CORNERSTONE EARTH GROUP

Date: June 7, 2022
Project No.: 230-1-10

Prepared For: Mr. Jack Chamberlain and Mr. Noel Chamberlain
TICONDEROGA PARTNERS, LLC
655 Skyway, Suite 230
San Carlos, California 94070

Re: Geotechnical Observation and
Testing Services
Highland Estates Lot 9
2185 Cobblehill Place
San Mateo, California

Introduction

In this letter we summarize the results of our geotechnical observation and testing services at the referenced development. We previously performed a geotechnical investigation for the development and presented the results in our October 30, 2015 report titled, "Updated Geotechnical Investigation Highland Estates Lots 5 through 11, San Mateo, California."

Project Description

Lot 9 is located at 2185 Cobblehill Place, San Mateo, California. The project consisted of construction of a split-level 2 story single family home supported on a drilled pier and grade beam foundation. The upper level has a finished floor at Elevation 500 feet and the lower-level finish floor is at Elevation 491.5 feet. Site work included keyway and benched fill, utilities, flatwork, landscaping, and other improvements necessary for site development.

Earthwork Recommendations

As referenced below, compaction tests were determined relative to the maximum dry density and optimum moisture content established by ASTM Test Designation D1557, latest edition. A general summary of the earthwork recommendations for the project from our October 30, 2015 report and the project plans and specifications is as follows:

1. Site clearing, including stripping of surface vegetation, designated trees and shrubs and associated roots, removal of pavements and abandoned utility lines.

2. Compacting fill as well as scarified surface soils in those areas to receive fill or slabs-on-grade to at least 90 percent relative compaction at a moisture content at least 1 percent above laboratory optimum moisture content, except for expansive clay soils which were to be compacted to between 87 to 92 percent relative compaction at a moisture content at least 3 percent over optimum. Fills greater than 5 feet in depth were to be compacted to at least 95 percent relative compaction for the portion of fill below the upper 5 feet.

3. Compaction of fill material for utility trench backfill to at least 90 percent relative compaction at a moisture content at least 1 percent above laboratory optimum moisture content, except for expansive clay soils which were to be compacted to between 87 to 92 percent relative compaction at a moisture content at least 3 percent over optimum.

4. Foundation excavation in accordance with the recommendations in our geotechnical report and the project plans.

5. Compaction of the upper 6 inches of exterior flatwork subgrade to at least 90 percent relative compaction at a moisture content at least 1 percent above laboratory optimum moisture content, except for expansive clay soils which were to be compacted to between 87 to 92 percent relative compaction at a moisture content at least 3 percent over optimum.

6. Compaction of flatwork aggregate base to at least 90 percent relative compaction at a moisture content slightly above laboratory optimum moisture content.

7. Compaction of the upper 6 inches of pavement subgrade to at least 95 percent relative compaction at a moisture content at least 1 percent above laboratory optimum moisture content, except for expansive clay soils which were to be compacted to between 87 to 92 percent relative compaction at a moisture content at least 3 percent over optimum.

8. Compaction of pavement aggregate base to at least 90 percent relative compaction at a moisture content slightly above laboratory optimum moisture content.

Scope of Services

Our geotechnical observation and testing services began November 21, 2019 and included grading, keyways, subdrains, foundations, and retaining walls, and lasted until October 26, 2020, the date of our last requested site visit. The scope of our construction observation and testing services for geotechnical aspects of this project included a combination of part-time and full-time observation and testing on an on-call basis as set forth in our agreement with you. A general list of construction work involving our geotechnical engineering services is presented below.

1. Site clearing and demolition, including stripping of surface vegetation, designated trees and shrubs and associated roots, removal of foundations, slabs, and pavements, and abandoned utility lines.

2. Over-excavation and re-compaction of undocumented fill.

3. Keyway and bench excavation prior to fill placement.

4. Fill placement and compaction as well as compaction of scarified subgrade soils in those areas to receive fill or slabs-on-grade.

5. Installation of subdrains, including retaining wall drainage, and keyway and benching subdrains.

6. Installation of storm drain outfall structure.

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Date:	June 10, 2022
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Prepared For:	Mr. Jack Chamberlain and Mr. Noel Chamberlain **TICONDEROGA PARTNERS, LLC** 655 Skyway, Suite 230 San Carlos, California 94070
Re:	Geotechnical Observation and Testing Services Highland Estates Lot 10 2185 Cobblehill Place San Mateo, California

Introduction

In this letter we summarize the results of our geotechnical observation and testing services at the referenced development. We previously performed a geotechnical investigation for the development and presented the results in our October 30, 2015 report titled, "Updated Geotechnical Investigation Highland Estates Lots 5 through 11, San Mateo, California."

Project Description

Lot 10 is located at 2184 Cobblehill Place, San Mateo, California. The project consisted of construction of a split-level 2 story single family home supported on a drilled pier and grade beam foundation. The upper level has a finished floor at Elevation 501.5 feet and the lower-level finish floor is at Elevation 496 feet. Site work included keyway and benched fill, utilities, flatwork, landscaping, and other improvements necessary for site development.

Earthwork Recommendations

As referenced below, compaction tests were determined relative to the maximum dry density and optimum moisture content established by ASTM Test Designation D1557, latest edition. A general summary of the earthwork recommendations for the project from our October 30, 2015 report and the project plans and specifications is as follows:

1. Site clearing, including stripping of surface vegetation, designated trees and shrubs and associated roots, removal of pavements and abandoned utility lines.

2. Compacting fill as well as scarified surface soils in those areas to receive fill or slabs-on-grade to at least 90 percent relative compaction at a moisture content at least 1 percent above laboratory optimum moisture content, except for expansive clay soils which were to be compacted to between 87 to 92 percent relative compaction at a moisture content at least 3 percent over optimum. Fills greater than 5 feet in depth were to be compacted to at least 95 percent relative compaction for the portion of fill below the upper 5 feet.

3. Compaction of fill material for utility trench backfill to at least 90 percent relative compaction at a moisture content at least 1 percent above laboratory optimum moisture content, except for expansive clay soils which were to be compacted to between 87 to 92 percent relative compaction at a moisture content at least 3 percent over optimum.

4. Foundation excavation in accordance with the recommendations in our geotechnical report and the project plans.

5. Compaction of the upper 6 inches of exterior flatwork subgrade to at least 90 percent relative compaction at a moisture content at least 1 percent above laboratory optimum moisture content, except for expansive clay soils which were to be compacted to between 87 to 92 percent relative compaction at a moisture content at least 3 percent over optimum.

6. Compaction of flatwork aggregate base to at least 90 percent relative compaction at a moisture content slightly above laboratory optimum moisture content.

7. Compaction of the upper 6 inches of pavement subgrade to at least 95 percent relative compaction at a moisture content at least 1 percent above laboratory optimum moisture content, except for expansive clay soils which were to be compacted to between 87 to 92 percent relative compaction at a moisture content at least 3 percent over optimum.

8. Compaction of pavement aggregate base to at least 90 percent relative compaction at a moisture content slightly above laboratory optimum moisture content.

Scope of Services

Our geotechnical observation and testing services began November 21, 2019 and included grading, benches, subdrains, foundations, and retaining walls, and lasted until October 26, 2020, the date of our last requested site visit. The scope of our construction observation and testing services for geotechnical aspects of this project included a combination of part-time and full-time observation and testing on an on-call basis as set forth in our agreement with you. A general list of construction work involving our geotechnical engineering services is presented below.

1. Site clearing and demolition, including stripping of surface vegetation, designated trees and shrubs and associated roots, removal of foundations, slabs, and pavements, and abandoned utility lines.

2. Over-excavation and re-compaction of undocumented fill.

3. Bench excavation prior to fill placement.

4. Fill placement and compaction as well as compaction of scarified subgrade soils in those areas to receive fill or slabs-on-grade.

5. Installation of subdrains, including retaining wall drainage, and keyway and benching subdrains.

6. Drilled pier and grade beam foundation excavation.

7. Placement and compaction of retaining wall backfill.

8. Observation and testing of surficial soil on Lot 10 for expansive soil. The testing of the surficial soil indicates a Plasticity Index (PI) of 18.

9. Observation of vapor retarder system construction for garage/interior slab-on-grade, including a minimum of 8 inches of non-expansive fill (as recommended in our report) and placement of vapor retarder.

Services Performed

During construction, we provided geotechnical observation services along with periodic field density testing at various locations and elevations across the site. Our observations and field density test results were recorded in the Daily Field Reports (DFR), Nos. 1 through 58, for the period from November 21, 2019 through October 26, 2020. Laboratory testing consisted of six compaction curve tests and two Atterberg Limit (PI) tests. These tests were conducted for the various fill materials used at the site. Records of the field density tests and laboratory testing are kept in our files for a period of three years after completion of the project and are available for your review, if desired.

Meaning of "Observation"

"Observation", as used in this document, means that we observed the progress of the work on an intermittent basis, and performed tests on selected soil and rock materials. Our opinion about the general conformance of geotechnical aspects of construction to our recommendations and project plans and specifications is based on these observations and test results.

Opinion

Based on our field observations and test results, it is our opinion that the geotechnical aspects of the construction for the project that we observed and tested have been performed in general conformance with our recommendations and the project plans and specifications.

Closure

Our geotechnical services, including our professional opinions and conclusions, are made for the sole use of Ticonderoga Partners, LLC, in accordance with generally accepted soil and foundation engineering principles and practices in the San Francisco Bay Area at this time. However, we do not undertake the guarantee of any aspects of the construction that we observed and tested, nor do we relieve the contractor of his primary responsibility to produce a completed project conforming to the project plans and specifications. No warranties are either expressed or implied.

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Should you have any questions, or if we can be of further service, please contact us at your earliest convenience.

Sincerely,

Cornerstone Earth Group, Inc.

Danh T. Tran, P.E.
Senior Principal Engineer

DTT:ram

Copies: Addressee (1 by email)
County of San Mateo (1 by email)
Attn: Camile Leung

7. Drilled pier and grade beam foundation excavation.

8. Placement and compaction of retaining wall backfill.

9. Observation and testing of surficial soil on Lot 9 for expansive soil. The testing of the surficial soil indicates a Plasticity Index (PI) of 18.

10. Observation of vapor retarder system construction for garage/interior slab-on-grade, including a minimum of 8 inches of non-expansive fill (as recommended in our report) and placement of vapor retarder.

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Sincerely,

Cornerstone Earth Group, Inc.

Danh T. Tran, P.E.
Senior Principal Engineer

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County of San Mateo (1 by email)
Attn: Camile Leung