DCLU

Director's Rule 3-93

Applicant	Page of	Supersedes
CITY OF SEATTLE DEPARTMENT OF CONSTRUCTION AND LAND USE	1 5	2-87
	Publication 2-1-93	**Effective** 3-1-93
	Code and Section Reference SMC 22.804	
Subject General Duties and Responsibilities of Geotechnical Engineers	**Type of Rule** Code Interpretation	
	Ordinance Authority 3.06.040 SMC	
Index Building/Grading - Technical	**DCLU Approved** [signature] **Date** 2/24/93	

PURPOSE

The purpose of this rule is to define the Department's requirements for geotechnical engineers who are hired by permit applicants to analyze subsurface soils conditions on a site.

RULE

GENERAL REQUIREMENTS

Whenever development is proposed in a geologic hazard area as defined in the Regulations for Environmentally Critical Areas (Seattle Municipal Code Chapter 25.09) or when the Director determines that additional soils analysis is appropriate on a particular site, the applicant is required to submit a geotechnical report that evaluates the surficial and subsurface soils conditions on the site. The Geotechnical Consultant hired to perform this work must comply with the duties and responsibilities included in this rule.

The Geotechnical Report shall be prepared by the Geotechnical Engineer in consultation with the Director. The Geotechnical Engineer shall prepare the Geotechnical Report, including the Site Evaluation Checklist in accordance with generally accepted geotechnical practices. The Report must be signed and stamped by the Geotechnical Engineer who is licensed in the state of Washington.

The Geotechnical Engineer shall attend a Pre-construction Conference when requested by the Director. The Engineer is also responsible for developing

a program for monitoring the site during construction to ensure compliance with the recommendations in the Geotechnical Report and conditions of the permit, and for performing such monitoring.

CONTENTS OF GEOTECHNICAL REPORT

The Geotechnical Report shall discuss all the items on the attached Site Evaluation Checklist and shall make specific recommendations concerning stability of the site. If any item in the checklist is inapplicable to a particular project or to a stage of a staged-review project, the Report shall provide sufficient information to demonstrate why the item is inapplicable.

The opinions and recommendations contained in the Report shall be supported by field observations and literature review which may include appropriate explorations, such as borings or test pits, and an analysis of soil characteristics conducted by or under the supervision of the engineer in accordance with the American Society of Testing and Materials or other applicable standards.

Evaluation involving significant geologic evaluations or interpretations shall be reviewed and approved by a Geologist. It shall be the responsibility of the Geotechnical Engineer to assure that the Geologist has earned a degree in geology from an accredited college or university and has at least five years experience as a practicing geologist or four years of experience and at least two years of post-graduate study, research or teaching. The Geologist's practical experience shall include at least three years of work in applied geology and evaluation, in close association with qualified practicing geologists or geotechnical/civil engineers.

POTENTIALLY HAZARDOUS SOILS

In cases where the Director determines, or the Geotechnical Engineer recognizes, that a site has been used for manufacturing or industrial purposes, the Geotechnical Report shall contain information regarding past treatment, disposal or storage of hazardous materials on the site. Analytical test results of site soils to determine concentration of pollutants shall be presented when required by the Director or when the Geotechnical Engineer encounters or suspects the presence of ground contamination by hazardous materials. The Geotechnical Engineer shall provide information concerning the level of contamination, direction of contaminant migration, and the approximate extent of the plume. If contamination by hazardous materials is detected, the report shall indicate that the appropriate regulatory agencies have been contacted and provide appropriate discussion concerning reporting obligations of the property owner(s).

ADDITIONAL REQUIREMENTS FOR SITES IN GEOLOGIC HAZARD AREAS

When a report is required for a site located within a geologic hazard area, it shall comply with the following additional submittal requirements.

1. An evaluation of the erosion potential on the site during and after construction shall be submitted. It shall include recommendations for mitigation, including retention of vegetative buffers and a revegetation program. The Geotechnical Engineer shall provide a statement identifying buffer areas at the top or toe of a slope based on

geotechnical site constraints and the impacts of proposed construction methods on the stability of the slope.

The Geotechnical Engineer shall submit a statement that in the engineer's judgment, the plans and specifications conform to the recommendations in the Geotechnical Report and that all portions of the site which are disturbed or impacted by the proposed development will be stable or stabilized during construction and will continue to be stable after construction.

2. The Geotechnical Engineer shall submit a statement in the soils report that the design criteria consider the one in 100 year seismic event (an earthquake ground motion that has a 40% probability of exceedance in 50 years). Calculations of soil bearing capacity, general soil stability, and equivalent fluid pressure shall be adjusted to reflect a one in 100 year seismic event and the structural plans for the project shall be reviewed by the Geotechnical Engineer for consistency with these design criteria.

   Analysis for the one in 100 year seismic event shall be based on a near crustal event having an assumed magnitude of 6.5 and occurring directly below the site. Based on regional studies performed by others, the Director will allow use of the following minimum general values of horizontal peak ground accelerations for this event:

a = 0.15g for rock	a = 0.17g for till, firm glaciated soils	a = 0.20g for fill, alluvial soils

   The appropriateness of the above accelerations shall be confirmed by the Geotechnical Engineer based on the actual site characteristics. Reduction in the above values may be considered when supported by appropriate analytical evidence. Slope stability, lateral pressures and liquefaction of the site shall be assessed using the seismic parameters discussed above.

3. When development is proposed in a landslide-prone area, the Geotechnical Engineer shall make a recommendation as to which portion of the site is the most naturally stable and the preferred location of the structure. The limits of the area of grading activity shall be identified in the recommendations.

4. In general, no excavation will be permitted in landslide-prone areas during the typically wet winter months. When excavation is proposed, including the maintenance of open temporary slopes, between November 1 and March 31, technical analysis shall be provided to assure that no environmental harm or safety issues would result. The technical analysis shall be submitted for approval by the Director and shall consist of plans showing mitigation techniques and a letter from the Geotechnical Engineer of Record.

Further recommendations signed and sealed by the Geotechnical Engineer shall be provided should there be additions or exceptions to the original recommendations based on the plans, site conditions, or other supporting data. If the Geotechnical Engineer who reviews the plans and specifications is not the same engineer who prepared the Geotechnical Report, the new engineer shall, in a letter to the Director, express his or her agreement or disagreement with the recommendations in the Geotechnical Report and state whether the plans and specifications conform to his or her recommendations.

Reports prepared for Master Use Permit applications and projects in landslide-prone areas shall address comments received from the public and governmental agencies concerning the geotechnical aspects of the proposed development.

The Director may require supplements or amendments to the report when needed to develop a reasonably comprehensive understanding of the soil conditions on the site.

STAGED REVIEW REPORTS FOR PROJECTS IN LANDSLIDE-PRONE AREAS

Section 25.09.080.B. of the Seattle Municipal Code states that "projects proposed in landslide-prone areas shall be subject to a staged review process." Applicants for project sites which are designated landslide-prone areas may choose to submit the site geotechnical analysis in stages. Alternatively, reports may be submitted in a single complete step to allow for expedited soils review.

The report submittals must contain at least the following information:

a. All Stages:
   (1) Project number and address;
   (2) Declaration of which stage the report represents; and
   (3) Compilation of all previous reports into the current stage.

b. Stage A: Site Visit and Reconnaissance Report
   (1) Description of surface conditions, including surface soil reconnaissance and preliminary geologic hazard assessment;
   (2) Review of available literature;
   (3) Estimated (or surveyed) ground surface profiles; and
   (4) Conceptual siting of structures and general recommendations.

c. Stage B: Preliminary Soils Investigation
   (1) All of Stage A items;
   (2) Subsurface data, exploration logs and testing data;
   (3) Detailed analysis of topographic features;
   (4) Stability analysis of existing site;
   (5) Analysis of relationship of vegetation and slope stability; and
   (6) Conceptual site development sections.

d. Stage C: Geotechnical Investigations
   (1) All of Stage B items;
   (2) Geotechnical considerations to reduce risks;
   (3) Geotechnical criteria to be met for design;
   (4) Analysis of proposed final site stability;
   (5) Recommendations for construction procedures and construction monitoring;
   (6) Site check list; and
   (7) Evaluation of erosion potential and mitigation measures.

The full detail of each stage item will depend on the characteristics of the individual site. Each Stage C report will be required to meet all additional requirements of this rule and the Environmentally Critical Areas Regulations.

EXPLORATIONS

The Geotechnical Engineer shall conduct or direct all subsurface explorations. Explorations conducted in Environmentally Critical Areas shall meet the requirements of Director's Rule 20-90 or subsequent rules.

PRE-CONSTRUCTION CONFERENCE

The Geotechnical Engineer shall attend a Pre-construction Conference with the applicant, the Lead Design Professional, the Contractor, and Department Representatives when requested by the Director. The conference may include discussions of: excavation plans, phasing of work, monitoring requirements, geotechnical recommendations, instability risks, weather considerations, disposal of excavation soils, surface and groundwater conditions, fill materials, erosion control, and any other matters the Director deems relevant.

CONSTRUCTION MONITORING

The Geotechnical Engineer shall monitor the site and provide special inspection as required by the Director during the construction phase to ensure compliance with the recommendations of the Geotechnical Report, particularly site excavation, construction scheduling, shoring, soil support for foundations including piles, subdrainage installations, soil compaction, erosion control and any other geotechnical aspects of the construction. The construction monitoring shall meet the general requirements for special inspections as found in Director's Rule 23-87 or subsequent rules.

Unless otherwise approved by the Director, the specific recommendations contained in the Geotechnical Report shall be implemented by the owner. The Geotechnical Engineer shall provide written reports on the progress of the construction to the Director at such timely intervals as shall be specified by the Director. Omissions or deviations from the approved plans and specifications shall be immediately reported to the Quality Control Section of DCLU. The final construction monitoring report shall contain a statement from the Geotechnical Engineer that, based upon his or her professional opinion, site observations and testing during the monitoring of the construction, the completed development substantially complies with the recommendations in the Geotechnical Report and with DCLU-approved plans and all permit requirements. The final report shall be stamped by the Geotechnical Engineer. Occupancy of the project will not be approved until the report has been reviewed and accepted by the Director.

If a different Geotechnical Engineer is retained by the owner, the new engineer shall submit a letter to the Director stating whether or not he/she agrees with the opinions and recommendations of the original Geotechnical Engineer. Further recommendations, signed and sealed by the Geotechnical Engineer, as well as additional exploration, analysis and testing, shall be provided should there be exceptions to the original recommendations.

SITE EVALUATION CHECKLIST

The following are general report guidelines. These guidelines are not intended to be all inclusive. It is the responsibility of the Geotechnical Consultant to address all factors which in their opinion are relevant to the site. The checklist shall be completed and included as part of the Geotechnical Report. All items listed below must be addressed in the report. Information shall be provided for those items which are not relevant to a given site to demonstrate why the items are not applicable.

I. PROJECT INFORMATION

- A. Site Address
- B. DCLU Project Number
- C. Stage Designation for reports submitted for sites located in Environmentally Critical Areas (ECA)

II. PROJECT DESCRIPTION

- A. Description of proposed structural and site improvements
- B. Floor and foundation grades
- C. Anticipated excavation depths. If the excavation will extend below a 45 degree projection from the edge of the right-of-way, the report should indicate that a permit will be required from the Seattle Engineering Department.

III. SITE FEATURES

A. Vicinity map

B. Site plan showing existing and proposed structures and site improvements, property lines, and existing contour lines if available

C. Surface conditions, including adjacent properties, structures, and right-of-ways

D. Desciption of existing sewer and drainage facilities on or adjacent to site

IV. SITE RECONNAISSANCE (Stage A Reports)

A. Surface soil reconnaissance

B. Preliminary geologic hazard assessment

C. Review of available literature, geologic maps

D. Landslide history, including review of city files

V. SUBSURFACE CONDITIONS (Stage B Reports)

A. Subsurface conditions and site topographic features

B. Exploration logs

C. Test results

D. Geologic profile and site development sections

E. Groundwater Evaluation

VI. RECOMMENDATIONS AND CONCLUSIONS

A. Conceptual siting of structures and general recommendations (Stage A Report)

B. Stability Assessment, including existing condition, construction phase, and post-construction phase (Stage B Report)

C. Grading and earthwork, including site preparation, compaction requirements, fill specifications, and sequencing of earthwork operations (Stage C Report)

D. Foundation types, allowable bearing pressures, lateral earth pressures, temporary excavation slopes, drainage criteria, shoring, etc. (Stage C Report)

E. For projects in geologic hazard critical areas, assessment of 100-year seismic event, including its affect on bearing, lateral earth pressures, and slope stability (Stage C Report)

F. Evaluation of erosion potential and appropriate mitigation measures (Stage C Report)

VII. RISK EVALUATION STATEMENTS

A. In landslide-prone critical areas, the following will be required with all permit applications:

A statement that the plans and specification submitted to DCLU have been reviewed and conform to the recommendations of the analysis and report and, provided that those conditions and recommendations are satisfied during the construction and use, the areas disturbed by construction will be stabilized and remain stable and will not increase

the potential for soil movement; and the risk of damage to the proposed development and from the development to adjacent properties from soil instability will be minimal.

B. In Liquefaction-prone critical areas, the statements required for landslide-prone areas will be required when the Director determines the risks are still sufficiently high after consideration of any proposed mitigation.

C. In non-critical areas designated by the Director as having high risk potential, the following shall be submitted:

A statement that the plans and specifications submitted to DCLU have been reviewed and conform to the recommendations of the analysis and report, and provided that the conditions and recommendations are satisfied, the construction and development will not increase the potential for soil movement; and the risk of damage to the proposed development and from the development to adjacent properties from soil instability will be minimal.