

Project No. SC9395
20 November 2014

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Subject: Geologic Assessment and Response to Geology and Soils Comments
from Wittwer and Parkin LLP

Reference: Proposed Multiple Housing Development
APN 008-044-01 & 02
1930 Ocean Street Extension
Santa Cruz, California

Dear Mr. Rowell and Mr. Moe:

At your request we have reviewed the "Geology and Soils" comments contained in the "Comments on Mitigated Negative Declaration" dated October 7, 2010 authored by Wittwer & Parkin LLP.

Wittwer and Parkin (W&P) assert that the Mitigated Negative Declaration for the project improperly defers geotechnical analysis which may reveal additional risks to life and property. They claim the Initial Study (IS) and Mitigated Negative Declaration (MND) improperly assume that these impacts can be mitigated without first having performed the required studies. One of the "mitigation measures" is to require the Applicant to perform additional geotechnical studies. Wittwer and Parkin assert that the additional geotechnical studies are not mitigation measures, but instead are in fact required to identify possible mitigation measures for the geotechnical constraints on development of the Property. W&P suggest the success of mitigation of geologic and geotechnical constraints is uncertain, and the City of Santa Cruz could not have reasonably determined that significant geological or geotechnical impacts would not occur as a result of the proposed project. W & P indicate the IS and MND fail to adequately identify, address and mitigate slope stability and landslide impacts associated with the Project. Lastly, W & P indicates the IS and MND fail to disclose the history of landslides in this area. Our clients are aware of at least two instances, one in 1999 and another in 2001, in which landslides have occurred on similar slopes.

Haro, Kasunich and Associates Inc. (HKA) are the project geotechnical engineers for the referenced development. HKA prepared a Geotechnical Feasibility Investigation and a lengthy report dated 5 April 2007. That investigation included:

- 1) Several site visits
- 2) Review of published geologic maps and literature
- 3) 8 exploratory borings across the property
- 4) Field and laboratory testing
- 5) Geotechnical analysis and interpretation
- 6) Preparation of a report and graphics presenting geotechnical engineering conclusions and recommendations. That report was signed by John E. Kasunich who is licensed by the State of California as a Civil Engineer and Geotechnical Engineer.

The 5 April 2007 HKA report indicates that: "The results of our investigation indicate there are no adverse geotechnical hazards." Geotechnical Hazards are commonly defined as: (1) seismic events, including but not limited to earthquakes, earthquake-induced landslides, liquefaction, subsidence, and tidal flooding damage from earthquake-induced tsunamis and seiches; (2) non-seismic unstable conditions, including but not limited to landsliding, cliff retrenchment, erosion, subsidence, soil creep and shrink/swell conditions; and (3) debris flows and debris avalanches.

Since publication of the 2007 HKA geotechnical report, Bowman and Williams, Consulting Civil Engineers, from Santa Cruz, have prepared a detailed Topographic Map (March 9, 2009) and a Grading Plan with Site Sections (February 22, 2010) defining the proposed development (including building and street locations). The project developer selected to use cut and fill grading operations to construct level pads benched up from Ocean Street Extension to the steeper slopes below Graham Hill Road rather than constructing buildings on existing slope gradients using pier and grade beam foundation systems. The selected design utilizes retaining walls to contain proposed cut slopes that are 5 to 15 feet high. This design significantly increases the overall stability of the site and therefore reduces any potential instability that may occur in the near surface soils. Based on the proposed layout and a review of the cross sections depicting the retained excavations and level building sites it is our opinion that slope instability is not a concern relative to development in what HKA labeled Zone A, B and C in the 2007 report. The proposed project improvements will not be constructed on Zone D, the steeper slopes that include fill wedges dropping down from Graham Hill Road.

The 2007 HKA report recommended supplemental soil borings to develop site specific design criteria for retaining walls and building foundation systems. These are the "additional geotechnical studies" being referred to by W&P. These design level studies will utilize the proposed cut and fill grading elevations to specifically evaluate soils at foundation zone elevations which will be 5 to 15 feet below existing grade. The studies will provide specific mathematical design parameters including but not limited to active earth pressures and seismic surcharge loads. The purpose of the additional design level geotechnical studies is not to determine the geotechnical feasibility of the project and whether mitigation of geologic and geotechnical constraints can be successful; that has already been determined in the 2007 Geotechnical Feasibility Investigation. The design level geotechnical study is to allow the project structural engineers to calculate and dimension the details of the proposed retaining walls and foundations. For example this will include the details necessary for building permit plan check, such as foundation dimensions and depths, reinforcing steel details, necessary concrete strength, and seismic design details. It is customary throughout California, that this work is not completed until discretionary permit approval has been granted and design has progressed to the point where specific recommendations can be made for all of the geotechnical aspects of the work.

Since W&P are concerned that slope stability and landslide impacts associated with the project have not been adequately identified, addressed and mitigated, we have performed additional geologic research and analysis. Mark Foxx (Certified Engineering Geologist 1493) has done the following:

- 1) Reviewed the "Geology and Soils" comments contained in the "Comments on Mitigated Negative Declaration" dated October 7, 2010 authored by Wittwer & Parkin LLP.
- 2) Reviewed the 2007 HKA report including the site map, geologic map and liquefaction potential maps presented as figures 1 through 3, and the boring logs resented as figures 4 through 10 in the report.
- 3) Reviewed the detailed Topographic Map (March 9, 2009) and a Grading Plan with Site Sections (February 22, 2010) defining the proposed development (including building and street locations) prepared by Bowman and Williams, Consulting Civil Engineers, from Santa Cruz,
- 4) Made a site visit and walked and observed the entire site. In addition, Mark Foxx has periodically observed the property from Graham Hill Road and occasionally from ocean Street Extension during the last 30 years.

- 5) Examined time-sequential aerial photography of the site.
- 6) Reviewed the "Preliminary Map of Landslide Deposits in Santa Cruz County, California, By Cooper-Clark and Associates, 1975".
- 7) Observed drainage conditions along Graham Hill Road, the County owned road that borders the upper (eastern) boundary of the property proposed for development.
- 8) Prepared this letter report entitled "Geologic Assessment and Response to Geology and Soils Comments from Wittwer and Parkin LLP"

As a result of the above mentioned work, we conclude the following:

- 1) No landslide deposits were mapped on the property proposed for development by Cooper-Clark and Associates in their 1975 study. The nearest landslide deposit they mapped is approximately 2000 feet north of the subject property.
- 2) No evidence of landsliding on the property is visible on the historical aerial photography dating from 1993 to 2014.
- 3) No evidence of recent or historic landsliding was observed on the property during the on-site reconnaissance.
- 4) The gully located on the northern portion of the property formed from erosional processes, not as a result of landsliding. A storm runoff drainage pipe discharges into the gully.
- 5) Storm runoff from Graham Hill Road where it borders the property is well controlled by an asphalt curb located along the outer edge of the pavement.
- 6) The 2010 Grading plans prepared by Bowman and Williams, Consulting Civil Engineers, are geologically and geotechnically feasible to implement.
- 7) Geologic risks on the property can be mitigated to an acceptable level by appropriate design that conforms to latest edition of the California Building Code and incorporates appropriate civil, geotechnical, structural and drainage engineering design criteria that are incorporated in the final project plans and implemented during construction.

- 8) Final geotechnical design studies and reports that outline site specific design criteria for retaining walls and building foundation systems shall be prepared. The purpose of the additional design level geotechnical studies is not to determine the geotechnical feasibility of the project and whether mitigation of geologic and geotechnical constraints can be successful; that has already been determined in the 2007 Geotechnical Feasibility Investigation. The design level geotechnical study is to allow the project structural engineers to calculate and dimension the details of the proposed retaining walls and foundations. For example this will include the details necessary for building permit plan check, such as foundation dimensions and depths, reinforcing steel details, necessary concrete strength, and seismic design details.

Lastly, W & P indicates the IS and MND fail to disclose the history of landslides in this area. I (Mark Foxx; Certified Engineering Geologist 1493) has periodically traveled along Graham Hill Road for approximately 30 years, and recalls that during that time observing at least two episodes of erosion and instability along the outboard shoulder of Graham Hill Road and the slope below. This historical erosion and instability was caused by uncontrolled surface runoff that accumulated along Graham Hill Road during heavy rains and discharged in an uncontrolled manner off the edge of the County Road pavement. Neither of these episodes occurred on the property proposed for development. The location of those problems were related to areas where Graham Hill Road was poorly designed and lacked design features (such as the asphalt curb at the outer edge of the pavement that is present at the property proposed for development) to prevent problems associated with uncontrolled surface runoff. Graham Hill Road has been repaired and modified over time to direct all road surface drainage away from its outboard edge so that storm water does not spill onto the referenced property.

If you have any questions, please call our office.

Very truly yours,

HARO, KASUNICH AND ASSOCIATES, INC.



Mark Foxx
Certified Engineering Geologist 1493

MF/dk

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1 to File