

**Job #05-389-P**

May 8, 2006

Mr. Rick Ryerson  
P. O. Box 244  
San Marcos, California 92079

**GRADING AND FOUNDATION PLAN REVIEW, PROPOSED SYCAMORE POINTE  
BUSINESS PARK, 1315 HOT SPRING WAY, VISTA, CALIFORNIA (GP-049)**

Final Precise Grading Plans prepared by LDE Consulting (dated January 12, 2006), and Foundation Plans and Details prepared by R2H Engineering, Inc. (dated January 23, 2006) for the project development referenced above were provided to us by Kenneth D. Smith Architect & Associates via a letter of transmittal dated April 4, 2006, for geotechnical review and comments. Copies of the final Precise Grading Plans are reproduced and enclosed with this review report as Figures 1 and 2. The project property was the subject of previous geotechnical studies conducted by this office.

Reference is made to the following pertinent geotechnical documents and technical reports:

1. "Response to City of Vista Third Party Geotechnical Review, Sycamore Pointe Business Park Project, Hot Spring Way, Vista, California (GP 05-049)," Prepared by Vinje & Middleton Engineering, Inc., Job #05-389-P, dated January 4, 2006.
2. "Clarification Letter And Undercut Recommendations, Parcel A, Sycamore Avenue And Hot Spring way, Vista, California," Prepared by Vinje & Middleton Engineering, Inc., Job #05-389-P, dated November 17, 2005.
3. "Update Preliminary Geotechnical Report, Parcel A, Sycamore Avenue And Hot Springs Way, Vista, California." Prepared by Vinje & Middleton Engineering, Inc., Job #05-389-P, dated September 14, 2005.
4. "Preliminary Geotechnical Investigation, Parcels A, E and D, Sycamore Avenue, Near Melrose Drive, City of Vista, California," Prepared by Vinje & Middleton Engineering, Job #99-121-P, dated March 29, 1999.

The above-referenced reports are on file with this office and were reviewed in connection with this work. Copies can be obtained upon request. The purpose of this effort was to review the enclosed grading and foundation plans and insure their compatibility with the site geotechnical conditions as established in the referenced reports and documents. Revised and/or added recommendations that are consistent with final lines and grades depicted on the plans are included herein.

## **I. PROJECT DESCRIPTION AND BACKGROUND**

The project site is a graded hillside parcel surrounded by 2:1 gradient slopes. These are graded and planted embankments that descend to the north and west, and ascend to the south and east. The maximum slope height approaches 30 feet in the northwest corner. Much of the site is characterized by a level pad surface which has recently been cleared of vegetation. Site drainage generally sheetflows westward into a designed storm drain inlet structure. Excessive erosion is not in evidence.

The project site is a graded parcel which evolved to present grade levels during a series of grading episodes. Grading operations at the site likely began in the mid-1980's, chiefly as borrow operations for nearby projects. Excavations were assisted by blasting operations. Much of the generated debris was utilized as compacted fill or crushed for select backfill materials on nearby projects. A subsequent grading effort, conducted in late 1988, resulted in the placement of a wedge-shaped mass of compacted fill in the western portion of the property. Fill operations were tested and inspected by Ketchum Engineering, Inc., who issued a compaction report for the work dated March 10, 1989. The fill was subsequently evaluated in the Referenced 1 Preliminary report prepared by this office.

In early 1992, a storm drain pipe was added which flows northward into an existing facility along Sycamore Avenue. Testing and inspection of backfill soils placed over the pipe were provided by MV Engineering, Inc., who issued a compaction report for the work dated February 6, 1992.

## **II. GEOTECHNICAL CONDITIONS**

The project site is a graded cut-fill surface surrounded by 2:1 gradient slope embankments. Much of the site is directly underlain by crystalline bedrock units that are rooted in the southern California batholith. Local exposures are commonly light colored, coarse grained rocks which occur in a friable weathered condition near the surface and grade to very hard with depth.

Surface areas of the project site are mantled by soil deposits. Most notably, these include compacted fill sections along the west margin and some loose soil debris along the toe of ascending cut slopes. Compacted fill soils at the project consist chiefly of light to dark colored silty sands. Previous testing of the compacted fill at the site generally indicate loose conditions near surface levels grading compacted and dense

with depth. Details of site earth materials are given in the referenced geotechnical reports. Slope instability is not indicated at the project site.

### **III. PROPOSED DEVELOPMENT**

Planned development grades are depicted on the enclosed Figures 1 and 2. Planned grades relative to site surface levels are also shown on Geotechnical Cross-Sections enclosed herein as Figures 3 and 4. As shown, minor cut-fill regrading is planned to adjust existing levels as much as 3 feet in elevation. Perimeter retaining walls will be utilized to slightly enlarge level pad areas.

The property is planned to support two large commercial buildings with surrounding paved travelways and parking surfaces. One building in the northernmost portion will slightly project over a descending slope as shown. Proposed buildings will have exterior concrete tilt-up walls, with a light roof supported on perimeter grade beam foundations and interior spread pad footings, and slab-on-grade type floor constructions.

### **IV. CONCLUSIONS AND RECOMMENDATIONS**

Based upon the foregoing review, the enclosed Grading Plans (Figures 1 and 2) represent a feasible concept for project development from a geotechnical viewpoint. Geologic and soils conditions at the site remain the same as reported in the referenced reports except where indicated herein. Consequently, all conclusions and recommendations provided in the referenced reports remain valid and should be considered in the project designs and implemented during the construction phase except where specifically superseded or amended in the following sections. The following additional and/or amended recommendations are consistent with current site conditions and compatible with the proposed development plans and should be considered where applicable and appropriate:

- \* Graded cut slopes mark perimeter areas of much of the site. In 1999, the slopes were found mantled by a thick cover of loose soil generated from earlier blasting and grading operations. Recommendations were provided in the referenced 4 report for moisture conditioning and track-walking the impacted slopes in connection with site development. However, run-off erosion resulting from heavy rains during the previous 7 years has effectively removed the loose soil mantle and the need for remedial compaction efforts. The slopes presently support a healthy growth of vegetation and do not evidence instability. Additional grading of project cut slopes is therefore not warranted.

- \* The project pad surface is directly underlain by hard bedrock units (cut areas) which give way to compacted fill soils beneath the western portion as shown on Figures 1 and 2. Weathering of fill deposits during the previous 25 years has resulted in loose conditions in the upper soils section of the pad surfaces. Consequently, because of these conditions, removal and recompaction of the upper pad surface fills in selected areas is herein recommended as a means of re-densification of weathered fills to minimum standard levels (minimum 90%). Recommended removal elevations at selected areas of the pad surface are given on the enclosed Figures 1 and 2.

Specific removal depths should be given by the project geotechnical consultant in the field at the time of grading operations based on actual exposures. Locally deeper removals may be necessary and should be anticipated.

- \* Final pad grade ground Transitioning associated with site bedrock and fill soils will create non-uniform support for the planned site structures and improvements which requires mitigation including undercutting and reconstruction to design grades with compacted fills as recommended in the referenced reports (see Reference 2).
- \* Proposed site fine grading will chiefly consist of cut excavations and export operations with minor fills. Weathered and jointed rocks at the site will excavate with moderate to heavy efforts using larger dozers (Caterpillar D-8 or equal). Harder and more massive units will require added heavy ripping and more concentrated efforts which can impede undercutting, foundation trenching and utility line excavations. Consideration should be given to over-excavate bedrock areas along deeper utility lines during the fine grading operations. Heavy ripping or the use of rock breakers may be required depending on the depth of the planned trench excavations and utility line inverts. Undercut depths should extend to a minimum of 12 inches below the bottom of the footing and 6 inches below the design invert elevations.

Locally, hard rock conditions should also be expected for retaining wall back-cut excavations at the southeast corner. Heavy ripping or the use of rock breakers may be necessary.

- \* Earth materials generated from the site existing fills and weathered bedrock units are expected to consist of gravelly silty sand to silty sandy gravel (SM/GM) suitable for reuse as new compacted fills. However, excavations of harder

Mr. Rick Ryerson  
May 8, 2006  
Page 5

bedrock units will likely generate larger rock debris which should be selectively removed and excluded from the site fills and backfills.

Project fills and backfills shall be clean deposits free of trash, debris, organic matter and deleterious materials consisting of minus 6-inch particles and include at least 40% finer than #4 sieve materials by weight. Wall and trench backfills shall consist of minus 3-inch particles. Rocks larger than 6 inches in maximum diameter should not be allowed in site fills and should be properly disposed of from the site.

Uniform bearing soils conditions should be constructed at the site by the grading operations. Site soils should be adequately processed, thoroughly mixed, moisture conditioned to slightly (2%) above optimum moisture levels as directed in the field, placed in thin (8 inches maximum) uniform horizontal lifts and mechanically compacted to a minimum 90% of the corresponding laboratory maximum dry density per the ASTM D-1557, unless otherwise specified.

A minimum of 90% compaction levels will be required for all structural fills and wall/trench backfills unless otherwise specified. In the improvement areas, fills should also be compacted to a minimum 90% with the exception of the upper 12 inches under the asphalt paving surfaces where a minimum of 95% compaction levels will be required.

- \* All temporary slopes and wall back-cut excavations should be constructed as specified in the referenced reports. Added care will be required when excavating at or near off site improvements and structures. Excavations associated with the site constructions shall not be allowed to adversely impact nearby structures and improvements. Adequate excavation setbacks shall be maintained from the adjacent structures and improvements as directed in the field. Some shoring or trench shield support may be appropriate based on site conditions and should be anticipated.

Site grading and construction will not impact the adjacent properties provided our recommendations are incorporated into the final designs and implemented during the construction phase. Added field recommendations, however, may also be necessary and should be given by the project geotechnical consultant for the protection of adjacent properties and should be anticipated.

- \* Footings located on or adjacent to the top of descending slopes should be set back or extended to a sufficient depth to provide a minimum horizontal distance of 7 feet or one-third of the slope height, whichever is greater (need not exceed 40 feet maximum) between the bottom edge of the footing and face of slope. This requirement applies to all improvements and structures including fences, posts etc. Concrete and AC improvements should be provided with a thickened edge to satisfy this requirement.
- \* Preliminary asphalt and PCC pavement structural section designs are provided in the referenced reports. Minimum asphalt pavement sections provided in the referenced reports or the minimum structural section required by the City of Vista, whichever is more, may be considered for preliminary estimates.

Commercial/industrial PCC pavings, driveways and parking supported on very low (expansion index less than 21) subgrade soils should be a minimum of 5½ inches in thickness, reinforced with #3 reinforcing bars at 18 inches on centers each way, placed at mid-height in the slab. PCC fire lanes or pavings subject to heavy truck traffic should be a minimum of 6 inches in thickness, reinforced with #4 reinforcing bars at 18 inches on centers each way, placed at mid-height in the slab. Subgrade soils beneath the PCC paving surfaces should be compacted to a minimum 90% of the corresponding maximum dry density within the upper 6 inches.

Provide “tool joint” or “softcut” contraction/control joints spaced 10 feet on center (not to exceed 15 feet maximum) each way. Tool or cut as soon as the slab will support the weight and can be operated without disturbing the final finish which is normally within 2 hours after final finish at each control joint location or 150 psi to 800 psi. Tool or softcuts should be a minimum of 1-inch in depth but should not exceed 1¼-inches deep maximum. In case of softcut joints, anti-ravel skid plates should be used and replaced with each blade to avoid spalling and raveling. Avoid wheeled equipments across cuts for at least 24 hours.

Base section and subgrade preparations per structural section design will be required for all surfaces subject to traffic including roadways, travelways, drive aisles, driveway approaches and ribbon (cross) gutters. Driveway approaches within the public right-of-way should have 12 inches subgrade compacted to a minimum of 95% compaction levels and provided with a 95% compacted Class 2 base section per the structural section design. Base layer under curb and gutters should be compacted to a minimum of 95%, while subgrade soils under curb and gutters, and base and subgrade under sidewalks should be compacted to a minimum of 90% compaction levels. Base section may not be required under curb and gutters, and sidewalks in the case of very low expansive subgrade soils (expansion index less than 21). Appropriate recommendations should be given in the final as-graded compaction report.

Final designs will depend on engineering properties of finish subgrade soils, actual R-value results, design traffic index and approval of the City of Vista.

## **V. GRADING AND FOUNDATION PLAN REVIEW**

We also have reviewed the project grading, and foundation plans and details. Based on our review of drawings made available to us, and from a geotechnical engineering point

of view, the project grading plans, and foundation plans and details are in substantial compliance with the project geotechnical reports referenced herein and this transmittal. The following comments are also appropriate and should be considered and / or incorporated into the final plans where appropriate and applicable:

1. All remedial grading and earthworks should be performed in accordance with the referenced documents and this review report. The referenced reports and this review transmittal should be considered a part of the project grading and foundation plans.
2. Site retaining walls should be provided with well-developed back drain systems as specified in the referenced reports ( Plate 13 of Reference 4). Outlet pipe at suitable locations.
3. Surface waters and slope run-off shall not be allowed to impact the developed construction site and nearby improvements or over flow from top of walls. Building pad surface run-off should be collected and directed away from the planned buildings and improvements to a selected location in a controlled manner. A drainage ditch may be considered at the toe of the ascending slope and behind the planned retaining walls. Area drains should be considered throughout.
4. Based on the anticipated fine and remedial grading operations at the site, final foundation bearing and subgrade soils are anticipated to primarily consist of gravelly silty sand to silty sandy gravel (SM/GM) with very low expansion potential (expansion index less than 21) according to the California Building Code classification (Table 18A-I-B).
5. Based on the available plans, all interior slabs will be 5½ inches in thickness reinforced with #3 reinforcing bars spaced 18 inches on center each way, placed mid-height in the slab (concrete  $f'_c=4000$  psi). Reference 4 (dated February 15, 1999) recommends #4 reinforcing bars spaced 18 inches on center each way, placed mid-height in the slab. Slabs should be underlain by 4 inches of clean sand (SE 30 or greater) which is provided with a well performing moisture barrier/vapor retardant (minimum 10-mil plastic) placed mid-height in the sand.
6. It is our practice to recommend providing diagonally placed re-entrant corner reinforcement consisting 2-#3 @ 12" on centers (minimum 5 feet long) for all interior slabs at 270° corners with the first rebar placed 3 inches from the corner.

Mr. Rick Ryerson  
May 8, 2006  
Page 9

7. The final building pad and foundation constructions should be inspected, tested as necessary and approved by the project geotechnical engineer. Geotechnical engineering construction inspections and test results should be presented in written field and final as-constructed geotechnical reports. All recommendations should be further field verified, confirmed, or revised if necessary at that time based on actual as-graded soil properties.

Mr. Rick Ryerson  
May 8, 2006  
Page 10

If you have any questions or need clarification, please do not hesitate to contact the undersigned. Reference to our **Job #05-389-P** will help to expedite our response to your inquiries.

We appreciate this opportunity to be of service to you.

**VINJE & MIDDLETON ENGINEERING, INC.**

Dennis Middleton  
CEG #980

S. Mehdi S. Shariat  
RCE #46174

DM/SMSS/jt

Enclosures: Figures 1 - 4

Distribution: Addressee (3)  
Kenneth D. Smith Architect & Associates; Attn: Dave Ambler (1, fax)

c:/jt/myfiles/05planreviews.etc./05-389-P