kpff Consulting Engineers

April 16, 2008

Mr. William Hawkins III
**William Hawkins III Architect**
1425 SW 20th Avenue
Portland, OR 97201

RE: Geotechnical Considerations
St. Andrews Condominiums
Portland, OR

Dear Bill:

We have reviewed the geotechnical investigation prepared by Professional Services Industries, Inc. (PSI) dated April 4, 2008 for the above referenced project in addition to the latest site grading plan and would like to discuss the following items related to the proposed excavations and shoring on the project: geotechnical peer review, shoring/underpinning methods at the base of the existing residence, survey and monitoring of the existing residence during construction, and shoring details at new building walls.

Based on the complexity of the site excavation, including the location of the adjacent property structure, we recommend that a geotechnical peer review be performed for the excavation/shoring portion of the project. This would entail a third party geotechnical engineer's review of PSI's report to confirm design intent and recommendations; (it would not require an additional report). Note this is only a suggestion to ensure additional quality assurance for the excavation and stability of the site. There are several qualified firms that we could recommend for this task, if desired.

The existing house, above the project, adjacent to the property line is assumed to have shallow foundations based on the estimated time of construction (circa 1900). The geotechnical report states that there is a 5 to 8 ft. stratum of silt overlaying fractured bedrock where the proposed vertical excavation occurs. The report further recommends tie-back wall construction for the shoring of this silt layer as excavation begins. We assume this would be a bidder-designed soil nail wall which falls outside our scope of services. Based on the proximity of the cut to the existing structure, we recommend that PSI review these recommendations with regards to potential settlement of the existing home. Most tie back (and soil nail) systems require some movement of the retained soil to engage the anchors. Movement of this soil could cause some settlement of the structure. Underpinning requirements may be warranted in order to mitigate this concern.

In addition, we recommend that the developer/owner perform an independent survey of the existing home prior to commencement of the excavation. Periodic survey monitoring should occur throughout the excavation to look for signs of movement. The survey should include an inspection prior to construction, noting any signs of existing settlement, damage and/or cracking, with all observations thoroughly documented. Monitoring should also be implemented to observe any settlement or movement that may occur during construction. We can provide assistance in recommending monitoring locations, if desired. The adjacent property home owner should review the results of the survey and be asked to comment on its accuracy. It should be expected that some cosmetic damage will likely occur to the adjacent home as a result of construction activities.

Review of the current site grading plan indicates that a significant portion of the east face of the new building structure will be directly adjacent to the vertical excavation. We recommend that at these locations, a rock anchor or soil nailed wall is constructed against the excavated surface to eliminate lateral earth pressures to the greatest extent possible. A drainage layer would then be constructed on the shoring wall with the addition of compressible material (approx. 4") to accommodate building movement under wind and seismic loading. The final building wall would then be placed against this drainage layer with a one-sided forming system (see attached sketch).

We realize that there are a lot of challenges associated with the proximity of the site, and feel that these issues can be appropriately mitigated through proper design. The purpose of this letter is to identify these significant items in order to assist with the design of a successful project.

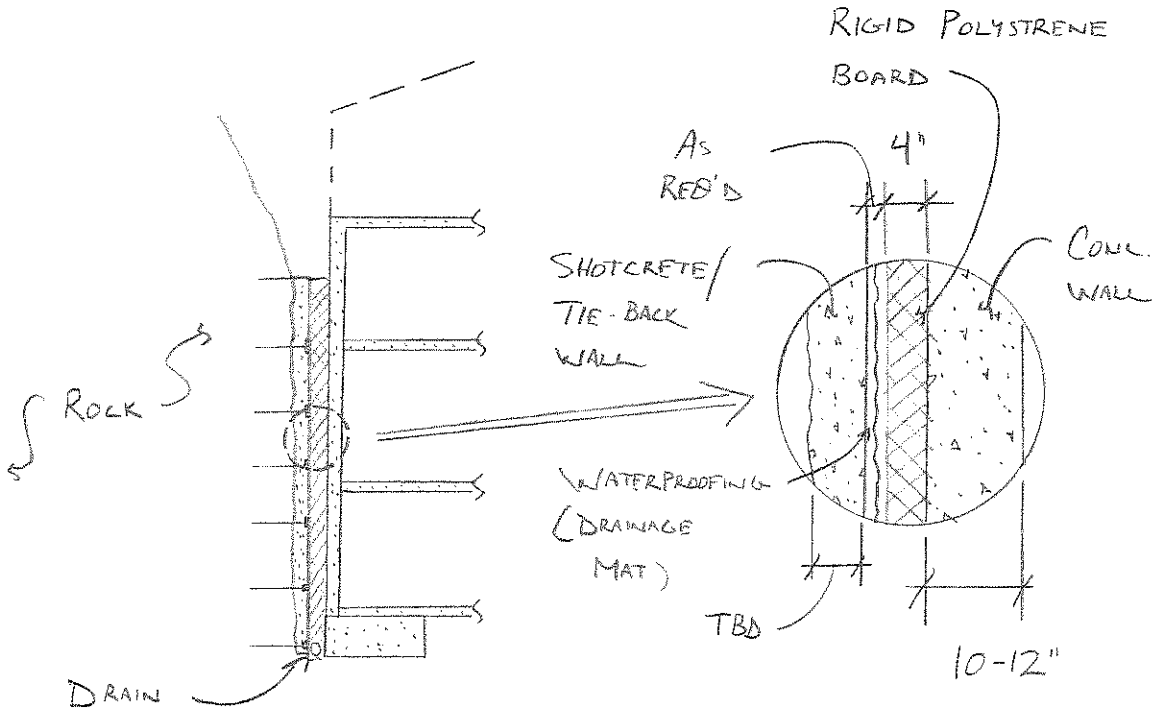
If you have any questions, or would like to discuss in more detail, please call me.

Sincerely,

Josh Richards, S.E.
Associate

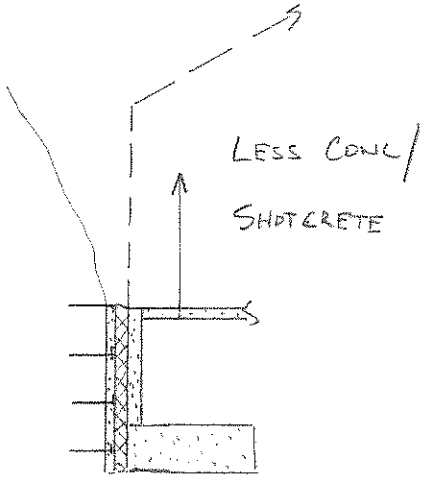
JR:kw
208003/geotechnical letter 04-16-08.doc

| kpff Consulting Engineers<br>Portland, Oregon | Project ST. ANDREWS | By JR | Sheet No. |
|---|---|---|---|
| | Location PORTLAND, OR | Date 4.16.08 | |
| | Client | Revised | Job No. |
| | | Date | |




SECTION AT ROCK EXCAVATION

NTS




NOTE:
FOR THIS CONDITION, RIGID POLYSTRENE BOARD IS NOT REQ'D IN GAP (ONLY WATERPROOFING, THUS SIGNIFICANTLY REDUCING WIDTH OF THIS SPACE)

IF BLDG CAN BE PULLED AWAY

NTS