

CITY OF AGOURA HILLS

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CITY CLERK

CITY OF AGOURA HILLS - GEOTECHNICAL REVIEW SHEET

To: Doug Hooper

Project Location: 30800 Agoura Road, Agoura Hills, California.

Building & Safety #: 08-CUP-001

Geotechnical Report: Gorian & Associates, Inc. (2014), "Geotechnical Site Evaluation Update Report and Response to City of Agoura Hills Review Sheet Dated November 11, 2011, Senior Housing Community, Vesting Tentative Tract Number 71742 (APN# 2061-001-025), 30800 Agoura Road, Agoura Hills, California," Log Number: 2272-1-0-101, dated January 30, 2014..

Gorian & Associates, Inc. (2007), "Geotechnical Update Study, Senior Housing Community, APN# 2061-001-025, 30800 Agoura Road, Agoura Hills, California," Log Number: 2272-1-0-100, dated September 7, 2007.

Gorian & Associates, Inc. (2003), "Geotechnical Update Study – The Park at Ladyface Mountain, Senior Housing Community, APN# 2061-001-025 and 30800 Block of Agoura Road, Agoura Hills, California," Work Order: 2272-1-0-13, dated February 21, 2003.

Gorian & Associates, Inc. (2000), "Results of Preliminary Geotechnical Investigation, Agoura Hills Project, APN# 2061-001-025 and 30800 Block of Agoura Road, Agoura Hills, California," Work Order: 2272-1-0-11, dated October 12, 2000.

Plans: Hardy Engineering (2014), "Vesting Tentative Tract Map Number 71742 & Preliminary Grading Plan, A Corporated Territory of The County of Los Angeles," Scales; 1"=20' and 1"=40', Date March 2014.

HMK Engineering, Inc. (2003), "Preliminary Grading Plan, Tentative Tract Map No. 71742, County of Los Angeles," Scale 1"=40', W.O. 01-537, Plot Date August 18, 2003.

Previous Reviews: November 11, 2011.

FINDINGS

Planning/Feasibility Issues

- Acceptable as Presented
- Response Required

Geotechnical Report

- Acceptable as Presented
- Response Required

REMARKS

Gorian and Associates, Inc. (GAI; consultant) provided a "Geotechnical Site Evaluation Update Report and Response" for the proposed development at the site located at 30800 Agoura Road in the City of Agoura Hills, California. The report also includes a response to a geotechnical review letter by the City of Agoura Hills dated November 11, 2011 prepared for the site. The development currently proposed is significantly changed relative to the last submittal (HMK 2003), and includes the construction of two residential buildings with subterranean parking, retaining walls with a maximum height of 27 ft, associated infrastructure improvements, and widening of Agoura Road. Other associated improvements include access and landscaping areas.

The City of Agoura Hills – Planning Department reviewed the referenced report from a geotechnical perspective for compliance with applicable codes, guidelines, and standards of practice. GeoDynamics, Inc. (GDI) performed the geotechnical review on behalf of the City. Based upon a review of the submitted reports, the

consultant shall adequately respond to the following Planning/Feasibility comments prior to consideration by the Planning Commission of approval of Case # 08-CUP-001. The Consultant should respond to the following Report Review comments prior to Building Plan-Check Approval. Plan-Check comments should be addressed in Building & Safety Plan Check. A separate geotechnical submittal is not required for plan-check comments.

Notes to City:

1. *The grading plan shows proposed retaining walls higher than 6 ft. The City code limits the height of retaining walls to 6 ft or less. Variances for retaining wall heights may be required for approval of the grading plan. No justification for deviation from the code requirements were provided in the referenced reports.*
2. *The consultant has responded to a previous comment by indicating that some improvements shown on the current development plan (widening of Agoura Road) will be completed as a separate project by the City of Agoura Hills.*

Planning/Feasibility Comments

1. The Geotechnical map shows that three seven-foot deep trenches were excavated within the general area of Building A, with only one trench located within the building area. The trenches extended only about two feet into the Older Alluvium underlying the unsuitable surficial materials. Information regarding the type, depth and engineering characteristics of underlying alluvial deposits in the building area is limited. Considering that Building A is a structure of significant size that includes subterranean parking levels and retaining walls that extend to heights of eight feet, the consultant should discuss the adequacy of available information in this area and the need to provide additional, subsurface exploration and testing.
2. Cross-section C-C' does not seem to fully correspond with the grading plan. Specifically, the consultant should provide the basis for assuming that the subterranean garage does not extend to the outer limits of the building. Please reconcile this apparent discrepancy and revise the section as necessary.
3. New fills are proposed to derive support from existing fill along Agoura Road. Sufficient exploration and testing appears warranted to verify the adequacy of this existing fill to support the proposed improvements. If the fill needs to be removed, the consultant should provide specific recommendations to support the existing road during the fill removal.

Note: The consultant responded to this comment by stating that the new fill necessary to widen Agoura Road would be placed as part of a separate project to be undertaken by the City of Agoura Hills. Further the consultant explained that development of Building A does not require any fill to be placed along Agoura Road, and that development of Building B would require only the fill slope north of the building that would toe along the north property line. Access drives to both buildings would require only minor grading along Agoura Road that would have no impacts on the existing fill. GDI has the following comments regarding this response:

- a) The toe of fill below Building B extends along the property line. Colluvium in this area is depicted as being only a few feet thick on Cross Section A-A'. The basis for interpreting such a thin section of colluvium in this area is not clear, and is contrary to normal colluvial configurations (colluvial wedges tend to thicken in the downslope direction). The inclination of the colluvial contact appears to be constrained at about 13 to 14 degrees between borings B-2 and B-6. Immediately north of B-6, the contact is depicted on Cross Section A-A' as flattening to about eight degrees. This change in inclination is unconstrained. A downslope continuation of the 13 to 14 degree dip constrained between B-2 and B-6 would result in a colluvial wedge closer to about 20 feet thick below the proposed toe of slope. The consultant should discuss how the recommended removals (all colluvium) will be accomplished if a thick section of colluvium is encountered below the toe of the proposed slope.
 - b) The consultant should discuss how the fill slope that descends from the property line between the two access drives will be constructed without widening Agoura Road. This fill appears to be necessary to construct the infiltration basin west of the Building B access, the stormdrain headwall east of the Building A access, and the bioswale that extends between these two structures.
4. The consultant should provide a more detailed discussion of stability issues where contorted Calabasas Formation will be exposed in cut-slopes and retaining walls. Cut-slopes and retaining walls depicted on the current plan appear likely to expose Calabasas Formation with bedding planes at least locally inclined

northerly at low angles. The consultant should provide analyses to verify that the recommended equipment width stability fill will be adequate to mitigate the potential for translational failures along unsupported sections of bedding in the Calabasas Formation. Continuity of bedding should be assumed in critical areas unless sufficient field exploration is provided to demonstrate a lack of continuity. Mitigation measures should be recommended as necessary.

Note: The consultant responded to this comment by stating that the deeper cut would be supported with a soil nail wall, and that the wall had been analyzed. Rotational analyses appear to be based on shear strengths averaged to represent the overall mass of the Calabasas Formation. The consultant's approach of averaging shear strengths in the Calabasas Formation may be appropriate in considering a rotational failure in the bedrock; however, the consultant should also consider the potential for translational failures where short sections of adversely oriented, low-strength bedding may combine with tension cracks to form unsupported blocks of rock above adversely oriented surfaces. This analysis should be based on some reasonable estimate of the anticipated lateral continuity of adversely oriented structures that can be incorporated into generalized models for evaluation of the forces on the proposed soil nail wall.

5. The contact between the Older Alluvium and the underlying Calabasas Formation is reported to be inclined northerly at an overall gradient of about 13 degrees, with variable material conditions. At some locations the contact was found to be abrupt. Other locations encountered residual soil of gray clay (B-1), or plastic clay seams within the uppermost part of the Calabasas Formation inclined roughly parallel to the contact (B-3). The consultant should discuss and evaluate as necessary the potential for translational deformation where this contact will be exposed in future cut-slopes or retaining wall back-cuts. Mitigation measures should be recommended as necessary.

Note: The consultant responded to this comment by referring to rotational stability analyses provided in the report. However, the rotational stability analyses provided do not address the potential for translational movement where the contact between the Older Alluvium and the underlying Calabasas Formation is inclined toward the back of the proposed wall at an angle of about 13 degrees. As noted in the earlier comment there are numerous indications that low strength materials are associated at least locally with this contact. These include "clay soil", "plastic deformation" and "plastic, possibly polished clay seams" noted near the contact in Borings B-1, B-2 and B-3, and indications of low-angle dips within the Calabasas Formation in Borings 4 and 6 (Boring 5 did not extend to the contact). The consultant describes a failure associated with the Qoal/Tc contact just northeast of the project. Inasmuch as construction of a soil nail wall tends to provide limited opportunity for evaluation during construction, it would appear prudent to provide sufficient subsurface exploration and analyses to better define the nature of this contact and the underlying bedrock prior to construction.

6. The consultant should evaluate the potential for topsoil/colluvium to exert creep pressure on the retaining walls (example: retaining wall in Cross-Section A-A'). Mitigation measures should be recommended as necessary.
7. The proposed development includes the construction of an approximately 27ft-high, soil nail retaining wall. The slope stability analyses of the soil nail wall indicate that nail lengths of 25 to 35 ft are required. However, it is not clear if this length includes the resistance length. The consultant should provide a section through the soil nail retaining wall. The section should depict soil/geologic units behind the retaining wall, the wedge to be supported by the retaining wall (example: Rankin Zone), backdrain system, the soil nail resistance zone, and other soil nail geotechnical design considerations.
8. Areas behind soil nail walls should be designated a Restricted Use Areas (RUA) as per the County of Los Angeles Geotechnical Guidelines.
9. The consultant provides earthquake parameters (peak ground acceleration and earthquake magnitude) based on a seismic event that has a 10% probability of exceedance in 50 years. The consultant should revise these parameters to comply with the 2013 edition of the California Building Code (and by adoption, the City of Agoura Hills Building Code). Mitigation measures should be recommended as necessary.
10. Considering the presence of silty fine- to coarse-grained sand within the older alluvium that underlies most of the site; the relatively shallow depth to groundwater, and the severe ground shaking (that is: relatively high peak ground acceleration) anticipated at the site, the consultant should discuss and evaluate as necessary the potential for liquefaction and related hazards to occur at the site. Mitigation measures should be recommended as necessary.

11. The consultant indicates on page 18 of the above-referenced report that "a Building Pad Over-Excavation Detail is attached in Appendix D." This detail, as well as other details (see page 20 of the above-referenced report) are missing. All missing details should be provided for review.
12. The grading plan depicts "Bioswales" and an "infiltration basin". The consultant should discuss and evaluate as necessary the impact of the proposed on-site water infiltration on the stability of the site. Mitigation measures should be recommended as necessary.
13. The consultant should perform a geotechnical evaluation, including subsurface exploration in the proposed on-site infiltration areas in accordance with the County of Los Angeles Guidelines and Manuals.

Report Review Comments

1. The consultant should review final development plans, including the grading plans when they become available. A copy of the grading plan should be used as a base map for an updated geotechnical map. Additional geotechnical recommendations should be provided as necessary to address the various aspects of the development/grading plans.
2. The consultant should evaluate the potential for interaction between retaining walls and adjacent foundations/structures. Mitigation measures should be recommended as necessary.

Plan-Check Comments

1. The name, address, and phone number of the Consultant and a list of all the applicable geotechnical reports shall be included on the building/grading plans.
2. The following note must appear on the grading and foundation plans: *"All retaining wall excavations shall be reviewed by the project engineering geologist for the presence of adversely oriented joint surfaces. Adverse surfaces shall be evaluated and supported in accordance with recommendations of the project geotechnical engineer."*
3. The grading plan should include the limits and depths of overexcavation for the swimming pool, the road and flatwork areas as recommended by the Consultant.
4. The following note must appear on the grading and foundation plans: *"Excavations shall be made in compliance with CAL/OSHA Regulations."*
5. The following note must appear on the foundation plans: *"All foundation excavations must be observed and approved, in writing, by the Project Geotechnical Consultant prior to placement of reinforcing steel."*
6. Foundation plans and foundation details shall clearly depict the embedment material and minimum depth of embedment for the foundations.
7. Drainage plans depicting all surface and subsurface non-erosive drainage devices, flow lines, and catch basins shall be included on the building plans.
8. Final grading, drainage, and foundation plans shall be reviewed, signed, and wet stamped by the consultant.
9. Provide a note on the grading and foundation plans that states: *"An as-built report shall be submitted to the City for review. This report prepared by the Geotechnical Consultant must include the results of all compaction tests as well as a map depicting the limits of fill, locations of all density tests, outline and elevations of all removal bottoms, keyway locations and bottom elevations, locations of all subdrains and flow line elevations, and location and elevation of all retaining wall backdrains and outlets. Geologic conditions exposed during grading must be depicted on an as-built geologic map."*

If you have any questions regarding this review letter, please contact GDI at (805) 496-1222.

Respectfully Submitted,
GeoDynamics, INC.

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