



Project No. SC9395
19 August 2010

RICHARD MOE
c/o Craig Rowell
131 Linden Street
Santa Cruz, CA 95062

Subject: Response to City Of Santa Cruz's Environmental Consultants Phone and E-mail Comments Dated 8/11/10

Reference: Proposed Multiple Unit Housing Development
1930 Ocean Street Extension
APN 088-044-01 & 02
Santa Cruz, California

Dear Mr. Moe:

As requested, Haro, Kasunich and Associates is responding to City Of Santa Cruz's Environmental Consultants Phone and E-mail Comments Dated 8/11/10 for the referenced project.

Phone comments by Janice Lum (Associate Planner of the City of Santa Cruz). In summary, we understand you wish to know if building locations, retaining wall locations, proposed elevations, grading quantities and structural foundations will change as a result of performing our recommended additional field work and evaluation (e.g. liquefaction and slope stability analysis).

It is our professional opinion that building locations, retaining wall locations and proposed grades (improvements above ground) as shown on the preliminary grading plan by Bowman and Williams, dated 22 February 2010 will not significantly change as a result of our additional field work and evaluation. However, the type and depth of foundation elements and engineer fill proposed below grades (improvement below the ground surface) and erosion control provisions may change depending on the results of our additional field work and evaluation.

E-mail comments by the City's environmental consultant, forwarded to us by Janice Lum state the following:

1. Geotechnical Report.

- Liquefaction. The geotechnical report identifies potential liquefaction in southern portion of site, but soil borings could not be obtained in this area due to saturated soils, and the report recommended additional borings for three of the buildings and a formal liquefaction assessment recommended. A pier and grade foundation could be utilized which penetrates through the liquefiable layers (at least 15 feet according to the report) or use a 'floating' foundation design that would be subject to differential settlement. It seems this should be completed for the Initial Study so as not to defer analysis or mitigation.

In response, Boring 5 was performed within the northern portion of this Zone C. We can project the magnitude of liquefaction in this area. The soils in Boring 5 were loose and saturated to 15 feet below grade, but were also found to be cohesive in nature, indicating to us that that magnitude of liquefaction will be low to moderate and therefore engineering improvements below proposed grade can be easily modified during the design process to mitigate against the affects of liquefaction without drastically changing the current layout of the development.

- Retaining Wall. The geotechnical report also recommends additional borings for a "buttress" retaining wall as the proposed design may not be feasible depending on underlying bedrock. Again since designs could be altered, this should be addressed now.

In response, we were referring to specific foundation elements (helix anchors/tieback) below grade in our 25 February 2010 Geotechnical Feasibility Plan Review letter in relation to the subsurface information obtained to date from a feasibility perspective. It is our professional opinion that there are several foundation options to support the buttress retaining wall (soldier piles, embedded gravity walls, etc) and that the type of foundation that is chosen and designed will not drastically change the current layout of the development (improvements above ground) as shown on the preliminary grading plan by Bowman and Williams, dated 22 February 2010.

- Slope Stability. To determine project consistency with City policies and regulations regarding setbacks from 30+% slopes, the geotechnical report should review the proposed setbacks from 30% slopes and whether there are any slope stability issues. In going over the geotech report, there is no discussion related to slopes other than to indicate a slope stability analysis is warranted on slopes steeper than 25%. Building 10 appears to encroach into the 30% slope area with no setback, and Buildings 7-9 are within less than 20 feet from the toe of the 30% slope.

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In response, existing grades behind Buildings 7 through 10 are shown to be inclined at 1.5:1 (horizontal:vertical) or 66% slope. At the time of our feasibility work, there were some signs of erosion on this slope due to runoff from Graham Hill Road, but there were no signs of deeper and/or surficial slope instability. Since then our feasibility work, an asphalt dike has been constructed on the outboard edge of Graham Hill Road that diverts runoff away from the eroded areas of the 66% slopes and considerably reduces erosion and decrease the potential of slope instability. In addition, proposed cut slopes behind building 7, 9 and 10 are shown to be buttressed with a retaining wall with a back slope cut back to a more stable gradient of 2:1 (horizontal:vertical) or 50%. Based on our subsurface information, it is our professional opinion that buttressed 2:1 cut slopes into native soils will be stable as long as drainage and erosion control is properly implemented and maintained. Therefore the 6 foot setback from these slopes is adequate. Final slopes behind Building 8, are also shown to be buttressed with a retaining wall and maintained at 66% slope. This slope will be part of our future slope stability evaluation to verify the 6 foot setback is adequate. If not adequate, we anticipate mitigation measures will consist of placing an extended slough wall or a more heavy duty or permanent erosion control blanket over these slopes.

- Grading. Additionally, the proposed grading on the north and west should be reviewed for any potential impacts related to slope stability.

Based on the Bowman and Williams preliminary grading plan dated 22 February 2010, the existing erosion gulley bordering the north end of the development will be filled with a 2:1(horizontal:vertical) engineered fill slope, buttressing the vertical free face of the gulley. The earth materials below Building 4 and below the driveway B, will therefore be permanently contained by the stabilization of the adjacent gulley. The existing slope at the northwest corner of the property is about 12 feet high and inclined at 1.5:1 (horizontal:vertical). During our feasibility work, there were no signs of global and surficial instability, but no signs of erosion. The top of this slope is setback 30 feet from Building 3. Due to the setback, potential for slope instability affecting Building 3 is low. However, erosion and sloughing soil from this slope during intense rainfall could flow down onto the inboard side of Ocean Street Extension. Mitigation measures would consist of the placement of a more heavy duty erosion control blanket over this slope. The proposed 2:1 (horizontal:vertical) engineered fill slopes shown on the north and west sides of the development will be stable as long as the earth materials used as engineered fill conforms to our specifications outlined in our General Site Grading section of our Geotechnical Feasibility Report dated April 2007.

2. Offsite Grading and Improvements. In looking at the grading/drainage plan, there will be some regarding to the west (also 30% slope) that appears to be offsite. As I recall, this property is more of an oak woodland habitat, and there appears

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to be tree removal. The following project reviews will be needed to assess impacts in this area:

- Biological Resources
- Tree Removal
- Archaeology

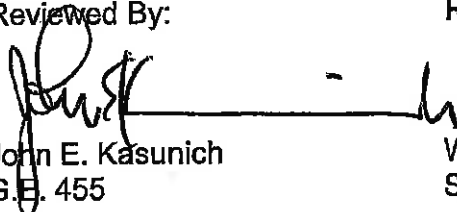
No Comment

If you have any questions, please call our office.

Sincerely,

Reviewed By:

HARO, KASUNICH AND ASSOCIATES, INC.


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WSC/dk

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