YES! YOUNG ENGINEERING SERVICES
GEOTECHNICAL CONSULTANTS
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June 18, 2020

Job 12641-19 JOB COPY

Miguel Escutia c/o
Alejandro Escutia, scatypk@gmail.com
3719 Paxton Place
Santa Rosa, CA 95404

Dear Mr. Escutia:

Consultation - Plan Review
Escutia Residence Rebuild
Lot 19, Royal Glen Subdivision
3719 Paxton Place
APN 173-460-019
GPS: Lat/Long N38.4844, W122.6911
Santa Rosa, CA

This letter presents the consultation that Young Engineering Services (***YES!***) has provided at your request in connection with the referenced property. Our plan review was for conformance with soil design criteria as indicated in our Soil Investigation Update dated March 26, 2018, together with current good practice per Chapter 18 and Appendix J (formerly Chapter 33 and Appendix 33) of the California Building Code (CBC). The architectural were prepared by Farrell•Faber & Associates and print-dated June 18, 2020; the structural plans were prepared by Johnson DeBois & Forrest and dated June 10, 2020.

It is our understanding that the plans developed use on this lot are custom, and differ from those previously approved for this lot as part of our April 13, 2018 review of the architectural master plans for the overall development. With exception of our consultation during final design update noted herein, all other criteria in our report of Soil Investigation Update dated March 26, 2018 remains valid for use with the planned improvements at this site. This planned development is consistent with the proposed site use when we prepared our Soil Investigation Update.

Site Conditions

A representative of this office reviewed the site and vicinity on May 28, 2019; our original review was on December 20, 2017, in the presence of Frank Schellinger, and we have been on site several times since that date. This lot is located on the west side of Paxton Place, about 110 feet south of its intersection with Yorkton Way, and is within the Royal Glen Subdivision also known as Fountaingrove II East - Unit 4. On the

basis our site reconnaissance, review of the geotechnical investigation prepared by others, and our knowledge of soil conditions in the area, we believe that the parcel is stable; overall slopes within the planned building envelope are about 5 percent west toward Fountaingrove Parkway; the surficial soil cover consisted of residual soil and was identified to have "very low to low (borderline medium) expansion potential" (tendency to undergo volume changes with changes in moisture content) per California Building Code (CBC) classification; and that is there is relatively limited soil cover overlying weathered bedrock; the bedrock is consistent with published mapping which indicates the site to be underlain by Pleistocene Age, Sonoma Volcanics. Large boulders were noted exposed at the ground surface in the immediate site vicinity within the planned building area prior to the original development. (Residual soil is derived in-place from weathering of bedrock.)

The previous development on site was razed due to damages resulting from the Tubbs NorthBay Firestorms of October 2017, and resulted in surficial disturbance of the near surface soils to depths of at least 12 to 18 inches, and an overall lowering of the site estimated on order of 1 to 2 feet due to offhaul of the foundations and near surface soils. The surface soils across the site are not especially susceptible to downhill creep (tendency for soils to migrate downslope during the seasonal shrink/swell cycles, due to the force of gravity) due to the low expansion potential of on site soils and gentle site slopes.

Consultation During Final Design

Our referenced report of Soil Investigation Update is directly applicable to this site. Due to recent changes in the California Building Code (CBC), we are updating the report to include the recent code provisions and/or changes in practice since publication of that report.

Based on the results of our investigation, which included use of the SEAOC/OSHPD Seismic Design Maps Tool and the SEAOC/OSHPD Seismic Design Maps Tool, in accordance with ASCE 7-16 and CBC Section 1613, we recommend that the following seismic design criteria be used in accordance with the provisions of the 2019 California Building Code (CBC):

GPS Site Location, Lat/Long	N38.4844, W122.6911
Seismic Occupancy Category	II
Site Class (Soil, per Table 20.3-1)	D
Spectral Response Accelerations, S_s	2.524
Spectral Response Accelerations, S_1	0.965
Maximum Earthquake Accelerations, S_{MS}	2.524
Maximum Earthquake Accelerations, S_{M1}	null, see §11.4.8
Spectral Response Coefficient, S_{DS}	1.683
Spectral Response Coefficient, S_{D1}	null, see §11.4.8
Peak Ground Acceleration, PGA	1.055

ASCE 7-16, Section 11.4.8 now requires that a ground motion hazard analysis be performed in accordance with Section 21.2 for structures on Site Class F, or Site Class D or E with S_1 greater than 0.2. However, in the absence of a site-specific ground motion analysis, alternative structural considerations may be as follows:

1. If the structure period (T) is less than 1.5* T_s, then calculate the seismic response coefficient (C_s) per ASCE 7-16, Eq12.8-2 as normal.
2. If the long period transition (T_L) is greater than the structure period (T), and the structure period is greater than 1.5*T_s than C_s is 1.5*Eq12.8-3.
3. If the structural period (T) is greater than T_L, then calculate the C_s as 1.5*Eq12.8-4

Plan Review

Our review of the plans was for conformance with the project guidelines as outlined above, together with typical good practice consistent with our knowledge of the site conditions. This site was subject to wildfire-related damage from the Tubbs NorthBay Firestorms of October 2017, which resulted in surficial disturbance of the near surface soils. The Escutia Residence rebuild is indicated to be two-story, with wood framed walls, and raised wood floors in living areas and a slab-on-grade porch and garage. The plans indicate the residence to have 2682 square feet (sf) of living area, a 508 sf Attached Garage and a 463 sf Covered Outdoor areas (Entry Porch and Loggia).

Our review was generally favorable, and consistent with our ongoing consultation. The following summarizes our review of the project plans consistent with our design guidelines:

1. Foundations. The foundation design conforms to our recommendations, incorporates our Soil Investigation Update dated March 26, 2018, by reference, and indicates the foundation excavations will be reviewed and approved by this office prior to pour.

   The minimum footing depth of Sheet S2 indicates 18 inches, for footings founded in engineered fill and/or weathered bedrock, with full removal of the weak and porous surface soils, including soils disturbed during razing of the former site improvements. The indicated spread footing (deepened footings poured "neat" or inverted-tee footing elements, with structurally separate slab-on-grade floors) are otherwise consistent with our recommendations.

   As an alternate in absence of engineered grading, the foundations can be supported on spread footing elements at depths of 24 inch minimum and at least 12 inches into the firm, intact soils below the depth of disturbance.

2. Drainage. All finished surfaces are indicated graded to drain away from the building envelope consistent with current CBC standards requires a drainage gradient five percent (or at least two percent on impervious surfaces and/or soils which have high erosion potential), achieved and maintained to at least 10 feet away from structures. Where physical obstructions or lot lines occur within the minimum clearance, drainage diversions (eg, interceptor swales) should have longitudinal slope a minimum of two percent.

Weep holes should be placed at six foot spacing through the stem wall of the interior cross slope footings, the lower sides of the slab-on-grade garage floor, and along the lower (perimeter) wall lines of the residence. (A perforated pipe embedded within the slab rock along the exterior perimeter of the garage could be used in lieu of weep holes in this sub-slab area.) Weep holes can consist of 2 inch PVC cut to fit within the foundation stem wall, and on the perimeter, with the ends wrapped in hardware cloth (one-quarter inch sieve openings) to minimize clogging, and prevent access from rodents.

The drainage for the wall backdrains should conform to the attached Retaining Wall Details. Where this drain is immediately adjacent to a slab-on-grade floor (i.e., the garage floor and master bedroom floor slabs), the flow line of the perforated collector pipe should be at least 8 inches below the finished surface of the slab and should be at least 8 inches above the bottom of the footing excavation.

Surface water may not flow into the underdrainage (wall backdrains); however, underdrainage may flow into the roof and surface water collectors.

An expedient and economical solution for this drainage envelope would be to use a composite synthetic drainage material (eg, Miradrain or equal), also discussed on the attached Retaining Wall Details. The composite drain system is well suited for footings poured "neat" (without forming, as indicated on the plans), and should be placed along the upslope wall of the footing excavation prior to footing pour. To relieve this drainage envelope, a perforated pipe and typical drainage envelope (drain rock wrapped in geotextile filter fabric, or perforated pipe wrapped in the composite fabric) should be in contact with the ends of the drain for a distance of at least 5 feet.

The collected roof runoff should be transmitted away from the structure in a closed conduit. The water should discharge onto site paving, at the curb, or into the storm drain system to inhibit ponding and the erosion potential of concentrated flow.

3. Slab-on-Grade Floors. The slab-on-grade floors are indicated to be 4 inches thick and utilize #3 rebar at 18 inches OC EW. Slabs are indicated poured structurally separate from foundations (be "floating") and have deep joints or expansion joints at centers of about 12 feet or less.

The sub-slab aggregate should be free-draining to provide a capillary break; this granular blanket should be graded in size between ¼ and 1½ inches. It would be preferable for this material to be a crushed product. Use of ¾ inch drain rock would provide an economical source of material to provide these characteristics.

Any remnant weak and disturbed surficial soils, will require recompaction or replacement within the area of planned slabs. A minimum 12 inch blanket of low expansive soils is recommended incorporated at slab subgrade under garage or porches which are not considered especially sensitive to slab cracking. Expansion should be checked at grade during construction, as such low expansive soils may be naturally present.

These materials should be replaced with low-expansive, engineered fill (compacted to at least 90 percent compaction per ASTM D1557), or be clean, coarse free-draining material (as discussed above). If such coarse, granular materials are used, they can be tamped, wheel rolled, or vibrated "tight".

A Vapor Retarder can be used to retard vapor transmission through floor slabs. The vapor retarder membrane should be placed between the base course and the slab. If a polyethylene (eg, Visqueen) or more durable butyl membrane is utilized, it should be covered by a protective 2 inch sand cap. If a Vapor Barrier (eg, Stego Wrap) is desired due to especially sensitive floor coverings, adhesives, coatings or building environments, it should be installed in accordance with the manufacturers recommendations. In either case, buildup of vapor pressure through diffusion will be minimized if the vapor membrane has a lower permeance than the floor covering system. It should be noted that American Concrete Institute (per ACI 302, Guide for Concrete Floor and Slab Construction) recommends that protective membranes be not less than 10 mils thick, or 15 mils when placement equipment drives directly on the membrane. Support for exterior flatwork may be placed directly on the subgrade which has been prepared in accordance with the recommendations contained above.

4. Site Grading. Site grading conforms to our Soil Investigation Update dated March 26, 2018. Site grading is indicated limited to preparation for the slab-on-grade

garage and porch slabs, and should conform to Chapter 18 and Appendix J of the California Building Code (CBC).

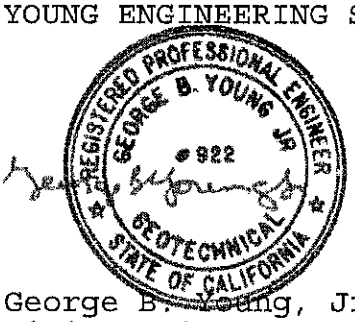
Additional Services

Our review of construction excavations is considered an integral part of our review for this development. Please call when either site grading or excavation for foundations and floor slabs has been scheduled so that we can coordinate with the contractor to provide the necessary reviews.

We have enjoyed this opportunity to be of service. Please do not hesitate to call if we can be of further assistance.

Very Truly Yours,

YOUNG ENGINEERING SERVICES



George B. Young, Jr.
Civil Engineer - 27405
Geotechnical Engineer - 922

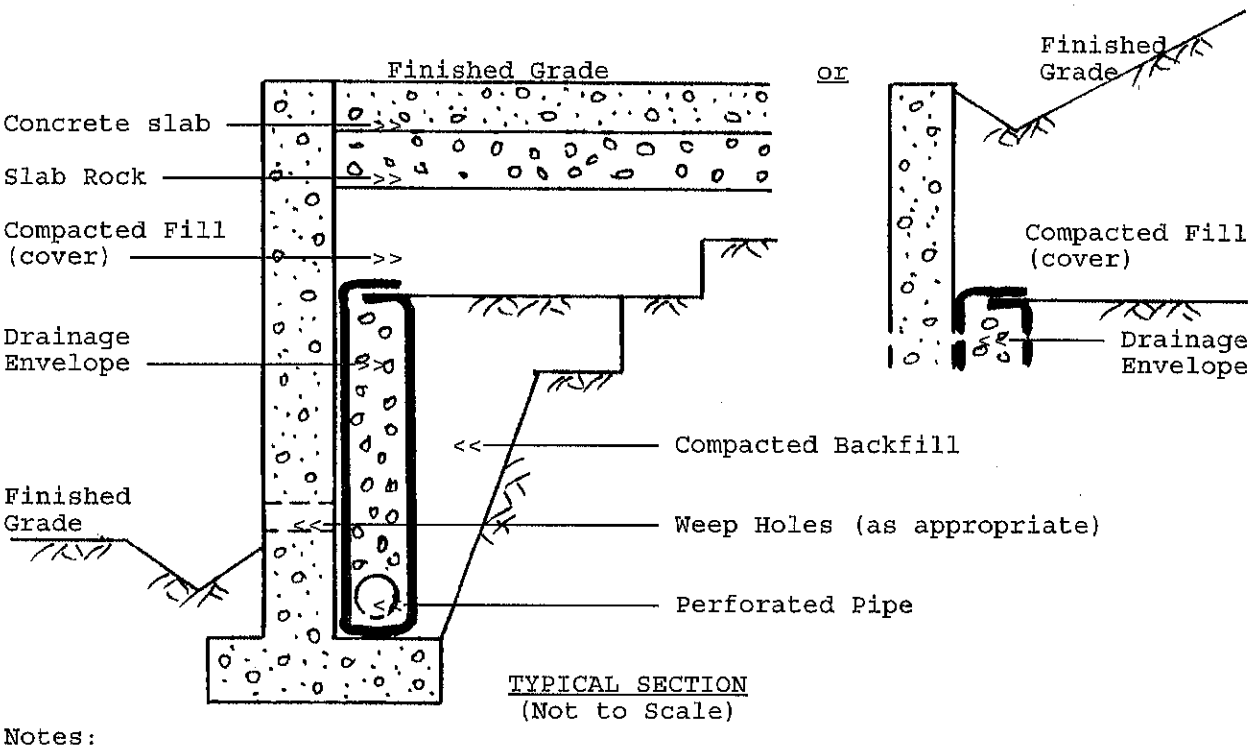
3 copies submitted
cc: Johnson DeBois & Forrest, Attn: Kelly Johnson
Farrell•Faber & Associates

Attachment: Plate 1 - Retaining Wall Details

8/8

YES! RETAINING WALL DETAILS

3719 Paxton Place, APN 173-460-019
Santa Rosa, CA



TYPICAL SECTION
(Not to Scale)

Notes:

1. Compacted Fill (cover). The drainage envelope should be capped by a compacted soil cover a minimum of 12 inches thick. This cover blanket may be omitted where the surface is paved.

2. Drainage Envelope. To minimize potential for clogging of retaining wall drainage, the drainage envelope should also be separated from the soil by use of a Geotextile Filter Fabric (Mirafi 140NP or equal).

   or utilize a select Permeable Material (per Section 68 of Caltrans Standard Specifications) for backfill.

   or utilize a Composite Geosynthetic Drainage System (Miradrain or equal). To relieve this drainage envelope, a perforated pipe and typical drainage envelope (drain rock wrapped in geotextile filter fabric, or perforated pipe wrapped in the composite fabric) should be in contact with the ends of the drain for a distance of at least 5 feet.

3. Perforated Pipe. The perforated pipe should conform to the requirements of Section 68 of Caltrans Standard Specifications, perforations placed down, sloped at least one percent to drain to a gravity outlet.

   or Weep Holes. Where water draining in front of the wall is acceptable, weep holes should be placed at six foot spacing. Weep holes can consist of 2 inch PVC cut to fit within the foundation stem wall, with the ends wrapped in hardware cloth (one-quarter inch sieve openings) to minimize clogging, and prevent access from rodents.

4. Compacted Backfill. The compacted backfill should be keyed and benched into the backslope. The width and location of benches are approximate, and will be determined in the field by a representative of ***YES!***.

5. Surface drainage is to be provided at the toe of the retaining wall.