrene (ABS)

- 1. Subdrain (a) ASTM D2751, SDR 35
(b) ASTM D1527, Schedule 40
- 2. Stormdrain
 - (a) ASTM D2751, SDR 35
Maximum velocity, 8 feet per second
 - (b) ASTM D1527, Schedule 40
Maximum velocity, 15 feet per second

- c. Polyvinyl Chloride (PVC)

- 1. Subdrain
 - (a) ASTM D3034, SDR 35 (4"-15" diameter)
ASTM F679, SDR 35 (18"-27" diameter)
Maximum velocity, 8 feet per second
 - (b) ASTM D1785, Schedule 40
- 2. Stormdrain
 - (a) ASTM D3034, SDR 35 (4"-15" diameter)
ASTM F679, SDR 35 (18"-27" diameter)
Maximum velocity, 8 feet per second
 - (b) ASTM D1785, Schedule 40, (4"-12" diameter)
Maximum velocity, 15 feet per second

d. Reinforced Concrete Pipe (RCP)

D-load to be designed and shown on approved grading plans.

e. Corrugated Steel Pipe (CSP)

Metal thickness to be designed and shown on approved grading plans. Pipe to be bituminous coated.

f. Corrugated Aluminum Pipe (CAP)

Metal thickness to be designed and shown on approved grading plans. Pipe to be bituminous coated.

g. Nonreinforced Concrete Pipe

Pipe shall be extra strength.

The maximum flow design parameters may be exceeded in special circumstances when justified and recommended by the civil engineer and approved by the Building Official.

All solid wall plastic pipe (ABS and PVC) shall bear the International Association of Plumbing and Mechanical Officials (IAPMO) or National Sanitation Foundation (NSF) seal of approval.

Plastic pipe which is perforated for subdrain use after purchase from the manufacturer shall also bear either the IAPMO or NSF seal. Subdrain pipe perforated by the manufacturer shall be certified in writing by an independent materials testing laboratory as to its having been fabricated from solid wall pipe which conforms with the applicable ASTM specification prior to installation on any grading project.

Plastic pipe fittings shall be of like material and equal or greater strength to that of the designated pipe. Solvent welds shall be with an appropriate solvent.

Perforations shall conform to AASHTO M278-81 or ASTM F758 or other approved equal.

11.6 Area Drain Grates

The minimum cross-sectional area of area drain grates shall not be less than 100 square inches, and shall contain a grate cover having 50% net opening. Exceptions may be approved by the Building Official where inlets are proposed but not required or where domed inlets may be a safe alternative.

11.7 Conduits Beneath Structures

Drainage conduits placed beneath structures shall conform to the requirements for sewer and waste plumbing. PVC and ABS pipes shall be Schedule 40.

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 or soil engineer and approved by the Building Official.

11.9 Hydraulic Capacity

Excepting standard terrace and down drains, drainage conveyance devices exceeding 100 feet in length shall be designed to carry the 10 year storm runoff. The design capacity shall be increased to the 25 year storm runoff for the design of all closed conduit systems having sump inlet conditions. Drainage conveyance devices less than 100 feet in length may use 4-inch diameter pipes or open swales consistent with the minimum dimensions specified in EMA Standard Plan No. 1320. Irrespective of the length of any conveyance device, if the tributary drainage area is greater than 0.25 acres, the design criteria specific above for devices greater than 100 feet in length shall be used.

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 Environmental Management Agency special provisions for asphalt concrete and untreated base materials unless otherwise approved by the 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 placed, as determined by the soil engineer and approved by the Building Official.

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

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

12.2 Subgrade Compaction

The top 6 inches of the subgrade material shall be compacted to a relative compaction of 90 percent of maximum density as determined by Uniform Building Code Standard 70-1 or approved equivalent unless otherwise recommended by the soil engineer in the preliminary soil report and approved by the Building Official.

12.3 Soil Sterilization

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 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 the Environmental Management Agency or construction of public roadways, or methods acceptable to the Building Official. Unless otherwise specified by the soil engineer, the relative compaction of each layer of compacted base material shall not be less than 95 percent.

When private street improvement plans are required to be approved by the Environmental Management Agency, the pavement structural section may be determined by the Environmental Management Agency 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:

	Pavement Structural Section
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 areas	3" AC/12" UB

12.6 Driveways

Whenever access is taken from a street, alley or driveway to an off-street parking area serving (4) or less dwelling units, the driveway or other vehicular accessway shall have a maximum grade of plus fifteen percent (+15%) or minus six percent (-6%), measured from the street, alley or driveway grade along the driveway centerline, for a distance of not less than eighteen (18) feet from the street, alley or driveway right-of-way line.

Whenever access is taken from a street, alley or driveway to an off-street parking area serving industrial, commercial or professional uses, public or community facilities, or five (5) or more dwelling units, the driveway or other vehicular accessway 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 CONTROL

13.1 Information on Erosion Control Plans

The plan shall include but not be limited to:

- a. The name and twenty-four (24) hour telephone number of the person responsible for performing emergency erosion control work.
- b. The signature of the civil engineer or other qualified individual who prepared the grading plan and who is responsible for inspection and monitoring of the erosion control work.
- c. All desilting and erosion protection facilities necessary to protect adjacent property from sediment deposition.
- d. The streets and drainage devices that will be completed and paved by October 15.
- e. The placement of sandbags or gravelbags, slope planting or other measures to control erosion from all slopes above and adjacent to roads open to the public. Gravelbags are preferred over sandbags.
- f. The plan shall indicate how access will be provided to maintain desilting facilities during wet weather.

13.2 Approval of Erosion Control Landscaping

Effective planting for erosion control shall be deemed to have occurred when the landscape architect submits an acceptable written verification that he has observed the completed erosion control landscaping and is satisfied that sufficient growth has taken place to be effective in controlling erosion on all erodible manufactured slope faces. Where no condition of approval requires a landscape plan, the determination of effectiveness shall be made by the grading inspector.

SUBARTICLE 14. GRADING INSPECTION

14.1 Site Inspection by the Building Official

Prior to any grading, brushing, or clearing, there shall be a pregrading meeting held on the site. Prior to pouring curb and gutter or placement 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 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 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. Toe bench and key: After the natural ground or bedrock is exposed and prepared to receive fill, but before fill is placed.
3. Over-Excavation: After the area has been cut but before fill is placed.
4. Cut: After the cut is started, but before the vertical depth of the cut exceeds ten (10) feet, and every ten (10) feet 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 Building Official.
5. Fill: After the fill has started, but before the vertical height of the fill exceeds 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 Building Official.

b. Concrete or gunite drainage device inspection:

1. Alley gutter and/or concrete device draining asphalt:
 - (a) Subgrade (prior to placement of concrete): Subgrade is to be prepared and required reinforcement placed. The civil engineer 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 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 civil engineer 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 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 civil engineer 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 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 civil engineer 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 civil engineer 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 pouring concrete. The civil engineer shall provide a field memo that line and grade is set in accordance with the approved plans.

3. Earth Swales:

- (a) Prior to rough grading approval or lumber drop.
- (b) Prior to final grading approval.

d. Rough grade inspection:

When all rough grading has been completed. This inspection may be called for at the completion of rough grading without the necessity of the 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 inspection:

1. Subgrade:

After subgrade has been established, tested and approved by the soil engineer, or his qualified representative. The soil engineer shall provide a field memo of compaction test results. The civil engineer 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 soil engineer, or his qualified representative, but prior to prime coat and asphalt placement. The soil engineer shall provide a field memo of compaction tests results. The civil engineer 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 soil engineer, or his qualified representative or a special inspector when authorized. Material invoices may be required. Asphalt placement need not await the arrival of the grading inspector provided that proper notification has been made to the 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 (rainy season: October 15 to April 15):

- 1. After excavation of desilting basins but prior to fill placement. Prefabricated devices are to be available on-site for inspection.
- 2. After fill placement for desilting basins but prior to placement of concrete or other non-erosive materials.
- 3. After completion of an erosion control system in accordance with an approved erosion control plan and the requirements of the Building Official.

14.2 Special Inspections

The responsibilities and duties of a special inspector as provided in Section 306, Special Inspections, of the Uniform Building Code as amended are included in Appendix E.

14.3 Alternate Materials and Methods of Construction

- a. The provisions of this Grading Manual are not intended to prevent the use of any material or method of construction not specifically prescribed by the Grading Code or this Grading Manual provided any such alternate has been approved pursuant to this section.

- b. The Building Official may approve any such alternate provided he finds that the proposed design is satisfactory and complies with the provisions of the Grading Code and this 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 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 Grading Manual or evidence that any material or any construction does not conform to the requirements of this Grading Manual or in order to substantiate claims for alternate material or methods of construction, the 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 Grading Manual for the material in question. If there are no appropriate test methods specified, the Building Official shall approve the test procedure. Copies of the results of all such tests shall be retained for a period of not less than two (2) years after the acceptance of the grading.

SUBARTICLE 15. COMPLETION OF WORK

15.1 Final Reports

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

- a. An as-graded grading plan prepared by the civil engineer, architect or other qualified person, 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 civil engineer 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).
 3. Setting of all monuments in accordance with the recorded tract map (rough or final grading).
 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 civil engineer, the architect, or other licensed professional who prepared the plan shall provide written approval of the grading as being substantially in conformance with the approved grading plan.

- c. A soil engineering report prepared by the soil engineer, 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 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 Uniform Building Code Standard 70-2 or the approved equal shall be so noted. The soil engineer shall provide a written opinion as to the adequacy of the site for the intended use, as affected by the soil engineering factors. The Building Official may require that the soil tests or testing be performed by an approved testing agency.
- d. A geology report prepared by the engineering geologist, including a final description of the geology of the site including any new information disclosed during the grading, and the effect of same on recommendations incorporated into the approved grading plan. He shall provide a written opinion as to the adequacy of the site for the intended use as affected by geologic factors and when required by the Building Official, shall submit an as-built geologic map.
- e. A statement prepared by the grading contractor describing the volume of cut and fill moved on the project. In addition, if the grading plan was not prepared by a registered civil engineer or registered professional authorized to prepare grading plans and perform inspections, the grading contractor shall submit written approval that the work was completed in accordance with the approved plans.

APPENDIX A

GRADING PLAN STANDARDS

AND

CORRECTION LIST

Regional Office
22931 Triton Way
Laguna Hills, CA 92563
(714) 472-7979

ENVIRONMENTAL MANAGEMENT AGENCY
REGULATION
DEVELOPMENT SERVICES
GRADING SECTION
ROOM G-12, 12 CIVIC CENTER PLAZA

Central Office
P.O. Box 4048
12 Civic Center Plaza
Santa Ana, CA 92702
(714) 834-2626

GRADING PLAN STANDARDS AND CORRECTION LIST

Contact Name _____

Telephone _____

Plan is O.K. _____
Date _____ P.C.'er Initial _____

Plan Check Record		
Date Rec'd		Date Check Comp*
	Initial Ck.	
	Re-check	
	Re-check	
	Re-check	
	Re-check	

* If contact person notified on other than date of completion, enter data contacted.

OWNER'S NAME _____ PROJECT ADDRESS _____

CHECKED BY _____ PHONE NO. _____ TENT. TRACT OR PARCEL MAP # _____

APPLICATION/PERMIT # _____ RECORDED TRACT OR P.M. # _____

CIRCLED ITEMS REQUIRE CORRECTION OR SUBMITTAL.

Corrections shall be made on the tracings and 3 new sets of plans shall be submitted.
IF YOU MAKE CHANGES TO THE PLAN OTHER THAN OR IN ADDITION TO WHAT PLAN CHECK HAS REQUESTED, YELLOW HIGHLIGHT THE CHANGES ON ONE SET OF THE RESUBMITTED PLANS.

RETURN THIS SHEET WITH CORRECTED PLANS AND THE ORIGINAL CHECK PRINT. Payment of a new plan fee shall be required for all plans on which no action is taken by the applicant for a period of 180 days. Applications for which no permit is issued within 180 days following date of submittal shall expire by limitation, and shall be discarded.

I. SUBMITTALS, FEES, BOND, INSURANCE, AND ISSUANCE

a. Provide 3 complete sets of corrected plans. The maximum size shall be 36" X 42". All sheets shall be uniform size. Plans will not be rechecked at the counter. Allow one week for recheck.

b. Fees shall be calculated by the plan checkers when final quantity and cost estimates are provided by the engineer:
PLAN CHECK FEES:

Grading _____

Improvements. _____

Paid _____

BALANCE.... _____

PERMIT FEES:

Grading _____

Improvements. _____

Issuance Fees _____

BALANCE.... _____

TOTAL BALANCE

DUE..... _____

c. Bond is required in the amount of \$ _____. Bond may be posted in one of the following forms:

(1) Surety

(2) Cash or Cashiers Check

(3) Cert. of Deposit

(4) Letter of Credit

Personal or Company checks cannot be accepted. County approved forms for the various types of bonds are available upon request at the Grading Counter, Sta. 6, Room G-12. Please note all signatures must be notarized.

d. Contractor must provide verification of insurance for worker's compensation coverage. If owner is doing work and does not employ other workers, owner exemptions must be signed.

e. Owner or authorized agent and/or contractor must sign the permit at the time of issuance.

II. CLEARANCES REQUIRED

- a. EMA/Regulation - Subdivision Division (For consistency with any public improvement plans, drainage across properties, flood plain encroachments, encroachment permit needs. Initial plan has been routed.) - Room 225.
- b. EMA/Regulation - Public Property Permits Division (Permit or clearance for any encroachment in public right of way. Submit necessary plans and application for encroachment permit.) - Station 9, Room G12.
- c. EMA/Regulation - Development Services Division/Acoustics Unit (For acoustical review. Plan submittal may be required.) - Room G19.
- d. EMA/Regulation - Environmental Resources Division (For compliance with Clean Water Act/NPDES permit. Submit one set of plans.) - 10852 Douglas Rd., Anaheim.
- e. EMA/Transportation - Traffic Engineering Division (For sight distance at driveways, intersection, etc., haul routes, max. and min. grading on driveway approaches, streets, etc. Initial plan has been routed.) - 901 Civic Center Dr. West, Ground Floor.
- f. EMA/Transportation - Transportation Planning Division (For Transportation Corridor Agency or regional traffic review. Submit one set of plans.) - 901 Civic Center Dr. West, Ground Floor.
- g. EMA/Transportation - Special Districts Division (For special district fee programs review. Submit one set of plans.) - 901 Civic Center Dr. West, Suite 230.
- h. EMA/Planning - Development Planning Division/Current Planning (For verification of consistency with zoning requirements and conditions of approval tied to grading permit issuance. Provide one set of plans after Grading Plan Check approval. If significant changes are made after original grading permit application, a new Site Development Permit or revised Site Development Permit may be required.) - Station 1, Room G12.
- i. EMA/Planning - Environmental Planning (For environmental analysis determination and clearance. Initial plan has been routed.) - Room G19.
- j. EMA/Planning - Development Planning Division/Land Planning (For regional planning consistency, i.e. trails, scenic corridors, open space, etc. Submit one set of plans.) - Room 238.
- k. EMA/Harbors, Beaches, and Parks (For review and clearance of any grading in existing or proposed open space, park, or recreation area. Submit one set of plans.) - 401 Civic Center Dr. West, 10th floor.
- l. EMA/Administration - Financial Services Division/Financial Operations (For Foothill Circulation Phasing Plan allocation clearance.) - Room 114.
- m. Letter from County certified archaeologist must be submitted acknowledging responsibilities.
- n. Letter from County certified paleontologist must be submitted acknowledging responsibilities.
- o. HCA/Environmental Health (For vector control clearance.) Submit necessary plans - 2009 E. Edinger, Santa Ana, CA 92705.
- p. Fire Department, Orange, Co. - Fire Prevention/Wildland Defense and Hazard Reduction (For fuel modification clearance. Submit necessary plans.) - 180 S. Water St. Orange, CA 92666.
- q. Fire Department, Orange Co. - Fire Prevention/Planning and Development (for fire fighting and emergency equipment accessibility clearance. Submit one set of plans.) - 180 S. Water Street, Orange, CA 92666.
- r. Fire Department, Orange Co. - Fire Prevention/Planning and Development (for blasting permit clearance. Submit necessary plans.) - 180 S. Water Street, Orange, CA 92666.

II. CLEARANCES REQUIRED (CONTINUED)

s. California Department of Fish and Game
(For streambed or wetlands alteration
permit/clearance.) Submit necessary plans.
- 330 Golden Shore, Suite 15, Long Beach,
CA 90802; 213-590-5132.

t. _____

u. _____

v. _____

III. GENERAL REQUIREMENTS

- a. Show assigned project address on title sheet of plan.
- b. Show yardage figures on plans:
cut _____ yds; overexcavation _____ yds;
natural fill _____ yds; import _____ yds;
export _____ yds; remedial _____ yds.
- c. Title sheet of all sets of the plans must be "wet" stamped and signed by the Civil Engineer/Architect of Record for the project.
- d. Show on plans:
- | | |
|-----------------------|--------------------------|
| _____ North Arrow | _____ Grading Limits |
| _____ Scale | _____ Permit Limits |
| _____ Grading Legend | _____ Property Lines |
| _____ Vicinity Map | _____ Tract Boundary |
| _____ Bldg. Numbers | _____ Tentative Tract or |
| _____ Record Tract or | _____ Parcel Map Lot |
| _____ Parcel Map Lot | _____ Number (s) |
| _____ Number (s) | |
- e. Show location of all existing and proposed structures, buried tanks and wells.
- f. Submit an itemized summary of the unit and total cost of all drainage devices, grading, paving, and erosion control.
- g. A notarized letter of permission from adjacent property owner(s) is required for slope encroachment or other off-site grading or work. Include legal description and Assessor's Parcel Number.
- h. Retaining walls are not a part of the grading permit. Submit for separate building permits. Note on plans. Show location of walls on grading plan plus top of wall elevations, adjacent finished surface elevations, top of footing elevations, and a cross section detail showing subdrain design.

- i. Show all cut/fill transitions and daylight lines.
- j. Show existing and proposed elevations using contours and/or spot elevations.
- k. Indicate disposition of excess earth materials. A separate permit may be required. Traffic Engineering Division must approve haul routes over public roadways.
- l. Add the following to the plans
1. Grading and erosion control notes, See attached sheets.
 2. Detail sheets for _____
 3. _____
- m. Show street width and centerline. Include cross-section detail.
- n. Show all easements.
- o. Extend existing contours or spot elevations to reflect off-site areas and identify drainage pattern.
- p. Planning Commission/Subdivision Committee review of grading plan(s) is required prior to issuance of grading permit. Submit 20 sets of pre-folded final plans (suitable for mailing), color coded, showing approved concept vs. proposed deviations, and a letter of explanation and justification. Also submit 20 sets of pre-folded tentative tract maps hi-lighting areas of proposed deviations.

III. GENERAL REQUIREMENTS (CONTINUED)

- q. Approved erosion control measures are to be installed and functional during the rainy season from October 15 to April 15. Justify design with hydrology and hydraulic calculations. Submit 3 copies of an erosion control plan and a cost summary of erosion control facilities.
- r. Show detail on plan how finished grades meet adjoining property.
- s. Show on title sheet of plans name, address, and telephone number of:
 - ____ Owner ____ Civil Engineer
 - ____ Architect ____ Soil Engineer
 - ____ Paleontologist ____ Eng. Geologist
 - ____ Archaeologist
- t. Call out bench mark and bearing reference point based on Orange County Survey vertical datum and recorded map or survey, respectively.
- u. The percent grade of the driveway shall be shown on the plan.
- v. Leach field/seepage pits must be plotted on the grading plan.
- w. There may be additional comments after pre-inspection has been conducted. The pre-inspection is a field verification that the plans and soils report accurately reflect existing conditions.
- x. Attach pertaining sheets from the "preliminary" plan to each set of "precise" plans.
- y. The grading concept proposed appears to require a separate Site Development Permit. Verify with EMA/Planning - Development Planning Division/Current Planning at STATION 2, Room G-12. If not required, please provide name of Planner at STATION 2 who made determination and date of determination.

IV. DRAINAGE

- a. 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. (Form enclosed)
- b. Submit a hydrology study and/or hydraulic calculations for _____

- c. Show limits of Flood Plain and finish floor elevations per FP-2 requirements. Subdivision/Drainage Section will verify required minimum finish floor elevation.
- d. Show existing off-site terrace and drainage features that could significantly affect the project.
- e. A berm, 12" high by 4' wide is required at tops of all slopes. Illustrate with typical detail.
- f. Provide 1 copy of CC&R's outlining drainage rights and maintenance responsibilities.
- g. Show location and provide details for all subdrain systems 1) as recommended in the soil/geology report by _____ dated _____ 2) approved standard.
- h. Maximum gradient for sheet flow is 10%.
- i. Minimum, acceptable gradients:
 - 1. Earth.....1.0%
 - 2. Asphaltic Concrete.....1.0%
 - 3. Concrete in earth.....0.5%
 - 4. Concrete in A.C.....0.28%
 - 5. Lots sales and preliminary Grading.....2.0%
 - 6. Terrace drains.....6.0%
- j. Show plan and section details of typical lot drainage. Minimum 2%, maximum 21% away from a building pad to a swale is required. The minimum 2% is required irregardless of surface, i.e., paving.
- k. Drainage shall be conducted to a street, natural watercourse, or other approved location.
- l. Drainage over a manufactured slope is not permitted except in approved devices.
- m. Show limits of roof gutters and location of down spouts.

IV. DRAINAGE (CONTINUED)

- n. Interceptor drains (brow ditches) at top of manufactured slopes are required to intercept surface drainage. Show on plans and provide detail.
- o. Cut off walls are required at inlet of paved drains. Show detail on plans.
- p. Velocity reducers (i.e., energy dissipaters) are required where drains discharge onto natural ground. If riprap is to be used, specify class and size. Show plan and provide detail.
- q. Concentrated drainage exceeding 4% gradient requires concrete, gunite, or other approved non-erosive device.
- r. Revise plans to show complete details of all drainage structures, i.e., _____
- s. Provide concrete device in asphalt section to carry concentrated water.
- t. Show detail and locations of extra depth footings.
- u. Provide 7' setback from top of slope to building to accommodate graded drainage swale or 5' setback when an approved drainage device is used; lots _____
- v. Show flow line elevations of all swales and other drainage devices.
- w. Show retaining wall subdrain details with disposal points, flow line elevations and pipe material.
- x. Show typical section of driveway and/or pavement section. Include type of surfacing material.

V. SLOPES

- a. Provide setbacks as outlined in the grading and excavation code. See check print for specific non-compliance.
- b. Show detail of typical slope benching preparatory to fill placement.
- c. Provide a minimum 6' wide terrace at maximum 30 foot intervals measured vertically, Minimum paved width to be 5' width 18" depth (flow line to top of paved conc.).
- d. Provide a minimum 12' wide terrace if slope exceeds 60 feet in height. Lowest terrace should be 12' wide when only two terraces are required. Show section detail.
- e. Terraces are required in accordance with the Orange County Grading Code for any slope steeper than 10% unless the soils engineer can justify steeper slopes without terracing due to non-erosive character of soils. For slopes steeper than 20% (5:1), elimination of terracing will require Building Official approval.
- f. A downdrain shall be installed for every single run of terrace drain that collects run-off from a slope watershed area of 13,500 sq. ft.
- g. Show on plans the proposed location and fully dimensioned cross sectional details of all buttress fills recommended by the project soil engineer and/or engineering geologist.
- h. Show top and toe of cut and fill slopes.
- i. Incorporate the following hillside design criteria or justify in writing why it does not apply to your project:
 - 1. Slope rounding.
 - 2. Slope contouring at daylight line.
 - 3. Undulating slopes with a minimum of long, flat, inclined planes and acute angles.
 - 4. Max. slope height;
Type B - 35 Feet.
Type C - 20 Feet.
 - 5. Ten foot bench exclusive of drainage facilities.
 - 6. Manufactured (cut and fill) slopes shall have a maximum slope ratio of 2:1 (26 degrees).

VI. GEOTECHNICAL

- a. Soils and geology report must be approved by County Geotechnical Staff. Reports have been forwarded for their review. County Geotechnical Staff are located at 22931 Triton Way, Laguna Hills, CA 92653
- b. Delineate on the plans and provide details for rock disposal areas as recommended by the project soil engineer.
- c. Delineate areas of overexcavation and recompaction as recommended by the soil engineer. Detail and show volume as separate item. Where depth exceeds 12", soil engineer to verify recommended compaction in his final report.
- d. Your soil report recommends 2 or more options of site development. Show on plan what option is to be used.

VII. ADDITIONAL

APPENDIX B

TECHNICAL GUIDELINES
FOR
SOIL AND GEOLOGY REPORTS

COUNTY OF ORANGE
ENVIRONMENTAL MANAGEMENT AGENCY/REGULATION
GRADING SECTION

Technical Guidelines for Soil and Geology Reports

PREFACE:

The ultimate responsibility for a safe design, construction and maintenance of any grading project rests with the consulting engineers, geologists, contractors, and the owner. Since site conditions and the proposed development plan varies so greatly between projects, EMA recognizes the discretion and judgments that must be used by the consulting professionals. It is, therefore, essential to enhance the general understanding between the permit applicants, consultants, and EMA.

The purpose of these technical guidelines is to inform grading permit applicants and their professional consultants of the basic information looked for by the Environmental Management Agency (EMA) in reviewing preliminary (initial) soil and geology reports for grading permit applications and rough grade compaction reports. The guidelines used for the preparation of this document are:

The Orange County grading and Excavation Code, the Uniform Building Code, the California State Board of Registration policy statement (effective 1/1/79) on adequacy of professional geological work as represented by the guidelines for standards of practice issued by the California Division of Mines & Geology, the Orange County Planning Commission, and Subdivision Committee conditions of approval, the Orange County Subdivision Code, and presently accepted geotechnical engineering and engineering geologic practices.

DESCRIPTION:

The technical guidelines are divided into six parts to distinguish report content for different project types and topographic areas to be developed by grading. The more involved grading projects will encompass, but not be limited to, several parts listed below:

- Part I Single Family Dwellings (flatland) - identifies the report content for precise grading permits on single family dwellings in flatland areas.
- Part II Single Family Dwellings (hillside) - identifies the report content for precise grading permits on single family dwellings in hillside areas (additive to the requirements of Part I).
- Part III Single Family Dwellings (supplemental information) - identifies additional report content which may be needed with Part I and Part II depending on the site conditions and development proposed (additive to the requirements of Parts I and II).

Technical Guidelines for Soil and Geology Reports

Part IV Commercial and Industrial Sites - identifies the report content for precise grading permits on commercial and industrial sites including apartment complexes (additive to the requirements of Part I and applicable items of Part III).

Part V Residential, Commercial and Industrial Subdivisions (tracts and parcels) - identifies the report content for preliminary grading permits of large commercial and industrial subdivisions and preliminary and precise grading permits of residential subdivisions in flatland and hillside areas (additive to the requirements of Part I and applicable items of Parts II and III).

Part VI Rough Grade Compaction Reports - identifies the report content for preliminary and precise grading permit rough grade compaction reports.

Due to particular site conditions, proposed improvements or the policies of testing firms or project consultants, some of these items may be included in subsequent reports on the same project with the conditional approval of EMA.

GRADING PLAN REVIEW REPORT:

A grading plan review report is an evaluation of the conclusions and recommendations in the preliminary soil and geology report as they relate to the proposed grading plan. It is usually required when there are changes in the proposed developments, consulting firms, soil engineer or engineering geologist, an update of the preliminary report or signatures are needed, or the project is a conversion to precise permit application. The grading plan review reports are supplements to the preliminary reports and are an opportunity for the consultants to review the planned development. The purpose is to determine if the preliminary reports are adequate and complete for the presently planned grading and construction on the site and if the conclusions and recommendations still apply to the proposed operations. It is not intended that the soil engineer or engineering geologist approve or disapprove the grading plan, but provides them an opportunity to update the preliminary reports and include additions or qualifications as necessary. The date and name of the person preparing the latest grading plan reviewed should be identified for reference purposes.

PART I: TECHNICAL GUIDELINES FOR PRELIMINARY REPORTS (SOIL REPORTS) ON SINGLE FAMILY DWELLINGS IN FLATLAND AREAS

A. General

1. Signature and RCE number of project soil engineer.
2. Job address.
3. Location description and/or location index map with reference north, scale, etc.

Technical Guidelines for Soil and Geology Reports

4. Description of site conditions (topography, relief, vegetation, man-made features, drainage, and watershed).
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).

B. 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, subdrains, over-excavation/cleanout/uncertified fill areas).
3. Location of all samples taken, surface and subsurface.
4. Groundwater conditions and potential (future natural and artificial seepage effects).

C. Engineering/Material Characteristics and Testing

1. Test methods used, type or condition of samples, applicable engineering graphics and calculations, results of all tests, and sample locations of all test samples.
2. Unified Soil Classification of materials.
3. Material competency and strength.¹
 - a. Field densities (and relative compactions where pertinent) and moisture content.
 - b. Shear strength of foundation material (drained or undrained conditions, effective stress or total stress analysis, in-situ or remolded samples must be identified).
 - c. Consolidation or settlement potential.
 - d. Expansion potential.
4. Maximum density-optimum moisture parameters of proposed fill material if available by Uniform Building Code Standard No. 70-1 or approved equivalent.

Technical Guidelines for Soil and Geology Reports

5. Shrinkage and/or bulking factors.
- D. Foundation Design Criteria
1. Footing depth and width.¹
 2. Criteria for foundation material preparation.¹
 3. Allowable bearing values based on testing.¹
 4. Lateral pressures (active, passive, or at rest conditions) and coefficient of friction.¹
 5. Settlement - total, differential, and rate of settlement.
- E. 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.
- F. Conclusions and Recommendations
1. Ground preparation (clearing, unsuitable material removal, scarification and moisturization).
 2. Fill support:
 - a. Suitability and precompaction of in-situ materials (describe test results and other pertinent data to be used to determine suitability).
 - b. Densification and moisturization or dewatering measures (equipment, surcharge, settlement monitoring, if applicable).
 3. Placement of fill:
 - a. Material approval (on site, imported).
 - b. Methods and standard (Uniform Building Code Standard 70-1, or approved equivalent).
 - c. Testing (minimum 90% relative compaction by U.B.C. Standard 70-2 or equivalent) and frequency of field density testing by vertical intervals and/or volume of fill.
 4. Elimination of cut/fill or other differential transitions beneath improvements.

Technical Guidelines for Soil and Geology Reports

5. Utility trenches:

- a. Backfill specifications and recommendations under structures, pavements and slopes (minimum 90% relative compaction using native materials) vs. landscape and other areas.
6. Provisions for approval inspections and necessary testing during and on completion of grading.
7. Opinion as to adequacy of site for the proposed development. (This opinion should also be summarized in the first part of the report).
8. Other pertinent geotechnical information for the safe development of the site.

PART II: TECHNICAL GUIDELINES FOR PRELIMINARY REPORTS (SOIL AND GEOLOGY REPORTS) SINGLE FAMILY DWELLINGS IN HILLSIDE AREAS

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

A. General

1. Engineering geology report with signature and CEG number of project engineering geologist (generally needed depending on site conditions and proposed developments).
2. Source of base map with date.
3. 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 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.).

B. Field Investigations

1. Geologic map showing: site geology, approximate location of proposed keyways, 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), groundwater conditions, subsidence/settlement features or potential, and other pertinent site characteristics.

Technical Guidelines for Soil and Geology Reports

2. Substantiation of any known gross differences of opinion with recently available geologic reports or published data or maps on site area.

C. Earth Materials (Bedrock and Surficial Units)

1. Unit classification, general lithologic type, geologic age, origin.
2. Unit description and characteristics (in sequence for relative age) including:
 - a. Composition, texture, fabric, lithification, moisture, etc.
 - b. Pertinent engineering geologic attributes (clayey, weak, loose; alignments, fissility, planar boundaries; pervious or water-bearing parts; susceptibility to mass wasting, erosion, piping, or compressibility).
 - c. Distribution, dimensions, or occurrence (supplemental to data furnished on illustrations).
 - d. Suitability as construction and foundation material.
 - e. Effects and extent of weathering (existing and relationship to project design and future site stability, material strength, etc.).

D. Geologic Structure

1. General structure
2. Distribution of structural features including position, attitude, pattern and frequency of:
 - a. Fissures, joints, shears, faults and other features of discontinuity.
 - b. Bedding, folds, and other planar features.
3. 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.
4. 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 legend. These sections should correlate with surface and subsurface data showing representative dip components, projections, and stratigraphic/structural relationships.

Technical Guidelines for Soil and Geology Reports

E. 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.
 - a. Surface expression (past and present); permeability/porosity of near surface materials.
 - b. 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.

F. Conclusions and Recommendations (including slope and site stability).

1. Unsuitable material removal (canyon cleanout, over-excavation, etc.).
2. Keyways and benching for existing slopes steeper than 5:1.
3. Specifications for the method of placement and compaction of soil within the zone of the slope face.
4. Slope stability - susceptibility to mass-wasting (creep to rapid failure potential).
 - a. 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.
 - b. 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.
 - c. Favorable or unfavorable inter-relationships of height of existing or proposed slopes to present and future (weathering effects; rate, depth, etc.) strength of earth materials.

Technical Guidelines for Soil and Geology Reports

- d. Slope stability effects onto or from developed, natural, or proposed slopes of adjacent properties.
5. 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.
6. Provisions for necessary inspections of excavations to competent material by the project engineering geologist and/or soil engineer and their approval and/or testing of material competency.
7. Geologic feasibility of the site for the proposed development. (This opinion should also be summarized in the first part of the report).

PART III: TECHNICAL GUIDELINES FOR PRELIMINARY REPORTS (SOIL AND GEOLOGY REPORTS) ON SINGLE FAMILY DWELLINGS: SUPPLEMENT TO PARTS I AND II.

This section includes additional report content that may be necessary depending on project site conditions or proposed developments for either flatland or hillside locations.

A. General

1. Site conditions - distress on existing improvements in area (expansive, settlement/subsidence, or creep areas).
2. Proposed grading - special grading equipment or methods needed for resistant, saturated, or other unusual materials or situations.
3. 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).
4. References to publications and other reports cited.

B. Engineering/Material Characteristics and Testing

1. Shear strength evaluations and results (drained or undrained conditions, effective stress or total stress analysis, in-situ or remolded samples).
2. Expansivity analyses of foundation material (test by U.B.C. Standard No. 29-2 or approved equivalent and classify potential by U.B.C. Table No. 29-C).
3. Material densities and/or penetration tests (Standard Penetration or other methods of known correlation to material density).

Technical Guidelines for Soil and Geology Reports

4. Soluble sulfate content of soils in contact with concrete (test by ASTM D516 or equivalent).
 5. Gradation/size analyses, if appropriate.
 6. Atterberg limit analysis and parameters, if appropriate.
 7. Geophysical survey, if appropriate - graphic and results.
 8. Include all test methods used, type or condition of sample used, applicable engineering graphics and calculations, results of all tests, and sample locations of all test samples.
- C. 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).
1. Gross stability of natural or man-made slopes with calculations, graphics supporting data and applicable parameters.
 2. Surficial stability of slopes with calculations, graphics, supporting data and applicable parameters.
- NOTE: General guidelines for gross stability analyses are provided in "Minimum Standards for Slope Stability Analysis" (Appendix F) formulated by the Los Angeles/ASCE Geotechnical Group Committee on Seismic Stability of Soil and Rock and adopted by the County of Los Angeles on July 25, 1978, except that they shall apply to all slopes steeper than 2:1. Guidelines for surficial stability analyses are established in "Slope Stability Report" formulated by the Orange County Slope Stability Committee dated January 10, 1972.
- D. Seismic evaluation should include regional seismicity: potential for strong shaking, ground rupture, and liquefaction; applicable parameters (peak and/or design ground acceleration, duration of strong shaking site period) or reference to U.B.C. Standards for earthquake design (Chapter 23).
- E. Foundation Design Criteria - Special provision for expansive earth materials.
1. Footing design and placement criteria.
 2. Slab thickness, reinforcement; separation and expansion joints, construction joints, doweling, or ties.
 3. Bridging; grade beam specifications and recommendations, when applicable.
 4. Prestressed (post-tensioned) floatation slab specifications and recommendations, if this system is proposed.

Technical Guidelines for Soil and Geology Reports

5. Exterior flatwork recommendations.
 6. Moisture barriers and/or selective grading (aggregate or sand base or other subbase).
 7. Soil moisture measures
 - a. Treatment prior to concrete pouring: "pre-pour moistening," "pre-soaking," or "pre-saturation".
 - b. Drainage/irrigation controls to maintain moisture content in foundation materials (including increased positive drainage, paving, cut-off walls, sealed planters, gutters and downspouts, etc.).
- F. Foundation Design Criteria - other special provisions
1. Soluble sulfate content specifications and recommendations based on U.B.C. Section 2604 (c)2G.
 2. Footing setback from base of slopes and other setbacks (faults, fracture zones, contacts, etc.).
 3. Effects of adjacent loads when footings are at differing elevations.
 4. Deep foundation systems.
 - a. Allowable bearing values.
 - b. Foundation design criteria, parameters and calculations when applicable.
 - c. Additional loads or potential loads caused by geologic conditions (parameters and calculations).
 5. Engineering calculations with supporting data and applicable parameters used as a basis for recommended values. These will be needed depending on the values presented relative to the foundation materials, groundwater table, proposed improvements and imposed loads.
- G. Retaining Walls: Design Criteria on Proposed Walls (surcharged or greater than 3 feet in height above the base).
1. Slope surcharge and geologic surcharge factors, parameters and calculations.
 2. Drainage and backfill requirements including waterproofing of living areas and suitable drains.
 3. Allowable bearing values, lateral bearing resistance and coefficient of friction based on testing or U.B.C. (Chapter 29).

Technical Guidelines for Soil and Geology Reports

4. Active, passive, or at rest lateral pressure.
5. Footing setback from base of slopes.

H. Conclusions and Recommendations

1. Corrective or selective grading.
2. Subgrade specifications and recommendations.
3. Soil cement or lime stabilization.
4. Rock clast disposal.
5. Blasting.
6. Irrigation/drainage controls, dewatering, surface and subsurface drains and subdrains.
7. Special planting and irrigation measures, slope coverings and other erosion control measures which may be apparent from the preparation of the geotechnical report.
8. Slough walls (including free board on retaining walls).
9. Protection of existing structures during grading.
10. Foundation/wall excavation inspections and approval by engineering geologist and/or soil engineer.
11. Shoring requirements.
12. Actual or potential effects extending into site from adjacent areas or from the site into adjacent areas and recommendations pertaining to stability, erosion, sedimentation, groundwater, etc.
13. Stabilization measures (see note under item C for guidelines and minimums).
 - a. Fill blankets for pads or stabilization blankets for slopes.
 - b. Stabilization fills: specifications (including subdrains and landscape) and parameters (include stability analysis and calculations if geologically surcharged).
 - c. Buttress fills: specifications (including landscape), subdrains, stability analysis with calculations and supporting test data and parameters.
14. Fill over cut slope specifications and recommendations.
15. Subsidence, hydrocompaction and piping potential, factors, time frame and recommendations.

Technical Guidelines for Soil and Geology Reports

PART IV: TECHNICAL GUIDELINES FOR PRELIMINARY SOIL AND GEOLOGY REPORTS ON PRECISE COMMERCIAL/INDUSTRIAL GRADING APPLICATIONS

This section includes the necessary report content in addition to Part I and applicable items of Parts II and III for the proposed commercial/industrial development.

A. Pavement Design (indicate areas and type on geotechnical plan)

1. AC pavement design criteria

- a. R-value testing: method (California 301-f or equivalent), results, sample location(s); or provide minimum AC sections per excavation and grading code.
- b. Traffic indices or projected loading conditions.
- c. AC structural sections: parking areas, service areas, heavy vehicle areas.
- d. Untreated base compaction recommendations (minimum 95% relative compaction).
- e. 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

- a. Minimum thickness and reinforcement
- b. Size of poured or sawed sections; expansion joints.
- c. Untreated base specifications and recommendations.
- d. Subgrade recommendations.

B. Seismic evaluation of site (if site involves a critical or major structure or is in close proximity to an active fault); see Part III for description of necessary content.

PART V: TECHNICAL GUIDELINES FOR PRELIMINARY SOIL AND GEOLOGY REPORTS ON RESIDENTIAL OR COMMERCIAL/INDUSTRIAL SUBDIVISIONS (TRACTS AND PARCELS); FLATLAND OR HILLSIDE AREAS

This section includes necessary report content in addition to Part I and the applicable items of Parts II and III.

A. Seismic evaluation of site (see Part III for description of necessary content).

Technical Guidelines for Soil and Geology Reports

- B. Evaluation of expansivity of site.
- C. Stability evaluation of site; slopes, tract boundary areas, etc.

PART VI: TECHNICAL GUIDELINES FOR ROUGH GRADE COMPACTION REPORTS

A. General

- 1. Signature and RCE number of project soil engineer.
- 2. Job address, lot, and tract number.
- 3. Grading Permit Number.

B. 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.

C. Testing (Compaction)

- 1. Test procedure (field and laboratory).
- 2. Plot plan with the location of all density tests.
- 3. Summary of test results.
 - a. Test identification number.
 - b. Date test performed.
 - c. Maximum dry density.
 - d. Optimum moisture.
 - e. Field dry density.
 - f. Field moisture.
 - g. Relative compaction.
 - h. Approximate elevation of test.
 - i. Approximate finish grade elevation at test site.

Technical Guidelines for Soil and Geology Reports

D. 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.

E. 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 if applicable.

F. As-Built Conditions

1. Plot plan showing limits of the approved compacted fill area (approximate pad elevation, depth of fill, areas of over-excavation, canyon cleanout, keys, and subdrains).
2. Treatment of "daylight" or cut/fill transition zones (extent of over-excavation outside of footing).
3. Type of soil encountered during 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. Comments on changes made during grading and their effect on the recommendations made in the geotechnical report.

G. Recommendations and Opinions

1. Footing recommendations and bearing value on compacted fill.
2. Footing and floor slab recommendations based on results of expansion and soluble sulfate tests (construction details of footing if applicable).
3. Pavement structural section design recommendations and specifications if applicable.
4. Opinion of the suitability of natural soil to support the fill or structure.

Technical Guidelines for Soil and Geology Reports

5. Approval as to the adequacy of the site for the intended use, as affected by soil engineering and/or geologic factors.
6. Opinion as to the gross and surficial stability of all slopes.
7. Opinion as to the suitability of utility trench and retaining wall backfill.
8. A statement that the soil engineering and engineering geologic aspects of the grading have been inspected and are in compliance with the applicable conditions of the Grading Permit and the soil engineer's and engineering geologist's recommendations.

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Footnotes:

1

U.B.C. requirements may be used as an alternative: soil classification of founding materials by U.B.C. Standard No. 29-1 and use minimums and maximums based on U.B.C. Tables 29-A and 29-B or approved equivalent.

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APPENDIX C

PERMIT EXPIRATION
SECTION 303-PERMITS ISSUANCE
OF THE UNIFORM BUILDING CODE
AS AMENDED

PERMIT EXPIRATION, SECTION 303, PERMITS ISSUANCE, OF THE UNIFORM BUILDING CODE AS AMENDED.

Section 303 of said Uniform Building Code is hereby amended to read as follows:

Building Permits

Sec. 302. (a) Issuance. The application, plans and specifications and other data filed by an applicant for a permit shall be reviewed by the Building Official. Such plans may be reviewed by other County departments to verify compliance with any applicable laws and ordinances under their jurisdiction. If the Building Official finds that the work described in an application for a permit and the plans, specifications and other data filed therewith conform to the requirements of this code and other pertinent laws and ordinances, and that the fee specified in Section 304(a) has been paid, he shall issue a permit therefore to the applicant.

When the Building Official issues the permit where plans are required, he shall endorse, in writing or stamp on both sets of plans and specifications, "APPROVED". Such approved plans and specifications shall not be changed, modified or altered without authorization from the Building Official, and all work shall be done in accordance with the approved plans.

The Building Official may issue a permit for the construction of part of a building or structure before the entire plans and specifications for the whole building or structure have been submitted or approved provided adequate information and detailed statements have been filed complying with all pertinent requirements of this code. The holder of such permit shall proceed at his own risk without assurance that the permit for the entire building or structure will be granted.

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

(c) Validity. The issuance or granting of a permit or approval of plans and specifications shall not be construed to be a permit for, or any approval of any violation of any of the provisions of this code or of any other ordinance of the County. No permit presuming to give authority to violate or cancel the provisions of this code shall be valid.

The issuance of a permit based upon plans, specifications and other data shall not prevent the Building Official from thereafter requiring the correction of errors in said plans, specifications and any other data, or from preventing building operations being carried on thereunder when in violation of this code or of any other ordinance of the County.

(d) 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 recommenced, a permit shall be first renewed or obtained to do so, and the fee therefore shall be one-half the amount required for the original permit for such work; provided, however, that:

- (1) No changes have been made in the original plans and specifications for such work, and
- (2) Such suspension or abandonment has not exceeded one year, and
- (3) A re-endorsement of the compliance of the plans with the applicable regulations, by the Environmental Management Agency, shall be obtained.

Any permittee may apply for an extension of the time within which he may commence work under that permit when he is unable to commence 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 180 days upon written request by the permittee showing that circumstances beyond the control of the permittee have prevented action from being taken. Such written request shall be submitted no later than sixty (60) days after expiration of the permit. No permit shall be extended more than once. In order to renew action on a permit after expiration, the permittee shall pay a new full permit fee.

(e) Change of Contractor or of Ownership. A permit issued hereunder shall expire upon a change of ownership or a change of contractor regarding the building, structure, or grading for which said permit was issued if the work thereon has not been completed, and a new permit shall be required for the completion of the work. If the provisions of section (d) above are not applicable and if no changes have been made to the plans and specifications last submitted to the Building Official, no change, other than the permit issuance fee shall be made for the issuance of the new permit under such circumstances. If, however, changes have been made to the plans and specifications last submitted to the Building Official, a permit fee based upon the valuation of the work or the yardage to be completed as provided for in Section 304(a) hereof shall be charged to the permit applicant.

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

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APPENDIX D

SECURITY FORMS

AND

RELATED INSTRUCTIONS

COUNTY OF ORANGE
ENVIRONMENTAL MANAGEMENT AGENCY
REGULATION

GRADING PERMIT CASH BOND*

This agreement is entered into between _____,
hereinafter referred to as "Principal" and 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 _____
Address

NOW, THEREFORE, IT IS AGREED that:

1. Principal does herewith post a cash bond in the amount of
of _____ dollars for which County acknowledges receipt.
2. a) If Principal complies with all the provisions of "the Orange
County Grading and Excavation Code" Article 8 of Division 1 of Title 7 of
of the Codified Ordinances of the County of Orange, commencing with
Section 7-1-800 thereof; and other applicable laws and ordinances; and
b) Complies with all of the terms and conditions of the permit for
excavation or fill to the satisfaction of the Building Official; and
c) Completes all of the work contemplated under the permit withi
time limit specified in the permit, and any extension or extensions
thereof, or completes the work to a safe condition satisfactory to the
Building Official, the cash bond shall be released.
3. a) If principal fails to comply with the aforementioned requirements
the Building Official may order the 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 completio
of this work. After completion of the work, any funds remaining in this
bond shall be refunded to Principal.
c) If the cost of the work exceeds the amount of this bond, Principa
hereby agrees to reimburse County for such excess costs.
d) Principal agrees that if County brings suit to collect for the
work contemplated by this permit, that the 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)

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GRADING PERMIT SECURITY REQUIREMENTS

CASH BOND FORM

I. Instructions for Completing Cash Bond Form

1. Use of this form requires deposit of cash or cashier's check made payable to County of Orange. Personal checks are not acceptable.
2. Attach acknowledgments (see below).
3. After Grading Counter Representative has approved and completed receipt form, submit cash or cashier's check, cash bond form, and receipt form to cashier.

II. Acknowledgments Required

Notarization for signature of principal.

III. Definitions

Principal - Person depositing cash or providing cashier's check.

Grading Permit Application Number - A ten digit number prefixed by GA or GB.

Address - The job address where work is to be performed under the grading permit.

Amount - U.S. dollar bond amount.

Date - (Self-explanatory).

Principal (Notarized Signature) - Signature of principal. Signature must be notarized. (See Item II above, acknowledgments required).

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CERTIFICATE OF DEPOSIT

COUNTY OF ORANGE
EMA/Grading Section

ASSIGNMENT

_____, hereinafter called ASSIGNOR, whose
(NAME)
address is _____, does hereby assign and set over to
County of Orange or its successor jurisdiction hereinafter referred to as ASSIGNEE,
all right, title and interest of whatever nature, of assignor, in and to the insured
account of assignor in the _____ evidence
(Bank or Savings & Loan Association)
by a time certificate of deposit in the amount of \$_____, which is delivered
to the assignee herewith. Assignor agrees that this assignment carries with it the
right in the insurance of the account by the _____
(Appropriate Federal Insurance Agency)
and includes and gives the right to the assignee to redeem, collect, and withdraw
the full amount of such account at any time without notice to the Assignor. Assignor
agrees that this assignment is given as security for the following:

Completion of Grading and Onsite Drainage Improvements at: _____
(Project Address)
and that the Assignee may, without notice to Assignor, redeem, collect and withdraw
the account for the purpose of having not fulfilled the above agreement.

Assignor hereby notifies the above-named _____
(Bank or Savings & Loan Association)
of the assignment.

Dated this _____ day of _____, 199_____.

ASSIGNOR

Grading Permit Application No. _____

Certificate Number _____

RECEIPT FOR NOTICE OF ASSIGNMENT

Receipt is hereby acknowledged to the Assignee of written notice of the
Assignment to said Assignee of the account and certificate identified above.
We have noted in our records the Assignee's interest in said account as shown by
the above assignment and have retained a copy of this document. We hereby certify
that we have received no notice of lien, encumbrance, hold, claim or obligation
of the above-identified account prior to the assignment to the Assignee. We agree
to make payment to the Assignee upon request.

Dated this _____ day of _____, 199_____.

(Bank or Savings & Loan Association)

(Authorized Officer)

Attach Acknowledgments

GRADING PERMIT SECURITY REQUIREMENTS

CERTIFICATE OF DEPOSIT FORM

I. Instructions for Completing Certificate of Deposit Form

1. Certificate to be made payable to assignor.
2. Minimum maturity date shown on certificate shall be six months.
3. Face of certificate needs to state funds will be automatically rolled over after maturity date.
4. Attach acknowledgments (see below).
5. After Grading Counter Representative has approved certificate or passbook format, certificate of deposit form, and completed receipt form, submit original certificate or passbook, certificate of deposit form, and receipt form to cashier.

II. Acknowledgments

1. Notarization for signature of assignor.
2. Notarization for signature of authorized officer of bank or savings and loan association.

III. Definitions

Assignor - Person depositing funds for certificate.

Assignee - The County of Orange.

Address - The mailing address of assignor.

Bank or Savings &
Loan Association - Name of bank or savings & loan association
issuing certificate.

Amount - U.S. dollar amount shown on certificate.

Appropriate Federal Insurance Agency - Name of federal agency
insuring the bank or
savings & loan association
issuing certificate.

Project Address - The job address where work is to be
performed under the grading permit.

Grading Permit Application Number - A ten digit number prefixed by GA
or GB.

Certificate Number - The serial number shown on the certificate.

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GRADING PERMIT SECURITY REQUIREMENTS

GRADING PERMIT SURETY BOND FORM

Use of this form requires Surety and Attorney-in-Fact to be registered with the Probate Department of the Superior Court, County of Orange.

I. Instructions for completing Grading Permit Surety Bond Form:

1. Fill in name of principal, surety company, state of surety company incorporation and bond amount in designated spaces.
2. Fill in grading permit number (same as plan check).
3. Fill in project address including tract and lot number or parcel map number and parcel if applicable.
4. Date form is signed and sealed.
5. Attach Acknowledgments (see below).

II. Acknowledgments Required:

1. Notarization for signature of Principal and/or signature of authorized officer of Principal.
2. Notarization for signature of Attorney-in-Fact of Surety.

III. Definitions:

Principal -	Person or corporation applying for grading permit.
Surety -	Corporation authorized to transact surety business in the State of California.
Grading Permit -	A ten digit number prefixed by GA or GB. Example: GA9202270001
Property -	Property identification indicating the job address where proposed work is to be performed under the grading permit.
Building Official -	The Manager of Development Services Division, Regulation Function, Environmental Management Agency, County of Orange.

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APPENDIX E

SPECIAL INSPECTIONS

SECTION 306-SPECIAL INSTRUCTIONS

OF THE UNIFORM BUILDING CODE

AS AMENDED

SPECIAL INSPECTIONS, SECTION 306, SPECIAL INSPECTIONS, OF THE UNIFORM BUILDING CODE AS AMENDED.

Section 306 of said Uniform Building Code is hereby amended to read as follows:

Special Inspections:

Sec. 306. (a) General. In addition to the inspections to be made as specified in Section 305, the owner shall employ a special inspector during construction on the following types of work.

1. CONCRETE: During the taking of test specimens and placing of all reinforced concrete and pneumatically placed concrete.

EXCEPTIONS: 1. Concrete for foundations conforming to minimum requirements of Table No. 29-A and for Group R, Division 3 and Group M, Division 1, Occupancies, provided the Building Official finds no special hazards exists.

2. For foundation concrete, when the structural design is based on a F_c no greater than 2,000 psi.

3. Non-structural slabs on grade, including prestressed slabs on grade when effective prestress in concrete is less than 150 pounds per square inch.

4. Site work concrete fully supported on earth and concrete where no special hazard exists.

2. DUCTILE MOMENT-RESISTING CONCRETE FRAME. As required by Section 2626(h) of this code.

3. REINFORCING STEEL AND PRESTRESSING STEEL:

A. During all stressing and grouting of prestressed concrete.

B. During placing of reinforcing steel, placing of tendons and prestressing steel for all concrete required to have special inspection by Item 1.

EXCEPTION: The special inspector need not be present during entire reinforcing steel and prestressing steel placing operations, provided he has inspected for conformance with the approved plans, prior to the closing of forms or the delivery of concrete to the job site.

4. WELDING.

A. Ductile moment-resisting steel frames. As required by Section 2722(f) of this code.

B. All structural welding, including welding of reinforcing steel.

EXCEPTIONS: 1. When welding is done in an approved fabricator's shop.

2. When approved by the Building Official, floor and roof deck welding and welded studs when used for structural diaphragm or composite systems may have periodic inspections as defined in

Section 306(e). For periodic inspection, the inspector shall check qualifications of welders at start of work of work and then make final inspection of all welds for compliance prior to completion of welding.

5. HIGH-STRENGTH BOLTING: During all bolt installations and tightening operations.

EXCEPTIONS: 1. The special inspector need not be present during the entire installation and tightening operation provided he has:

- (i) Inspected the surfaces and bolt type for conformance to plans and specifications prior to start of bolting.
 - (ii) And, will upon completion of all bolting, verify the minimum specified bolt tension for 10 percent of the bolts for each "type" of connection, for a representative number of total connections established by the plans and specifications.
2. In bearing type connections when threads are not required by design to be excluded from the shear plane, inspection prior to or during installation will not be required.
3. When bolting is done in an approved fabricator's shop.

6. STRUCTURAL MASONRY: During preparation of masonry wall prisms, sampling and placing of all masonry units, placement of reinforcement, inspection of grout space immediately prior to closing of cleanouts, and during all grouting operations. Where the f'm is less than 2,600 psi and special inspection stresses are used, test specimens may consist of either one prism test for each 5,000 square feet of wall area or a series of tests based on both grout and mortar for the first three consecutive days and each third day thereafter.

EXCEPTION: Special inspection will not be required for structures designed in accordance with the values in appropriate Tables for non-continuous inspection.

7. REINFORCED GYPSUM CONCRETE: When cast-in-place Class "B" gypsum concrete is being mixed and placed.
8. INSULATING CONCRETE FILL: During the application of insulating concrete fill when used as part of a structural system.

EXCEPTION: The special inspection may be limited to an initial inspection to check the deck surface and placement of reinforcing. The special inspector shall supervise the preparation of compression test specimens during this initial inspection.

9. SPRAYED-ON FIREPROOFING: As required by U.B.C. Standard No. 43-8.
10. PILING, DRILLED PIERS AND CAISSONS: During driving and testing of piles and construction of cast-in-place drilled piles or caissons. See Items 1 and 3 for concrete and reinforcing steel inspection.

APPENDIX F

MINIMUM STANDARDS FOR SLOPE STABILITY ANALYSIS

(LA/ASCE Geotechnical Group Committee on
Seismic Stability of Soil and Rock)

MINIMUM STANDARDS FOR SLOPE STABILITY ANALYSIS

The following minimum standards for slope stability analysis will generally be required for fill slopes steeper than 2:1 [Section 7010 (c)] and cut slopes steeper than 1-1/2:1 [Section 7009 (a)]. A more detailed field and laboratory investigation combined with a seismic stability analysis utilizing such information may be required where unusual soils or geologic conditions exist.

1. Separate calculations shall be performed for static and seismic conditions.
2. The pseudostatic 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 pseudostatic loads.
4. The minimum acceptable factor of safety on shear strength is 1.5 for static loads, and 1.1 for pseudostatic 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. A minimum pseudostatic horizontal inertial force equal to 0.15 times the total weight of the potential sliding mass shall be used. This minimum lateral design value should be increased where subsurface conditions or the proximity to active faults warrants the use of higher values in the opinion of the private consultant(s).
8. The critical potential failure surface used in the analysis may be composed of circles, planes or other shapes considered to yield the minimum factor of safety against sliding and most appropriate to the soil and geologic site conditions. 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 pseudostatic case.

10. Soil properties including unit weight and strength parameters (cohesion and 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 values of the weakest unsupported plane. It is expected that the engineer 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 pseudostatic analysis shall not exceed peak point static strengths unless supported by dynamic test results or other convincing physical evidence.
11. In the design of slope support, bedding planes flatter than 12 degrees from the horizontal need not normally be considered in a pseudostatic analysis.
12. 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 at lease include the following items:
 - a. Boring logs and plan locations relative to the proposed grading.
 - b. Geotechnical description of soil and/or rock 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: 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.
 - c. Groundwater conditions encountered at the site as well as anticipated future groundwater conditions that may affect the design.
 - d. 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.
 - e. Shear strength parameters for design which are based on field experience should be properly referenced or explained.
13. All design parameters shall be verified during construction. This includes applicable geologic structures such as bedding attitudes, joint orientation and existing shear surfaces - fill strength, and groundwater conditions. If any significant variation from the design values is discovered, revised calculations shall be made and submitted.

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APPENDIX G

PROTECTION OF ADJACENT PROPERTY
CALIFORNIA CIVIL CODE-SECTION 832

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 * * * nine feet below the adjacent curb level, at the point where the joint property line intersects the curb and if on the land of the coterminous owner there is any building or other structure 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 thereof, from any damage by reason of the excavation, and shall be liable to the owner of such property for any such damage, excepting only for minor settlement cracks in buildings or other structures.

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