

EARTH SCIENCES . JAMES EATON

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81-184

September 8, 1981

Mr. Andy Green  
Leland Construction Co.  
9607 S.E. 61st Place  
Mercer Island, WA 98040

Dear Mr. Green:

You are in the process of buying a single family lot on Mercer Island and expect to commence construction within a week or so. The building department has determined that the address will be 7030 S.E. Maker Street. The lot qualifies as steep slope by City ordinance; if construction is to begin before next spring, the critical part of grading and foundation work must be complete within about one month.

You and I inspected the property last week and discussed the grading and foundation plans in general terms. No part of the plans were completed at that time. The lot measures 75 by 100 feet and slopes toward the west at an average angle of roughly 45 percent or 25°. Most of the house and all of the driveway and garage will occupy the eastern part of the lot where terrain is generally between 10 and 15°. The western edge of house will be over slope which now stands at 25-30°. The property now supports weeds, brush, and a few scattered trees. One large maple tree will be removed to make room for the house. There is no defined drainage course onto or off of the lot.

From our examination and from my experience with several other projects in the immediate neighborhood, it appears that your entire building excavation will be in dense fine sandy glacial loam. This type of soil has fairly good internal drainage characteristics and has a good record of stability on slopes. On any steep slope there is some risk associated with construction. I believe that the greatest and only significant risk is of failure in the upper two or three feet where the soils are looser and weaker than the slightly weathered or unweathered deep soils. Compliance with my recommendations below will insure that no part of the house will be dependant on the shallow questionable soils.

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In grading the lot, I recommend that no unretained fill be placed on the property and that there be no retained fill thicker than three feet. Incidental special purpose aggregates and wall backfills are, of course, exceptions. I recommend that all north-south running continuous footings be buried at least five feet below original grade and that any isolated footings which are near the west side of the structure also be buried to the five foot depth. I recommend that all footings be designed to bear at not more than 4000 psf on undisturbed native soil. Local codes relating to minimum footing dimensions will apply.

All retaining walls should be designed to resist lateral soil pressures equal to equivalent fluid pressures of 35 pcf. If any walls are structurally engineered, the following may also be assumed:

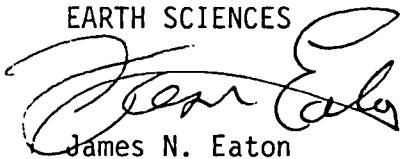
moist soil weight = 110 pcf. (backfill or native)  
coeff of friction against sliding = 0.4  
passive equivalent fluid pressure = 400 pcf

Backwall drains should be provided and only free draining gravel or sandy gravel should be used as backfill for at least half of the wall height beginning at the base. If possible, you should slope any temporary unretained cut at about 30° to the vertical. Along property lines, you should maintain a one foot undisturbed zone to allow for sloughing or raveling.

In case the excavation encounters unexpected conditions or problems of any type, please call me at once to inspect.

Yours very truly,

EARTH SCIENCES

  
James N. Eaton

JNE/jed

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3 copies submitted

