City of Dana Point
Public Works & Engineering Services Department

Brad Fowler, Director
Matthew Sinacori, City Engineer

Grading Manual 2006 Edition

Dana Point City Council

Wayne Rayfield
Mayor

Lara Anderson
Mayor Pro Tem

James V. Lacy
Council Member

Diane L. Harkey
Council Member

Russ Chilton
Council Member

TABLE OF CONTENTS

SUBARTICLE I GENERAL PROVISIONS 1

1.1 AUTHORITY 1

1.2 SCOPE AND PURPOSE 1

1.3 REVISION 1

SUBARTICLE 2 DEFINITIONS 2

2.1 DEFINITIONS 2

SUBARTICLE 3 PERMITS REQUIRED 5

3.1 PERMITS REQUIRED 5

SUBARTICLE 4 ORGANIZATION AND ENFORCEMENT 6

SUBARTICLE 5 GRADING PERMIT REQUIREMENTS 7

5.1 RELEASE FROM PLANNING PRIOR TO SUBMITTAL TO ENGINEERING DEPARTMENT 7

5.2 APPLICATION SUBMITTAL CHECK LIST 7

5.4 EMERGENCY SLOPE REPAIR SUBMITTAL REQUIREMENTS 9

5.5 GRADING PLAN CHECK 9

5.6 SOIL AND ENGINEERING GEOLOGY REPORT CONTENT 11

5.7 PERMIT ISSUANCE 13

5.8 PERMIT EXPIRATION 13

5.9 TRANSFER OF RESPONSIBILITY FOR APPROVAL 13

SUBARTICLE 6 FEES 14

6.1 PLAN CHECK FEES 14

6.2 INSPECTION FEES 14

6.3 EMERGENCY WORK; COST RECOVERY FEES 14

SUBARTICLE 7 BONDS 16

7.1 TYPES OF SECURITY 16

7.2 SECURITY AMOUNT 16

7.3 TERM AND RELEASE OF SECURITY 16

7.4 SUBSTITUTION AND REDUCTION 17

SUBARTICLE 8 CUTS 18

8.1 CUT SLOPES 18

SUBARTICLE 9 FILLS 19

9.1 FILL LOCATION 19
9.2 PREPARATION OF GROUND 19
9.3 FILL MATERIAL 19
9.4 COMPACTION 20
9.5 SLOPE 21
9.6 UTILITY LINE BACKFILL 21
SUBARTICLE 10 SETBACKS 23
10.1 SETBACKS FROM PERMIT AREA BOUNDARY 23
10.2 DESIGN STANDARDS FOR SETBACKS 23
10.3 RETAINING WALLS 23
SUBARTICLE 11 DRAINAGE AND TERRACING 26
11.1 ADOPTION OF ORANGE COUNTY LOCAL DRAINAGE MANUAL AND ORANGE COUNTY HYDROLOGY MANUAL 26
Hydrology and hydraulic design criteria shall be per the Orange County Hydrology Manual and the Orange County Local Drainage Manual, respectively. Per the Orange County Local Drainage Manual, all Building Pads shall be protected from the 100-year storm inundation. 26
11.2 TERRACES 26
11.2 SUBSURFACE DRAINAGE 26
11.3 DISPOSAL 27
11.4 INTERCEPTOR DRAINS 28
11.5 PIPE SPECIFICATIONS 28
11.6 AREA DRAIN GRATES 30
11.7 CONDUITS BENEATH STRUCTURES 30
11.8 PIPE INSTALLATION 30
11.9 HYDRAULIC CAPACITY 30
11.10 BLUFF DRAINS PROHIBITED 30
SUBARTICLE 12 ASPHALT CONCRETE PAVEMENTS 31
12.1 ASPHALT CONCRETE AND UNTREATED BASE STANDARDS 31
12.2 SUBGRADE COMPACTION 32
12.3 SOIL STERILIZATION 32
12.4 SURFACE DRAINAGE 32
12.5 PAVEMENT STRUCTURAL SECTION 32
12.6 DRIVEWAYS 33
SUBARTICLE 13 EROSION CONTROL 34

13.1 INFORMATION ON EROSION CONTROL PLANS 34
13.2 APPROVAL OF EROSION CONTROL LANDSCAPING 34
SUBARTICLE 14 GRADING INSPECTION 35
14.1 SITE INSPECTION BY THE DIRECTOR 35
14.2 SPECIAL INSPECTIONS 37
14.3 ALTERNATE MATERIALS AND METHODS OF CONSTRUCTION 38
SUBARTICLE 15 COMPLETION OF WORK 39
15.1 FINAL REPORTS 39

APPENDICES

APPENDIX A: ***TECHNICAL GUIDELINES FOR SOIL AND GEOLOGY REPORTS***

APPENDIX B: ***DANA POINT MUNICIPAL CODE SECTION 8.01***
"Grading & Excavation Control"

APPENDIX C: ***CITY COUNCIL RESOLUTION 98-01-13-05***
"Fee Structure"

APPENDIX D: ***SURETY FORMS***

APPENDIX E: ***DANA POINT MUNICIPAL CODE SECTION 9.35.050***
"Driveways"

APPENDIX F: ***DUTIES OF THE SPECIAL INSPECTOR***
"Section 1701 Section 306 Special Inspections, of the Uniform Building Code"

APPENDIX G: ***GRADING PERMIT PROCESS HANDOUT***

APPENDIX H: ***MINIMUM STANDARDS FOR SLOPE STABILITY ANALYSIS***

APPENDIX I: ***STANDARD CERTIFICATION FORMS***

DANA POINT GRADING MANUAL
PUBLIC WORKS & ENGINEERING SERVICES DEPARTMENT

SUBARTICLE I GENERAL PROVISIONS

1.1 AUTHORITY

The Dana Point Grading Manual (hereinafter referred to as "Grading Manual") is required by Section 8.01.020 of the Dana Point Municipal Code, and was developed to regulate grading activities in the City of Dana Point.

1.2 SCOPE AND PURPOSE

The Grading Manual is a compilation of rules, procedures and interpretations necessary to carry out the provisions of the Dana Point Grading and Excavation Code, as outlined in Chapter 8.01 of the Dana Point Municipal Code. The Grading Manual is organized to follow the content of subarticles in the Grading and Excavation Code.

The purpose of the Grading Manual is to assist users of the Grading and Excavation 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 the City of Dana Point.

It is the intent of the Director of the Public Works & Engineering Services Department (hereinafter referred to as "Director") and the City Engineer 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 and the City Engineer. Any person seeking to initiate a revision shall submit a written request accompanied by pertinent supportive data to the Director and the City Engineer. At such time as the Director 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 of Public Works & Engineering Services and the City Engineer. Emergency situations may be handled differently insofar as other legal constraints permit. Requests of this nature shall be initiated by correspondence with the Director.

SUBARTICLE 2 DEFINITIONS

2.1 DEFINITIONS

The definitions contained in this subarticle are supplemental to those contained in the Grading and Excavation Code. They are helpful in interpreting the meaning of the Grading and Excavation 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 mailer, 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 ± 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.

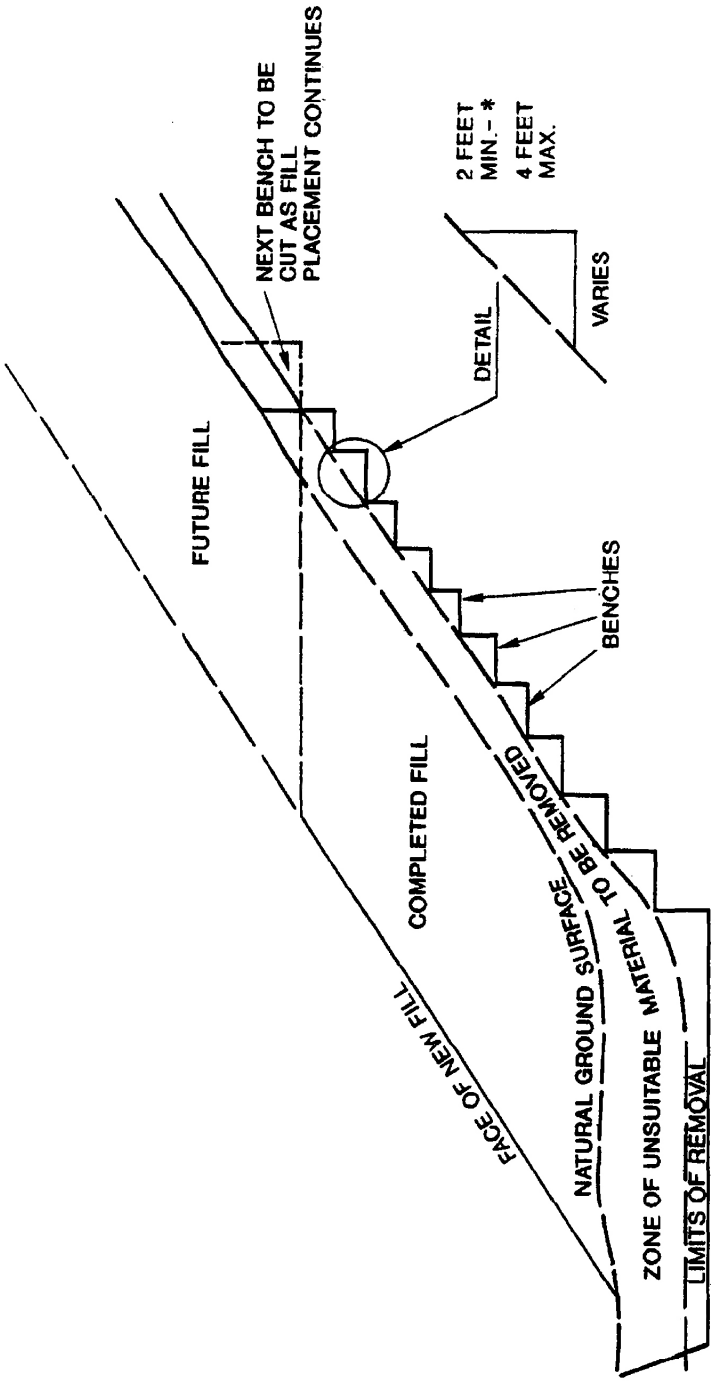
RETAINING STRUCTURE is a wall or other device designed to resist lateral pressure.

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

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.



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

Figure 1

SUBARTICLE 3 PERMITS REQUIRED

3.1 PERMITS REQUIRED

Permits are required by Section 8.01 Article 3 of the Dana Point Municipal Code (See Section 8.01 of the Dana Point Municipal Code).

Permits shall be required for the following activities*:

- Grading, clearing, brushing, or grubbing
- Paving over 3,000 square feet
- Alteration of an existing watercourse, channel, or revetment by excavating, or placing fill, rock protection or structural improvements
- Any construction for which a building permit is required
- Stockpiling of soil on a lot or parcel
- Possession, storage, sale, transport or use explosives and blasting agents to do any excavation
- Emergency Slope Repair (See Section 5.4 for details)

*Exemptions are included in Chapter 8, Article 3 of the Dana Point Municipal Code.

SUBARTICLE 4 ORGANIZATION AND ENFORCEMENT

RESERVED

SUBARTICLE 5 GRADING PERMIT REQUIREMENTS

5.1 RELEASE FROM PLANNING PRIOR TO SUBMITTAL TO ENGINEERING DEPARTMENT

Prior to submitting grading plans to the Public Works and Engineering Department, the applicant shall submit a site plan for discretionary approval to the Planning Department. Depending on the scope of work, additional permits from the Planning Department may be necessary. Applicant must obtain approval from the Planning Department, including the completion/approval of any discretionary review permits, prior to submitting to the Public Works & Engineering Department.

5.2 APPLICATION SUBMITTAL CHECK LIST

Initial submittal requirements for a grading permit review are listed herein.

The following items are required at the time of grading application submittal to the Public Works and Engineering Department and shall be separate from any other submittal to the Planning or Building Department. No partial submittal shall be accepted.

- ***Provide an application*** with an address assigned by Engineering Department.
- Three (3) wet-signed sets of ***Grading Plans*** prepared by a Registered Civil Engineer OR Licensed Architect.
- Three (3) wet-signed sets of ***Drainage and Erosion Control Plans*** prepared by a Civil Engineer.
- Three (3) copies of the completed ***Urban Runoff Threat Prioritization Form***.
- One (1) copy of a ***BMP Report****
- Three (3) copies of the completed ***Construction & Demolition (C & D) Ordinance Form***.
- Three (3) copies of a ***current preliminary Title Report*** (not older than six months) *(per Dana Point Municipal Code §9.61.040)*
- Three (3) wet-signed copies of a ***preliminary Soils Report***.
- Three (3) wet-signed copies of an ***Engineer's cost estimate*** subdivided into the following categories:
    a. Grading
    b. Private Improvements (Paving, drainage, etc.)
    c. Public and private Street and Drainage Improvements
    d. Erosion Control Improvements
- Provide a copy of the ***Conditions of Approval*** for the project, if they were issued by the Planning Department.
- ***Plan check and C&D fees (Cash or check)*** (See Subarticle 6 for

fees).

- Signature of property owner on cover sheet of Grading Plans.

* For more information on BMP reports please visit:

http://www.danapoint.org/publicworks/EngineeringPermits/EngineeringPermits.htm

5.3 APPLICATION SUPPLEMENTAL SUBMITTALS

The following items ***MAY*** be required to complete the application depending on the required permit:

- Three (3) sets of hydrology and hydraulic calculations.
- Three (3) sets of Geological Report.
- Three (3) sets of retaining wall structural calculations.
- Three (3) sets of a Soils report(s) addressing retaining wall design parameters.
- Three (3) sets of Landscape and Irrigation Plans.
- Three (3) sets of Special Erosion Control Plans.
- Three (3) copies of approved EIR, Negative Declaration, or an approved exemption per the California Environmental Quality Act.
- Three (3) sets of Precise Grading Plan.
- Three (3) copies of the approved Tentative Map if subdivision of parcel applies.
- Three (3) copies of the Final Map if subdivision of parcel applies.
- Three (3) copies of Street Improvement Plans.
- Notarized letter of consent for grading on adjacent property, when work will impact adjacent owners, and all applicable easement(s).
- Record of consent for drainage onto adjacent property, if applicable

In addition, the following Agency permits ***MAY*** be required prior to the issuance of a grading permit depending on the scope of work:

- Fire department approval
- California Department of Fish and Game permit
- California Coastal Commission permit
- Army Corp. of Engineers permit
- Division of Dam Safety permit
- All other Agency approvals

Notification shall be provided to the applicant at the time of the application submittal or after a pre-inspection of the site if any of the above items are required to complete the application package.

5.4 EMERGENCY SLOPE REPAIR SUBMITTAL REQUIREMENTS

In the event that the Director classifies work as an "Emergency Slope Repair", the property owner shall be required to submit the following documents for review and approval to the Public Works and Engineering Department:

- ☐ Completed Public Works and Engineering Department general application
- ☐ Geotechnical investigation of the site including:
  - Slope stability analysis
  - Remediation measures/recommendation
  - Site plan clearly illustrating the proposed emergency work.

5.5 GRADING PLAN CHECK

Plans submitted for plan check shall be drawn to scale with black ink upon 20lb white bond paper 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. Additionally, each sheet of the grading plan set shall be wet-stamped and wet-signed by the engineer of work. The title sheet of said plans shall also be wet-signed and wet-stamped by the project soil engineer. No plan sheet shall exceed 24x36 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 twenty five (25) 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. List the amount of proposed import and export on the plan cover sheet.

If the grading project includes the movement of earth material to or from the site in an amount considered substantial by the Director or in excess of 5,000 cubic yards as specified in Section 8.01.280 of the Dana Point Municipal Code, the permittee shall submit the haul route for review and approval by the Public Works & Engineering Services Department / 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 Director shall prescribe as a condition of the grading permit.

Additional plans, drawings, calculations, environmental impact information, or other reports may be required by the Director.

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. Flow lines 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. A note on the plans (if applicable) stating, “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.”

5.6 SOIL AND ENGINEERING GEOLOGY REPORT CONTENT

Technical Guidelines for Soil and Geology Reports are provided herein as Appendix 'A'.

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 subdivisions both commercial/industrial, multi- residential and similar developments involving structures and/or earthwork for which a grading permit is required. Soils reports shall also be required for grading or building permits on single lot projects when specified by the Director.

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;
- Design of subsurface drainage required for the stability and protection of adjacent properties from the influence of groundwater; and
- Shall provide other recommendations, as necessary, to 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:
- Comprehensive description of the site topography and geology;
- 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;
- Description of the field investigation and findings;
- Conclusions regarding the effect of geologic conditions on the

proposed development;

- Specific recommendations for plan modification, corrective grading and/or special techniques and systems to facilitate a safe and stable development, and
- Shall provide other recommendations as necessary, commensurate with the project grading and development.

The preliminary engineering geology report may be combined with the soil engineering report.

c. Seismicity Report:

(Required if the project is within an A Earthquake Fault Hazard Zone)

A seismicity report shall be required as a condition for issuance of a grading permit and Building Permit for all subdivisions (tracts) and all sites for critical structures (fire stations, nursing homes, etc.) and major structures, as determined by the Director. 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 Director.

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.

Information of active or potentially active fault zones may be found on the State of California website at the link listed below:

http://www.consrv.ca.gov/CGS/rghm/ap/Map_index/index.htm

d. Final Reports:

A rough grade certification from the civil engineer, as well as compaction reports shall be required prior to rough grade sign off. Additionally, a final civil engineering certification and final soil and engineering geology reports shall be submitted in accordance with Subarticle 15 of this Grading Manual prior to final sign off of the grading permit.

5.7 PERMIT ISSUANCE

Where a Tentative Tract Map or Tentative Parcel Map is required, a preliminary grading permit may not be issued until after approval of a Tentative Tract or Tentative Parcel Map, unless otherwise approved by the Director.

5.8 PERMIT EXPIRATION

The time limitations and provisions of Section 8.01.230 of the Dana Point Municipal Code are included in Appendix 'B', "Grading & Excavation Control"

5.9 TRANSFER OF RESPONSIBILITY FOR APPROVAL

If the civil engineer, the soil engineer, the engineering geologist, the testing agency, or the grading contractor of record are changed during the course of the work, the work shall be stopped unless: (1) the owner submits a letter of notification verifying the change of the responsible professional; and (2) the new responsible professional submits in writing that that person has reviewed all prior reports and/or plans (specified by date and title) and work performed by the prior responsible professional and that the professional concurs with the findings, conclusions, and recommendations, and is satisfied with the work performed. The professional person may modify or revise recommendations, specifications or work performed if accompanied by supporting data and approved by the Director. The professional must state that the professional assumes all responsibility within that person's professional purview as of a specified date. All exceptions must be justified to the satisfaction of the Director.

Exception: Where clearly indicated that the firm, not the individual engineer and/or geologist, is the contracting party, the designated engineer or geologist may be reassigned and another engineer and/or geologist within the firm may assume responsibility.

(See Section 8.01.444 of the Dana Point Municipal Code, included herein with Appendix 'B').

SUBARTICLE 6 FEES

6.1 PLAN CHECK FEES

Before accepting a grading permit application and plans and specifications for checking, the Director shall collect a plan-checking fee as approved by Council City Council Resolution No. 98-01-13-05 on January 1, 1998; by City Council Resolution No. 05-07-13-09 approved on July 13, 2005; and those supplements as may be adopted by resolution of the City Council. The aforementioned resolutions are included in Appendix 'C'.

City Council Resolution No. 05-07-13-09 approved the review of grading plans with less than 500 cubic yards of cut or fill (whichever is greater) to be on a time and materials basis. An initial deposit of $500.00 and an administrative fee of $98 is due at the time of plan check submittal. The time is charged against the deposit and any additional fees are due at the time comments are returned or at permit issuance, whichever comes first.

For grading plans with 500 cubic yards or greater of cut or fill (whichever is greater), the fee schedule included within Resolution No. 98-01-13-05 shall apply for both grading and improvements (see Appendix 'C').

6.2 INSPECTION FEES

Before issuing grading permit, the Director shall collect an inspection fee as approved by Council City Council Resolution No. 98-01-13-05 on January 1, 1998; by City Council Resolution No. 05-07-13-09 approved on July 13, 2005; and those supplements as may be adopted by resolution of the City Council. The aforementioned resolutions are included in Appendix 'C'.

City Council Resolution No. 05-07-13-09 approved the inspection of grading plans with less than 500 cubic yards of cut or fill (whichever is greater) to be on a time and materials basis. An initial deposit of $350.00 is due at the time permit issuance. The time is charged against the deposit and any additional fees are due prior to final sign-off of the grading permit.

For grading plans with 500 cubic yards or greater of cut or fill (whichever is greater), the fee schedule included within Resolution No. 98-01-13-05 shall apply for both grading and improvements (see Appendix 'C').

6.3 EMERGENCY WORK; COST RECOVERY FEES

Per Section 8.01.310 of the Dana Point Municipal Code, if the Director performs or causes the performance of emergency or other work on private property, the Director shall charge the property owner all direct and indirect costs which are necessary to complete the work to the Director's satisfaction. In addition, the City

may charge a mobilization cost equal to ten percent (10%) of the cost for performing the work. (Added by Ord. 98-03, 3/10/98; amended by Ord. 03-04, 2/12/03; Ord. 03-18, 12/10/03)

SUBARTICLE 7 BONDS

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 Director with the concurrence of City Council, when necessary.

Examples of security forms are found in Appendix 'D'.

7.2 SECURITY AMOUNT

Section 8.01.320 of the Dana Point Municipal Code allows the amount of a grading security to be determined by the Grading Manual. Therefore, 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 Director 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 Director 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 Director. For completion of work requirements, see Subarticle 15 of the Grading Manual. Security release shall be accomplished by written notification to the permittee from the Director. In the case of a preliminary grading permit where maintenance of erosion control devices is required, the security release will not occur until the entire site has been converted to a precise grading 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 grading permit security will be released upon completion of preliminary grading 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 Director 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 Director, 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 or the City Council 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.

The faces of cut slopes shall be prepared and maintained to control against erosion in accordance with Subarticle 13 and Section 8.01.380 of the City of Dana Point Municipal Code. Where cut slopes are not subject to erosion due to the erosion-resistant character of the materials, such protection may be omitted upon approval by the Director.

The surface of all cut slopes more than 5 feet in height shall include appropriate landscaping for erosion-control purposes as approved by the Planning Department as outlined in the Section 7.08.120 “Landscaping and Screening” of the City of Dana Point Municipal Code.

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 Director.

9.2 PREPARATION OF GROUND

The ground surface shall be prepared to receive fill by removing vegetation; non-complying 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 Director. 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 (or 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, or as stipulated by the project geotechnical engineer or soils engineer, no rock or similar irreducible material with a maximum dimension greater than twelve (12) inches shall be buried or placed in fills.

The Director 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 Director 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 or as specified in Appendix 'A', Part IV of this manual as determined by Test Method ASTM D1557, Appendix Chapter 33 of the Uniform Building Code or equivalent, and as approved by the Director. Field density shall be determined in accordance with the standards listed in Section 3305 of the Uniform Building Code or equivalent, as approved by the Director.

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 accepted in Section 8.01.340, "Fills" of the Dana Point Municipal Code and where the Director 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. 18-I-B, "Classification of Expansive Soil" of the Uniform Building Code exist, lesser compaction may be granted by the Director 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 ASTM D1557 Appendix Chapter 33 of the Uniform Building Code 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 Director, 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 or the City Council 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.

The faces of fill slopes shall be prepared and maintained to control against erosion in accordance with Subarticle 13 and Section 8.01.380 of the City of Dana Point Municipal Code. Where cut slopes are not subject to erosion due to the erosion-resistant character of the materials, such protection may be omitted upon approval by the Director.

The surface of all fill slopes more than 5 feet in height shall include appropriate landscaping for erosion-control purposes as approved by the Planning Department as outlined in the Section 7.08.120 “Landscaping and Screening” of the City of Dana Point Municipal Code.

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 Director 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 of this manual, 18-I-1 of the Uniform Building Code, and the Dana Point Municipal Code. Setbacks may be reduced to those shown on Figure 2 upon qualification from the soils engineer and/or geologist and approved by the Director and so long as they are still in compliance with the City of Dana Point Municipal Code.

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; to prevent damage as a result of water runoff, erosion or maintenance of the slopes; and in accordance with Figure 18-I-1 ”Setback Dimensions” of the Uniform Building Code

Unless otherwise approved by the Director, based on recommendations in the approved soil engineering and/or engineering geology report on the approved grading plan, setbacks may reduced to those shown on 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 Director. However, retaining walls fall under the jurisdiction of the Building Department and will require a separate review and separate permit. Detailed information on submittals and submittal requirements can be obtained by contacting the Building Department at (949) 248-3594.

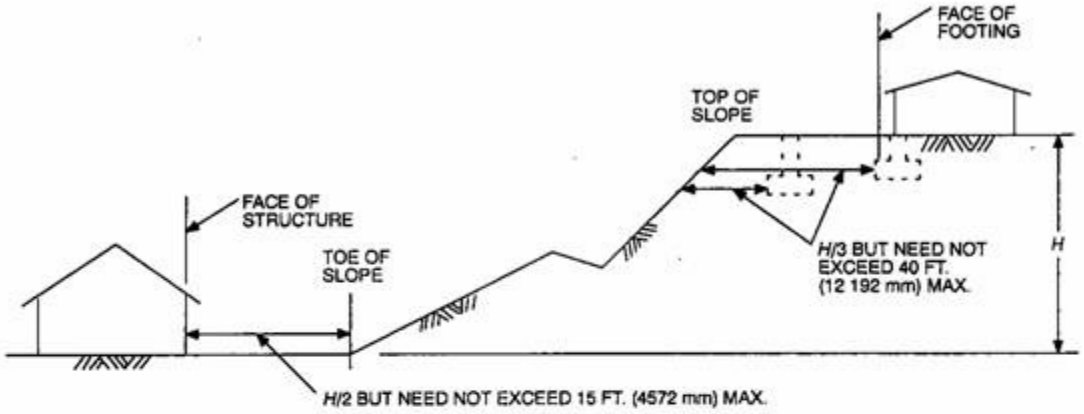
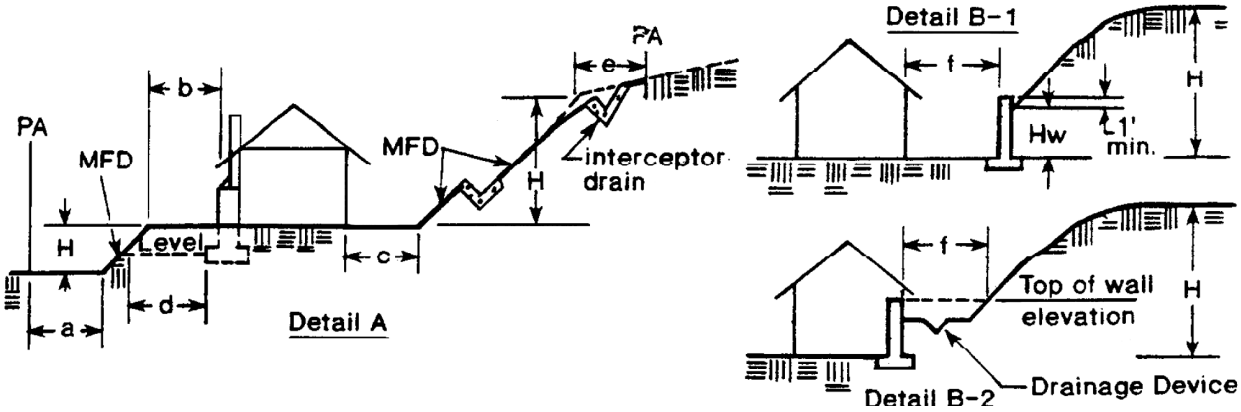


FIGURE 18-I-1—SETBACK DIMENSIONS

FIGURE 2



MINIMUM SETBACK FROM ADJACENT SLOPE					
H (ht.) 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 (ht) Feet	Maximum Hw	Minimum Setback f
0-6	3'	3' Minimum
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 and building regulations.
3. Table A applies to manufactured slopes and 2:1 or steeper natural slopes. Setbacks from natural slopes flatter that 2:1 shall meet the approval of the Building Official.
4. "b" may be reduced to 5' minimum if an approved drainage device is used; roof gutters and downspouts may be required.
5. "b" may be reduced to less 5' if no drainage is carried on this side of the 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 on 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 the 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 the reduction 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 ADOPTION OF ORANGE COUNTY LOCAL DRAINAGE MANUAL AND ORANGE COUNTY HYDROLOGY MANUAL

Hydrology and hydraulic design criteria shall be per the Orange County Hydrology Manual and the Orange County Local Drainage Manual, respectively. Per the Orange County Local Drainage Manual, all Building Pads shall be protected from the 100-year storm inundation.

11.2 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 (5:1) 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 (4:1). 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 Director. 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 Director and 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 Director shall 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 Director. The maximum drainage gradient of an earth swale shall be (four) 4 percent.

Grading of nearly horizontal surfaces under a preliminary grading permit shall have a sheet flow drainage gradient of two (2) percent toward approved drainage facilities. The Director 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 as listed above, shall conform to the following minimum drainage gradient standards:

	Minimum Gradient
Earth Swales	1.0%
Earth (sheet flow)	2.0%
Asphalt pavement (sheet flow)	1.0%
Concrete drain in earth area	0.5%
Concrete gutter in asphalt paved area	0.28%

11.4 INTERCEPTOR DRAINS

Paved interceptor drains shall be installed along the top of all manufactured slopes where the tributary drainage area flows toward the slope and has a drainage path to 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 Director.

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 Director. 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 Director.

Approved pipe includes but is not limited to:

a. 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 AS774 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

b. Reinforced Concrete Pipe (RCP)
    D-load to be designed and shown on approved grading plans.

c. Non-reinforced Concrete Pipe
    Pipe shall be extra strength

d. High Density Polyethylene (HDPE) Pipe
    HDPE pipe shall meet the requirements of Section 207-18 of the Standard Specifications for Public Works Construction (SSPCW), and as amended herein (see Section 11.5.2).

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

11.5.1 Polyvinyl Chloride (PVC) Pipe:

All solid wall plastic pipes (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 it 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.

11.5.2 High Density Polyethylene (HDPE) Pipe:

HDPE pipe shall have full circular cross-section and an integrally formed smooth interior.

HDPE pipe shall meet the requirements of AASHTO Specifications M-252 for 3-inch diameter, M-294 for 12-inch to 48-inch diameters and MP-7 for 54-inch and 60-inch diameters. Pipe shall be type ‘S’ or ‘D’ (smooth interior). HDPE Pipe and resin producers shall be certified according to the PPI/CPPA Third Party Certification Program. All corrugated polyethylene pipe shall contain the appropriate program mark, either an official label or permanent affixation prior to shipment.

Joints shall be watertight joints and must meet a 10.8 PSI (74 kPa) laboratory test per ASTM D3212 and utilize a bell and spigot design with a gasket meeting ASTM F477.

Fittings used with the HDPE pipe shall not reduce or impair the overall integrity or function of the pipeline. Fittings may be molded or fabricated and shall be furnished by the pipe manufacturer.

Manufacturer shall provide, when required, a suitable repair coupling certified to provide a watertight seal to 3.5 psi.

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 Director 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 pipe 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 Director.

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 the County of Orange Resources and Development Management Department 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.

In all cases, the building pad shall be protected from the 100-year storm inundation. Therefore, if required by the Director or the City Engineer, calculations shall be provided demonstrating that all pipes, inlets, and storm drain appurtenances have sufficient hydraulic capacity to convey the 100-year storm event runoff to an approved drainage device or outlet.

11.10 BLUFF DRAINS PROHIBITED

Unless otherwise approved by the City Engineer, ground drain pipes along bluffs and slopes steeper than 2:1 are prohibited.

SUBARTICLE 12 ASPHALT CONCRETE PAVEMENTS

12.1 ASPHALT CONCRETE AND UNTREATED BASE STANDARDS

Per the Dana Point Municipal Code Section 8.01.370, "Asphalt Concrete Pavement", asphalt concrete pavement for surfacing of parking lots, private streets or other similar use shall conform to the provisions of Subarticle 12 of the Grading Manual unless otherwise approved by the Director. Said Code Section also includes additional requirements and is included in Appendix 'B' of this manual.

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 Standard Specifications for Public Works Construction (SSPWC) and as amended herein, unless otherwise approved by the Director.

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.

Asphalt concrete material used for AC pavement shall be Class and Grade B-AR-4000, and shall conform to the provisions set forth in Sections 203-6, 302-5 and 400-4 of the SSPWC.

If asphalt concrete pavement is being constructed directly upon an existing hard-surfaced pavement: 1) all holes and cracks 1.5 inches or greater in width shall be filled with asphalt concrete Class and Grade F-AR-4000 compacted level with the top of the existing pavement; 2) all cracks and joints greater than 1/8 inch in size shall be blown clear with high pressure air, with the street swept immediately thereafter; and 3) all joints and cracks greater than 1/4 inch and less than 1.5 inches in size shall be filled with Crafco Polyflex III or approved equal. Filler shall be within 1/8 inch below and flush with existing pavement surface and squeegeed, as necessary, to attain this result.

Cracks, joints, and holes to be filled shall be cleaned after cold milling.

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 Director.

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 Director. 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 test method ASTM 1557, the standard list in Section 3305 of the Uniform Building Code, and the Standard Specifications for Public Works Construction (SSPWC), unless otherwise recommended by the soil engineer in the preliminary soil report and approved by the Director.

For subgrades that cannot be compacted to 90% relative compaction and are not firm and unyielding, as directed by the engineer, full depth asphalt concrete shall be used, unless otherwise directed by the soil engineer. The full depth asphalt concrete section will require the removal of 0.5' of subgrade and backfilling with "blaid laid" and "wheel rolled" asphalt concrete base course to a stable condition by allowing overnight cooling.

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 County of Orange Resources and Development Management Department for construction of public roadways, or methods acceptable to the Director. Unless otherwise specified by the soil engineer, the relative compaction of each layer of compacted base material shall not be less than 90 percent.

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" AB
b.	Commercial Driveways, perimeter drives and loading areas	3" AC/ 10" AB
c.	Industrial driveways, perimeter drives and loading areas	3" AC/ 12" AB

12.6 DRIVEWAYS

Section 9.35.050 of the Dana Point Municipal Code describes the requirements for driveways. This section is included in Appendix 'E'.

NOTE: Driveway approaches and some driveways are typically located within the public right-of-way. All work within the public right-of-way requires a separate encroachment permit.

Additionally, Section 14.01.530 of the Dana Point Municipal Code, "Construction of Decorative Pavement Within Public Right-of-Way" applies to driveways and driveway approaches within the public right-of-way. An encroachment permit must be secured prior to commencement of any such work and requires approval from the Director. Standard submittal requirements for encroachment permits are available at the Public Works and Engineering Department. Additional submittal requirements for decorative pavement per the Dana Point Municipal Code include:

(1) A colored rendering of the proposed installation in plan and perspective views accurately reflecting the proposed colors and patterns desired;

(2) Full construction details showing how the proposed decorative paving will be constructed and, if the surface will be uneven, details of the contour of the finished surface of the decorative pavement; and

(3) A financial analysis of the life cycle maintenance costs of the proposed decorative pavement.

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 gravel bags. Slope planting or other measures to control erosion from all slopes above and adjacent to roads open to the public. Gravel bags 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 laces. 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 DIRECTOR

Prior to any grading, brushing, or clearing, there shall be a pre-grading 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 Director 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 Director 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 Director.
    5. Fill: After the fill has started, before the vertical height of the fill exceeds 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 Director.

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 Director.
    2. Terrace drains, down drains, brow ditches, and all other paved drainage devices:

(a) Subgrade: Prior to placement of welded wire mesh or reinforced 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 Director.

3. 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 Director 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 Director.
   (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 have 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 Director, 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 Director.

14.2 SPECIAL INSPECTIONS

The responsibilities and duties of a special inspector as provided in Section 1701, Special Inspections, of the Uniform Building Code as amended are included in Appendix F. Generally, special inspections are required when a City inspector is not present for the following items:

- Placement of and the taking of test specimens for concrete
- Ductile moment-resisting concrete frame
- Reinforcing steel and prestressing steel

- Welding
- High strength bolting
- Structural masonry
- Reinforced gypsum concrete
- Insulating concrete fill
- Spayed-on fireproofing
- Piling, drilled piers and caissons
- Special grading excavation, and filling
- Other special cases as defined in Appendix 'F' of this manual.

Refer to Appendix 'F' of this manual for specific details related to the scenarios listed above.

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 and excavation Code or this Grading Manual provided any such alternate has been approved pursuant to this section.
b. The Director may approve any such alternate provided he finds that the proposed design is satisfactory and complies with the provisions of the Grading and Excavation Code and this Grading Manual.
c. The Director 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 Director 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 Director 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 Director 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 the standards listed in Section 3305 of the Uniform Building Code 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 Director 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 Director, 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.
f. Completion of the City's Standard Civil Engineer's Certification Form and Standard Geotechnical Engineer's Certification Form. Both of these documents are included in Appendix I, "Standard Certification Forms".

APPENDIX A

TECHNICAL GUIDELINES FOR SOIL AND GEOLOGY REPORTS

CITY OF DANA POINT
PUBLIC WORKS & ENGINEERING SERVICES DEPARTMENT
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. Public Works & Engineering Services Department (PWESD) 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 PWESD.

The purpose of these technical guidelines is to inform grading permit applicants and their professional consultants of the basic information looked for by the PWESD 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 Dana Point Grading and Excavation Code, the Uniform Building Code, the California State Board of Registration policy statement (effective 1/1179) on adequacy of professional geological work as represented by the guidelines for standards of practice issued by the California Division of Mines & Geology, the Dana Point Planning Commission, and Subdivision Committee conditions of approval, the Dana Point Subdivision Code, the Standard Specifications for Public Works Construction (SSPWC), 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).

Part IV: Commercial and Industrial Sites - identities 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 I 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 PWESD.

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.
    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 ii 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, daylite 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.
        (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 Test Method ASTM 1557, Appendix Chapter 33 of the Uniform Building Code, or an approved equivalent.
    5. Shrinkage and/or bulking factors.
D. Foundation Design Criteria

1. Footing depth and width.
2. Criteria for foundation material preparation.
3. Allowable bearing values based on testing.
4. Lateral pressures (active, passive, or at rest conditions) and coefficient of friction.
5. Settlement - total, differential, and rate of settlement.

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 Director.

F. Conclusions and Recommendations
   1. Ground preparation (clearing, unsuitable material removal, scarification and moisturization).
      Footnotes:
      * U.B.C. requirements may be used as an alternative: soil classification of founding materials by Standard Method D2487 of the ASTM and use minimums and maximums based on U.B.C. Table 18-1-A or approved equivalent.
   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 (Appendix Chapter 33 of the Uniform Building Code, ASTM D1557, or approved equivalent).
      (c) Testing (minimum 90% relative compaction by standards listed in Appendix Chapter 33 of the UBC Section UBC 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.
   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).

G. 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.
    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 10 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.

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.

H. 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 far the method or placement and compaction of soil within the zone of the slope face.
    4. Slope stability - susceptibility to mass-wasting (creep to rapid failure potential).
        (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.
(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. 18-2 or approved equivalent and classify potential by U.B.C. Table No. 18-1-B).
3. Material densities and/or penetration tests (Standard Penetration or other methods of known correlation to material density).
4. Soluble sulfate content of soils in contact with concrete (test by ASTM 0516 or equivalent).
5. Gradation/size analyses, if appropriate
6. Atterberg limit analysis and parameters, if appropriate.
7. Geophysical survey, if appropriate - graphic and results.
6. 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 H) 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 sleeper 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 (Section 1626 through 1636).
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. Pre-stressed (post-tensioned) floatation slab specifications and recommendations, if this system is proposed.
    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 1904.3 Sulfate Exposure.
   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. Section 1805 “Allowable Foundation and Lateral Pressures”
   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 far pads or stabilization blankets for slopes.
    (b) Stabilization measures: 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.

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 land applicable items of Parts II and lll 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-for equivalent), results, sample location(s); or provide minimum AC sections per Grading Section 12.5 Pavement Structural Section of the manual 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 Fart lll for description of necessary content.

PART V: TECHNICAL GUIDELINES FOR PRELIMINARY SOIL AND GEOLOGY REPORTS ON RESIDENTIAL OR COMMERCIAL 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 lll.

A. Seismic evaluation of site (see Part lll For description of necessary content).
B. Evaluation of expansively 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 or test results.
      (a) Test identification number.
      (b) Date lest performed.
      (c) Maximum dry density.
      (d) Optimum moisture.
      (e) Field dry density.
      (f) Field moisture.

(g) Relative compaction.
(h) Approximate elevation of test. Approximate finish grade elevation at test site.

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 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.
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 geologists recommendations.