Appendix C

Geotechnical Investigation

QUANTUM GEOTECHNICAL, INC.

Project No. H052.G
October 20, 2021

Ms. Samantha Hauser
Senior Vice President of Development
City Ventures
444 Spear Street
Suite 200
San Francisco, CA 94105

Subject: Proposed Townhome and Commercial Development
18605 Monterey Road
Morgan Hill 8
Morgan Hill, California
GEOTECHNICAL ENGINEER OF RECORD

Reference: Geotechnical Investigation Report
Project No. 10218.G
Gateway Center Business Park
By Terrasearch, Inc
Dated 7 May 2004

Dear Ms. Hauser:

This is to confirm that City Ventures has retained Quantum Geotechnical, Inc., to provide consultation and observation and testing services during construction of the subject project.

The referenced report prepared geotechnical recommendations for a commercial development. The level of investigation performed in the referenced report is sufficient for the proposed residential development, and many of the recommendations are generally applicable for a residential development. We are currently preparing an updated geotechnical report to provide updated seismic design and specific recommendations for the proposed residential development. As such, Quantum Geotechnical, Inc., will become the Geotechnical Engineer of Record for the project.

Should you have any questions or require additional information, please contact our office at your convenience.

Sincerely,
Quantum Geotechnical, Inc.

Simon Makdessi, P.E, G.E.
President

6288 San Ignacio Avenue, Suite A, San Jose, CA 95119 Phone (408)-629-3822 Facsimile (408) 629-3825
1110 Burnett Avenue, Suite B, Concord, CA 94520 Phone: (925) 788-2751

COPY

GEOTECHNICAL INVESTIGATION
for Proposed
Gateway Center
Business Park
Morgan Hill, California
for
SOUTH VALLEY DEVELOPERS

By

TERRASEARCH, inc.

Project No. 10218.G
7 May 2004

Project No. 10218.G
7 May 2004

Mr. Scott Schilling
South Valley Developers
16060 Caputo Drive, Suite 160
Morgan Hill, CA 95037

SUBJECT: Proposed *Gateway Center* Commercial Development
18605 Monterey Road
Morgan Hill, California
GEOTECHNICAL INVESTIGATION

Dear Mr. Schilling:

In accordance with your authorization, ***TERRASEARCH, inc.***, has investigated the soil conditions for the proposed New *Gateway Center* Commercial Development to be located at 18605 Monterey Road in the City of Morgan Hill, California.

The accompanying report presents our conclusions and recommendations based on our investigation. Our findings indicate, that from a geotechnical standpoint, the site is suitable for the proposed Gateway Center Commercial Development provided the recommendations of this report are carefully followed and are incorporated into the project plans and specifications. In addition, any applicable setbacks, easements, and requirements set by the City of Morgan Hill and any other governmental agencies should be adhered to.

Should you have any questions relating to the contents of this report or should you require additional information, please do not hesitate to contact our office at your convenience.

Very truly yours,
TERRASEARCH, inc.,

George Makdissy, P.E.
Senior Engineer

Robert Pollak, P.E.
Senior Engineer

Copies: **5 to Mr. Schilling**

TABLE OF CONTENTS

Page No.

GEOTECHNICAL INVESTIGATION

Purpose and Scope

This report presents the results of our Geotechnical Investigation for the proposed *Gateway Center* Commercial Development to be located at 18605 Monterey Road in the City of Morgan Hill, California. The purpose of our investigation was to evaluate the soil conditions at the site and to establish geotechnical recommendations for the proposed development. The geotechnical recommendations are based on our evaluation and investigation, and on a site plan by EDI Architecture, issue dated February, 2004.

The scope of work for our investigation included:

a. A site reconnaissance by the Project Soil Engineer;
b. Field exploration including 3 drilled borings, and sub-surface soil sampling;
c. Laboratory testing of soil samples obtained in the field;
d. Engineering analysis of laboratory and field investigations;
e. Establishment of geotechnical parameters; and
f. Preparation of this report.

Proposed Development

The proposed development is understood to consist of the construction of two new light commercial structures and associated grade level parking. It is assumed that the buildings will be of conventional construction.

Site Description

The site is irregular in shape and is approximately 2.66 acres in areal extent. The site is bounded by a commercial development to the northwest and undeveloped land to the northeast and southeast. Railroad tracks, placed on a relatively small embankment run along the southwest perimeter of the property. A shallow drainage swale lies parallel and northeast of the embankment. The swale receives water from a culvert which passes under the railroad embankment. A shallow retention pond is located near the west corner of the site and is part of the drainage system. At the time of our field investigation, an 18 inch diameter storm line was being installed across the property to intercept the swale, and presumably replace the retention pond and swale. The storm line will discharge to the east.

The site was vacant at the time of our investigation and relatively devoid of flora, however, considerable rubble, including construction debris and dumped soil were encountered.

This site description is based on our site reconnaissance by the Soils Engineer, and on the referenced site plan.

Subsurface Conditions

The test borings indicate that the site near surface soils are variable and generally consist of firm to hard, silt, clay, sand, and gravel to the depths explored. Heavy gravel was encountered in Boring 1 at a depth of 28½ feet. Plasticity testing indicates that the surficial clay soil has a low propensity to expand when exposed to increases in moisture content.

No groundwater was encountered in our borings. While it is possible that ground water levels may rise during prolonged periods of rainfall, it is not anticipated that groundwater will affect the proposed development.

Seismic Considerations

Because of its proximity to the San Andreas Fault system, Santa Clara County is considered to be one of the most seismically active regions in the United States. Since historic records have been kept in the region, major earthquakes have been recorded on the San Andreas and Hayward Faults.

The San Andreas Fault, located approximately 17½ kilometers to the southwest, is the most likely fault to affect the site with potentially destructive strong ground motions. Other known active faults that may subject the site to intense shaking are the Calaveras (south), the Sargent Fault, and the Zayanta -Vergeles Fault, located 6 kilometers to the northeast, and 12 and 22½ kilometers to the southwest respectively.

Seismic Hazards

Seismic hazards can be divided into two broad classifications; 1) Primary hazards such as seismic shaking and damage produced directly from fault surface ruptures, and 2) Secondary hazards produced by seismic shaking including landslides, lurching, floods, subsidence, and liquefaction.

Primary Hazards

The project site is not within the boundaries of the Alquist-Priolo Special Studies Zone and no faults are known to lie within the site. The likelihood of a surface fault rupture occurring on this site is considered low. Based on historical evidence however, it is likely that at least one significant earthquake will produce strong ground motions at this site during the design life of the proposed structures. Structural considerations for construction on this site should include the seismic design parameters listed under UBC Seismic Design Criteria below.

Secondary Hazards

The distance of the subject site from rivers and other bodies of water makes secondary earthquake hazards from, flooding (from tsunamis, seiches, and damn failures) or lateral spreading highly improbable.

Liquefaction Potential

Liquefaction describes the phenomenon wherein soils lose their supportive strength and become prone to rapid settlement and loss of bearing capacity. Liquefaction occurs during earthquake conditions in saturated, relatively loose, sandy soils located near the ground surface.

Based on the soil types, groundwater level, and blow counts (N-counts) taken during our field investigation, the liquefaction potential on this site is considered very low, even if during the course of the project design life, the groundwater should rise to an unprecedented level.

Seismic Conclusions

The most significant seismic hazard is that of shaking. The structural design of the proposed buildings should anticipate repeatable horizontal ground accelerations. A prudent structural design should incorporate the current state of practice for seismic loads listed in UBC Seismic Design Criteria and the potential for seismically induced settlements as described above.

UBC Seismic Design Criteria

The 1997 Uniform Building Code, Chapter 16, Division IV Earthquake Design requires near-source factors to be used for sites in Seismic Zone 4 that are within certain distances of critical faults. In 1998, the International Conference of Building Officials (ICBO) published a map folio to be used in scaling distances to the critical faults. According to this map folio, the site is within 17½ km of a Type A fault, the San Andreas Fault, and 6 km from the Calaveras Fault, a Type B fault.

Based on Tables 16-R, S and T of the 1997 Uniform Building Code and the data presented in this report, a summary of the earthquake design criteria for use in the design of the proposed structures is as follows:

Seismic Zone	=	4
Soil Profile Type	=	S_D
Near Source Factor, N_a	=	1.0
Near Source Factor, N_v	=	1.17

DISCUSSIONS, CONCLUSIONS AND RECOMMENDATIONS

General

1) From a geotechnical standpoint, the site is suitable for the proposed development provided the recommendations presented in this report are incorporated into the project plans and specifications. In addition any other requirements set by the City of Morgan Hill and any other governmental agencies should be followed.

2) The most prominent geotechnical considerations on this site are the probability of seismic shaking during the design life of the project, and the presence of non-engineered fill.

3) The proposed structures may be satisfactorily supported on conventional spread footings.

4) All foundation plans for the improvements must be reviewed by the Soil Engineer prior to contract bidding or submittal to governmental agencies so that plans are reconciled with site conditions and sufficient time is allowed for suitable mitigative measures to be incorporated into the final specifications.

5) *TERRASEARCH, inc.*, should be notified at least two working days prior to foundation operations. This will give the Soil Engineer ample time to discuss the problems that may be encountered in the field and coordinate the work with the contractor.

6) Field observation and testing during the grading operations must be provided by representatives of *TERRASEARCH, inc.*, to enable them to form an opinion regarding the adequacy of the site preparation, and the extent to which the earthwork construction comply with the specification requirements. Any work related to the foundation operations performed without the full knowledge and under the direct observation of the Soil Engineer will render the recommendations of this report invalid. The degree of observation and frequency of testing services would depend on the construction methods and schedule, and the item of work.

Site Clearing and Preparation

7) It is not anticipated that demolition will be required on this site, however, if during the course of grading operations any concrete foundations, septic tanks, underground utilities, storage tanks, or any other sub-surface structures are encountered, they must be removed. Any tree root system, debris or trash that are encountered should also be removed. It is vital that *TERRASEARCH, inc.* observe the grading operation and be notified in ample time to ensure compliance with these requirements.

8) At the time of our investigation, there was sparse vegetation on the majority of the site. It is not anticipated that stripping will be necessary, however if excessive vegetation is present at the commencement of grading operations, the surface of the site in areas containing that vegetation should be stripped to remove the vegetation and/or other deleterious material. The need and actual depth of stripping will be determined in the field by the Soil Engineer at the time the grading operations commence.

9) All non-engineered fill and loose or soft soils must be excavated to firm/stiff native ground. Following removal of non-engineered fill and loose and/or soft soil, the top 8 inches of exposed native ground should be scarified and compacted to a minimum degree of relative compaction of 90% at a moisture content above optimum as determined by ASTM D1557-91 Laboratory Test Procedure. Materials generated from loose/soft soils may be used as engineered fill with the approval of the Soil Engineer provided they do not contain debris.

Spread Footing Foundation

10) A spread footing foundation system may be used provided that a drainage system be incorporated into the project design to prevent introduction of irrigation or storm water into the foundation sub-grade soils.

11) Spread footings should be embedded to a minimum depth of 24 inches below the lowest adjacent pad grade (i.e., trenching depth). Interior footings may have a minimum embedment of 18 inches below the adjacent pad grade. At these depth, the recommended design bearing pressure for the continuous footings or isolated footings should not exceed 3000 p.s.f. due to dead loads and sustainable live loads, and 4000 p.s.f. for all loads including wind and seismic loads. **Footings are to be reinforced as required by the structural engineer and in accordance with structural requirements.**

12) To accommodate lateral building loads, the passive resistance of the foundation soil can be utilized. The passive soil pressures can be assumed to act against the front face of the footing below a depth of one foot below the ground surface. For design purposes, it is recommended that a passive pressure equivalent to that of a fluid weighing 325 p.c.f. be used. An allowable friction coefficient of 0.30 can be assumed at the base of the spread footing.

13) Structural design should anticipate differential movements of up to ½" in 25 feet.

General Slab Construction for Spread Footings or Exterior Slab on Grade

14) To reduce the potential cracking of concrete slabs, the following are recommended:

a. A minimum of 4 inches of gravel or clean crushed rock material should be placed between the finished subgrade and the slabs to serve as a capillary break between the subsoil and the slab. The use of aggregate base beneath the slab will not provide a capillary break, however, if floor coverings or potential moisture condensation on the floor slab is not an issue, aggregate base may be used. See the "Guide Specifications For Rock Under Floor Slabs", Appendix C.

b. Cast in place concrete slabs on grade supporting floor coverings should be provided with measures to prevent condensation caused by temperature differentials from harming floor coverings. One method to reduce condensation is to place a waterproof membrane between a 2" sand cushion and the 4 inches of gravel. The waterproof membrane shall be overlapped adequately to provide a continuous waterproof membrane barrier under the entire slab. Care must be taken to ensure that the waterproof membrane does not become torn and entangled with the reinforcing.

c. All slabs should be reinforced with a minimum of No. 3 bars spaced 18 in. center to center in both directions. The reinforcement shall be placed in the center of the slab unless otherwise designated by the design engineer.

d. Slabs at door openings should be constructed with a curl or a thickened edge extending a minimum of 12 inches into native ground or compacted fill.

Utility Trenches

15) Applicable safety standards require that trenches in excess of 5 feet in depth must be properly shored or that the walls of the trench slope back to provide safety for installation of lines. If trench wall sloping is performed, the inclination should vary with the soil type. The underground contractor should request an opinion from the Soil Engineer as to the type of soil and the resulting inclination.

16) With respect to state-of-the-art construction or local requirements, utility lines are generally bedded with granular materials. These materials can convey surface or subsurface water beneath the structures. Therefore all utility trenches which possess the potential to transport water must be sealed with grout where the trench enters/exits the building perimeter. This impervious seal should extend a minimum of 2 feet away from the building perimeter. The Project Soil Engineer must observe the grouting operations.

17) Utility trenches must be backfilled with native or approved import material and compacted to relative compaction of 90% in accordance with Laboratory Test Procedure ASTM D1557-91. Backfilling and compaction of these trenches must meet the requirements set forth by the City of Morgan Hill, Building and Engineering Services Department.

Pavement Design

18) After installation of underground facilities, the top 6 inches of subgrade soils under the pavements should be compacted to a minimum relative compaction of 95% based on the ASTM D1557-91 test method. Aggregate base should also be compacted to a minimum relative compaction of 95% based on the above test method.

19) Based on testing of the surface soils, an "R-Value" of 15 can be used for the near surface soils encountered on the site. The recommended design sections presented in Table 2 were calculated in accordance with the methods presented in the latest update of the 4th Edition of the California Department of Transportation Highway Design Manual. The Table 2 design sections may be utilized provided that the subgrade is founded within the native material or within imported material of equal to or greater "R-Value."

20) It is customary that a Traffic Index (T.I.) of 4.5 to 5.0 be used for design of pavements for automobile use only. All pavement sections should be designed for Traffic Indices in accordance with applicable standards and with the City of Morgan Hill or Caltrans.

Table 2: Recommended Asphalt Concrete Pavement Sections

DESIGN TRAFFIC INDEX	ASPHALT CONCRETE (TYPE B)	AGGREGATE BASE (CLASS 2)
4.5	3.00 in.	7.0 in.
5.0	3.00 in.	7.5 in.
5.5	3.00 in.	10.0 in.

21) After the sub-grade is established, it is recommended that R-value samples be obtained and tested so that an accurate pavement section is obtained.

General Construction Requirements

22) Liberal drainage gradients must be provided by the project Civil Engineer to remove all storm water from the vicinity of the foundation and to prevent storm and/or irrigation water from seeping beneath the structures. Should surface water be allowed to seep under the structure, foundation movement resulting in structural damage may occur. All compacted, finished grades should be sloped at a minimum 2% gradient away from the exterior foundation for a minimum distance of 3 feet. Should the recommended surface gradient not be constructed by the developer as designed by the project Civil Engineer, or should the owner alter the surface drainage provided by the developer, then a sub-drain system should be constructed around the perimeter of the structures. Specific recommendations for sub-drain construction will be provided upon request.

23) Where practicable, the building perimeter should be abutted with hardscape.

24) Downspouts from the gutters should be provided with adequate, non-perforated pipe conduits to carry storm water away from the structures and graded areas and, thus, reduce the possibility of soil saturation adjacent to the foundation and engineered fills.

25) Flower beds or planters are not recommended adjacent to the building foundations because of the possibility of irrigation water affecting the foundations and cast concrete slabs-on-grade. Should planters be constructed, foliage requiring little irrigation should be planted. It is preferred that irrigation adjacent to the building foundations consist of a drip system. Sprinkler systems may be used; however, it is preferred that sprinkler heads do not water closer than 3 feet from the building foundations. If sprinklers are used within 3 feet, then excessive watering should not be allowed; and good surface drainage in the planter area must be provided.

26) If planters are used adjacent to the building foundations, the planters should be provided with a sub-drain system equipped with closed-pipe conduits to discharge surplus irrigation water away from the foundations to a location approved by the project civil engineer. In any case, it is recommended that area surface drains be incorporated into the landscaping to discharge any excessive irrigation or rainwater that may accumulate in the planter area. These surface drains must be constructed in a manner that easy flow of surface water runoff is allowed into the pipe inlets.

27) **Foundations recommendations included in this report assume that the foundation soils will remain in their present unsaturated condition. Saturation of the foundation soils may result in differential movements in the foundation.** If it is anticipated that the proposed footings may be subjected to moisture intrusions due to storm water or any other sources, then a subdrain system should be considered for those areas which may be effected. Terrasearch, inc. will be pleased to provide such recommendations upon request.

28) To reduce pavement damage, landscape islands adjacent to paved parking areas should be equipped with an adequate sub-drain system to discharge irrigation water away from pavement and structures to a location approved by the project civil engineer.

GUIDELINES FOR REQUIRED SERVICES

The following list of services are the services required and must be provided by ***TERRASEARCH, inc.***, during the project development. These services are presented in check list format as a convenience to those entrusted with their implementation.

The items listed are included in the body of the report in detail. This list is intended only as an outline of the required services and does not replace specific recommendations and, therefore, must be used with reference to the total report. The degree of observation and frequency of testing services would depend on the construction methods and schedule, and the item of work.

The importance of careful adherence to the report recommendations cannot be overemphasized. It should be noted, however, that this report is issued with the understanding that each step of the project development will be performed under the direct observation of ***TERRASEARCH, inc.***

The use of this report by others presumes that they have verified all information and assume full responsibility for the total project.

	Item Description	Required	Not Required	Not Anticipated
1.	Provide foundation design parameters	X		
2.	Review grading plans and specifications	X		
3.	Review foundation plans and specifications	X		
4.	Observe and provide recommendations regarding demolition			X
5.	Observe and provide recommendations regarding site stripping	X		
6.	Observe and provide recommendations on moisture conditioning, removal, and/or compaction of unsuitable existing soils	X		
7.	Observe and provide recommendations on the installation of sub-drain facilities(if necessary)	X		
8.	Observe and provide testing services on fill areas and/or imported fill materials	X		
9.	Review as-graded conditions and provide additional foundation recommendations, if necessary	X		
10.	Observe and provide compaction tests on sanitary sewers, storm drain, water lines and PG&E trenches	X		
11.	Observe foundation excavations and provide supplemental recommendations, if necessary prior to placing concrete	X		
12.	Observe and provide moisture conditioning recommendations for foundation areas prior to placing concrete	X		
13.	Provide design parameters for retaining walls			X
14.	Provide geologic observations and recommendations for keyway excavations and cut slopes during grading		X	
15.	Excavate and re-compact all geologic trenches and/or test pits		X	
16.	Observe installation of sub-drain behind retaining walls			X

LIMITATIONS AND UNIFORMITY OF CONDITIONS

1. It should be noted that it is the responsibility of the owner or his representative to notify *TERRASEARCH, inc.*, in writing, a minimum of two working days before any clearing, grading, or foundation excavations can commence at the site.

2. The recommendations of this report are based upon the assumption that the soil conditions do not deviate from those disclosed in the borings and from a reconnaissance of the site. Should any variations or undesirable conditions be encountered during the development of the site, *TERRASEARCH, inc.*, will provide supplemental recommendations as dictated by the field conditions.

3. This report is issued with the understanding that it is the responsibility of the owner, or his representative, to ensure that the information and recommendations contained herein are brought to the attention of the Architect and Engineer for the project and incorporated into the plans and that the necessary steps are taken to see that the Contractor and Subcontractors carry out such recommendations in the field.

4. At the present date, the findings of this report are valid for the property investigated. With the passage of time, significant changes in the conditions of a property can occur due to natural processes or works of man on this or adjacent properties. In addition, legislation or the broadening of knowledge may result in changes in applicable standards. Changes outside of our control may render this report invalid, wholly or partially. Therefore, this report should not be considered valid after a period of two (2) years without our review, nor should it be used, or is it applicable, for any properties other than those investigated.

5. Not withstanding, all the foregoing applicable codes must be adhered to at all times.

APPENDIX A

Field Investigation

Site Plan

Logs of Test Borings

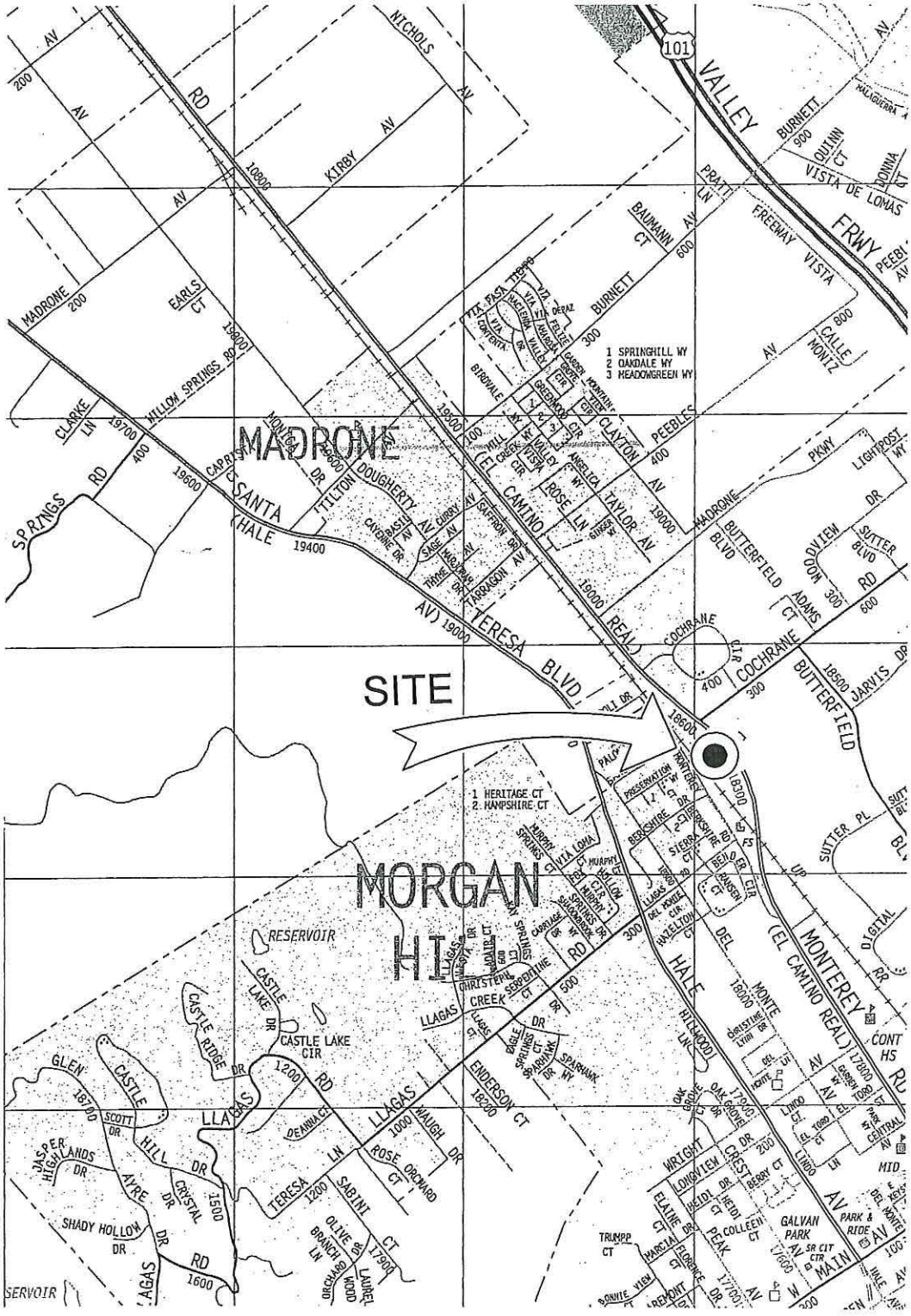
FIELD INVESTIGATION

The field investigation was performed on 26 April 2004 and included a reconnaissance of the site and the drilling of 3 exploratory borings at the approximate locations shown on Figure 2, "Site Plan."

The borings were drilled to a maximum depth of 30 feet below the existing ground surface. The drilling was performed with a Mobile B3500 truck mounted drilling equipment using power-driven, 6-inch diameter, continuous flight augers. Visual classifications were made from auger cuttings and the samples in the field. As the drilling proceeded, relatively undisturbed soil samples were obtained by means of a 2 ½ inch O. D. split spoon sampler containing 2 inch diameter brass liners. The sampler was advanced into the soil under the impact of a 140 pound hammer having a free fall of 30 inches. The number of blows required to advance the sampler 12 inches into the soil (after seating the sampler the first six inches) were adjusted to the standard penetration resistance (N-Value).Soil samples were taken of the surface soils, and the underlying silty fine sands.

The samples were sealed and returned to our laboratory for testing. Classifications made in the field were verified in the laboratory after further examination and testing.

The stratification of the soils, descriptions, and location of undisturbed soil samples are shown on the respective "Logs of Test Borings" contained within this appendix.



BASE: By Thomas Guide

1 inch = 1900 feet

Project No. 10218.G	May, 2004	LOCATION MAP	FIGURE NO. 1
TERRASEARCH, inc.		Gateway Center Morgan Hill, California	

LOGGED BY RJP DATE DRILLED 26 April 2004 BORING DIAMETER 6" BORING NO. B-1

Depth, ft.	Sample No. and Type	Symbol	SOIL DESCRIPTION	Unified Soil Classification	Blows/foot 350 ft-lbs	Qu - tsf Penetrometer	Dry Density p.c.f.	Moisture % dry wt.	MISC. LAB RESULTS
			Medium brown SAND & GRAVEL; damp, medium dense, Af	SW					
			Medium brown Silty CLAY; damp, medium stiff to hard	CL	12		110.8	14.0	c = 400psf ø = 30° LL = 28 PI = 12
5					39		116.5	15.6	
			Orangish brown Clayey Silty SAND; damp, dense	SM					
10			Medium brown SAND & GRAVEL; damp, dense, gravel sub-rounded to 2"ø	GW	28		123.3	7.7	
15									
			Slightly orange brown Silty CLAY; damp, hard, some gravel	CL					
20					>50		118.3	13.4	
25			@ 25' some rounded gravel to ¾"ø						
			@ 28½' heavy gravel	GW					
30			Terminated @ 30' bgs No Groundwater encountered						

TERRASEARCH, inc. | **PROJECT NO. 10218.G** | **FIGURE NO. 3**

LOGGED BY RJP DATE DRILLED 26 April 2004 BORING DIAMETER 6" BORING NO. B-2

Depth, ft.	Sample No. and Type	Symbol	SOIL DESCRIPTION	Unified Soil Classification	Blows/foot 350 ft-lbs	Qu - tsf Penetrometer	Dry Density p.c.f.	Moisture % dry wt.	MISC. LAB RESULTS
			Medium brown SILT, SAND & GRAVEL; damp, medium dense, Af	SW					
5			Medium brown f. Sandy SILT; damp, stiff	ML	10		106.7	11.8	
10			Medium brown Silty SAND & GRAVEL; damp, medium dense	SW	17		118.0	12.7	
15			Slightly orange brown Clayey SILT; damp, hard, some gravel	ML					
20			Terminated @ 20' bgs No Groundwater encountered						
25									
30									

TERRASEARCH, inc. | **PROJECT NO. 10218.G** | **FIGURE NO. 4**

LOGGED BY RJP DATE DRILLED 26 April 2004 BORING DIAMETER 6" BORING NO. B-3

Depth, ft.	Sample No. and Type	Symbol	SOIL DESCRIPTION	Unified Soil Classification	Blows/foot 350 ft-lbs	Qu - tsf Penetrometer	Dry Density p.c.f.	Moisture % dry wt.	MISC. LAB RESULTS
			Medium brown Silty CLAY; damp, hard	CL	32		109.7	18.6	
5			Orangish brown Clayey SAND; damp, dense, some Gravel	SC	37		123.0	8.9	
			Orange brown Silty SAND & GRAVEL; damp, dense	SW					
10					22		117.4	12.1	
15									
			Slightly orange brown Silty CLAY; damp, hard, some gravel	CL					
20					29		105.6	14.7	
			↓ increasing Clay						
25									
			Olive brown Silty CLAY; damp, stiff	CL					
30			Terminated @ 30' bgs No Groundwater encountered						

TERRASEARCH, inc. | **PROJECT NO. 10218.G** | **FIGURE NO. 5**

APPENDIX B

Laboratory Investigation

Summary of Laboratory Test Results

LABORATORY INVESTIGATION

The laboratory testing program was directed towards providing sufficient information for the determination of the engineering characteristics of the site soils so that the recommendations outlined in this report could be formulated.

Moisture content and dry density tests (ASTM D2937-83) were performed on representative relatively undisturbed soil samples in order to determine the consistency of the soil and the moisture variation throughout the explored soil profile as well as estimate the compressibility of the underlying soils.

The strength parameters of the foundation soils were determined from a direct shear test performed on a selected relatively undisturbed soil sample.

Soil expansivity characteristics were tested by means of plasticity tests performed on a select soil sample.

A summary of all laboratory test results is presented on TABLE 3 of this appendix and on the respective "Logs of Borings", Appendix A.

TABLE 3

Summary of Laboratory Test Results

				Atterberg Limits			
Sample No.	Depth (ft.)	Dry Density (p.c.f.)	Moisture Content (% Dry Wt.)	Liquid Limit (%)	Plasticity Index	Direct Shear Test c (psf)	Direct Shear Test Phi (°)
1-1	2	110.8	14.0	28	12	400	30°
1-2	5	116.5	15.6				
1-3	10	123.3	7.7				
1-4	20	118.3	13.4				
2-1	5	106.7	11.8				
2-2	10	118.0	12.7				
3-1	2	109.7	18.6				
3-2	5	123.0	8.9				
3-3	10	117.4	12.1				
3-4	20	105.6	14.7				

APPENDIX C

The Grading Specifications

Guide Specifications For Rock Under Floor Slabs

THE GRADING SPECIFICATIONS
on
Proposed Gateway Center
18605 Monterey Road
Morgan Hill, California

1. General Description

1.1 These specifications have been prepared for the grading and site development of the subject project. ***TERRASEARCH, inc.***, hereinafter described as the Soil Engineer, should be consulted prior to any site work connected with site development to ensure compliance with these specifications.

1.2 The Soil Engineer should be notified at least two working days prior to any site clearing or grading operations on the property in order to observe the stripping of organically contaminated material and to coordinate the work with the grading contractor in the field.

1.3 This item shall consist of all clearing or grubbing, preparation of land to be filled, filling of the land, spreading, compaction and control of fill, and all subsidiary work necessary to complete the grading of the filled areas to conform with the lines, grades, and slopes as shown on the accepted plans. The Soil Engineer is not responsible for determining line, grade elevations, or slope gradients. The property owner, or his representative, shall designate the person or organizations who will be responsible for these items of work.

1.4 The contents of these specifications shall be integrated with the soil report of which they are a part, therefore, they shall not be used as a self-contained document.

2. Tests

The standard test used to define maximum densities of all compaction work shall be the ASTM D1557-91 Laboratory Test Procedure. All densities shall be expressed as a relative compaction in terms of the maximum dry density obtained in the laboratory by the foregoing standard procedure.

3. Clearing, Grubbing, and Preparing Areas To Be Filled

3.1 All vegetable matter, trees, root systems, shrubs, debris, and organic topsoil shall be removed from all structural areas and areas to receive fill.

3.2 Any soil deemed soft or unsuitable by the Soil Engineer shall be removed. Any existing debris or excessively wet soils shall be excavated and removed as required by the Soil Engineer during grading.

3.3 If found, underground structures shall be removed from the site such as old foundations, abandoned pipe lines, septic tanks, and leach fields.

3.4 The final stripped excavation shall be approved by the Soil Engineer during construction and before further grading is started.

3.5 After the site has been cleared, stripped, excavated to the surface designated to receive fill, and scarified, it shall be disked or bladed until it is uniform and free from large clods. The native subgrade soils shall be moisture conditioned and compacted to the requirements as specified in the grading section of this report. Fill can then be placed to provide the desired finished grades. The contractor shall obtain the Soil Engineer's approval of subgrade compaction before any fill is placed.

4. Materials

4.1 All fill material shall be approved by the Soil Engineer. The material shall be a soil or soil-rock mixture which is free from organic matter or other deleterious substances. The fill material shall not contain rocks or lumps over 6 inches in greatest dimension and not more than 15% larger than 2-1/2 inches. Materials from the site below the stripping depth are suitable for use in fills provided the above requirements are met.

4.2 Materials existing on the site are suitable for use as compacted engineered fill after the removal of all debris and organic material. All fill soils shall be approved by the Soil Engineer in the field.

4.3 Should import material be required, it must meet the requirements as specified in the body of this report prior to transporting it to the project.

5. Placing, Spreading, and Compacting Fill Material

5.1 The fill materials shall be placed in uniform lifts of not more than 8 inches in uncompacted thickness. Each layer shall be spread evenly and shall be thoroughly blade mixed during the spreading to obtain uniformity of material in each layer. Before compaction begins, the fill shall be brought to a water content that will permit proper compaction by either (a) aerating the material if it is too wet, or (b) spraying the material with water if it is too dry.

5.2 After each layer has been placed, mixed, and spread evenly, either import material or native material shall be compacted to a relative compaction of 90% at a moisture content above optimum as determined by ASTM D1557-91 Laboratory Test Procedure.

5.3 Compaction shall be by footed rollers or other types of acceptable compacting rollers. Rollers shall be of such design that they will be able to compact the fill to the specified density. Rolling shall be accomplished while the fill material is within the specified moisture content range. Rolling of each layer shall be continuous over its entire area and the roller shall make sufficient trips to ensure that the required density has been obtained. No ponding or jetting shall be permitted.

5.4 Field density tests shall be made in each compacted layer by the Soil Engineer in accordance with Laboratory Test Procedure ASTM D2922-91 and D3017-88. When footed rollers are used for compaction, the density tests shall be taken in the compacted material below the surface disturbed by the roller. When these tests indicate that the compaction requirements on any layer of fill, or portion thereof, has not been met, the particular layer, or portion thereof, shall be reworked until the compaction requirements have been met.

5.5 No soil shall be placed or compacted during periods of rain nor on ground which contains free water. Soil which has been soaked and wetted by rain or any other cause shall not be compacted until completely drained and until the moisture content is within the limits hereinbefore described or approved by the Soil Engineer. Approval by the Soil Engineer shall be obtained prior to continuing the grading operations.

6. Pavement

6.1 The proposed subgrade under pavement sections, native soil, and/or fill shall be compacted to a minimum relative compaction of 95% at a moisture content slightly above optimum for a depth of 6 inches.

6.2 All aggregate base material placed subsequently should also be compacted to a minimum relative compaction of 95% based on the ASTM Test Procedure D1557-91. The construction of the pavement in the parking and traffic areas should conform to the requirements set forth by the latest Standard Specifications of the Department of Transportation of the State of California and/or City of Morgan Hill, Building and Engineering Services Department.

6.3 It is recommended that soils at the proposed subgrade level be tested for a pavement design after the preliminary grading is completed and the soils at the site design subgrade levels are known.

7. Utility Trench Backfill

7.1 The utility trenches extending under concrete slabs-on-grade shall be backfilled with native on-site soils or approved import materials and compacted to the requirements pertaining to the adjacent soil. No ponding or jetting will be permitted.

7.2 Utility trenches extending under all pavement areas shall be backfilled with native or approved import material and properly compacted to meet the requirements set forth by the City of San Jose, Department of Public Works.*

*NOTE: Requirements of City to be added.

7.3 Where any opening is made under or through the perimeter foundations for such items as utility lines and trenches, the openings must be resealed so that they are watertight to prevent the possible entrance of outside irrigation or rain water into the underneath portion of the structures.

8. Subsurface Line Removal

8.1 The methods of removal will be designated by the Soil Engineer in the field depending on the depth and location of the line. One of the following methods will be used.

8.2 Remove the pipe and fill and compact the soil in the trench according to the applicable portions of sections pertaining to compaction and utility backfill.

8.3 The pipe shall be crushed in the trench. The trench shall then be filled and compacted according to the applicable portions of Section 5.

8.4 Cap the ends of the line with concrete to prevent entrance of water. The length of the cap shall not be less than 5 feet. The concrete mix shall have a minimum shrinkage.

9. Unusual Conditions

In the event that any unusual conditions not covered by the special provisions are encountered during the grading operations, the Soil Engineer shall be immediately notified for additional recommendations.

GUIDE SPECIFICATIONS FOR ROCK UNDER FLOOR SLABS

Definition

Graded gravel or crushed rock for use under slabs-on-grade shall consist of a minimum thickness of mineral aggregate placed in accordance with these specifications and in conformance with the dimensions shown on the plans. The minimum thickness is specified in the accompanying report.

Material

The mineral aggregate shall consist of broken stone, crushed or uncrushed gravel, quarry waste, or a combination thereof. The aggregate shall be free from deleterious substances. It shall be of such quality that the absorption of water in a saturated dry condition does not exceed 3% of the oven dry weight of the sample.

Gradation

The mineral aggregate shall be of such size that the percentage composition by dry weight, as determined by laboratory sieves (U.S. Sieves) will conform to the following gradation:

Sieve Size	Percentage Passing
¾"	90-100
No. 4	25-40
No. 8	18-33
No. 200	0-3

Placing

Subgrade, upon which gravel or crushed rock is to be placed, shall be prepared as outlined in the accompanying soil report.