



GEOTECHNICAL CONSULTANTS

July 22, 2018  
Job No. 3476.12

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Plan Review  
Geotechnical Engineering Services  
during Final Design  
33 Chelsea Drive  
Larkfield Estates Subdivision  
Santa Rosa, California

This letter transmits our comments regarding the following project plans:

1. Sheets S-GN, S-GD, S-1, S-2, & SD-1 through SD-3, dated July 1, 2018, prepared by Design Everest Consulting Engineers.
2. Sheet A1, dated July 2018, prepared by Townsend Residential Design.

We previously performed a geotechnical investigation for the project and transmitted the results in our January 19, 2018 report. We are performing this plan review as requested by you and in general accordance with the continuing services clause of our December 4, 2017 agreement.

We have reviewed the soil related portions of the referenced plans and find that the plans are in general conformance with the intent of our recommendations. However, we recommend that following comments be incorporated into the project plans:

- 1) Typical foundation details on Sheet SD-1 notes should indicate that: 1) foundations must extend at least 12 inches into firm materials below the weak soils; 2) where expansive soils are exposed in foundation excavations, the foundations must be at least 36 inches below lowest adjacent grade; and 3) where footings are deepened, the deepened

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foundation excavations can be backfill with unreinforced lean (2 sack) concrete to within 18 inches of lowest adjacent grade. This assumes that weak soils will not be excavated and replaced as engineered fill.

- 2) The Design Criteria on Sheet S-GN should reference our Geotechnical Investigation report dated January 19, 2018 for the project and require that all work conform to the report.
- 3) Grid foundations should be provided at 15 feet maximum on-center.
- 4) The slabs are connected to foundations. The slabs should be either: 1) separated from foundations with felt paper, mastic, or other positive and low friction separation; or 2) the weak should be excavated and recompacted for their full depth. Where slabs are separated, the slabs should be separated from foundations with felt paper, mastic, or other positive and low friction separation. Slab rock and subgrade preparation, per our report, should be specified under the garage slab.
- 5) Site drainage should be carefully installed to mitigate the risk of seepage and to improve site stability. The following comments are provided relative to this concern:
  - a) Notes indicate that underfloor areas will be sloped to drain and provided with outlets (Sheet A1). Where the underfloor areas are lower than exterior areas, there will be a risk of seepage into the lower areas, both from rainfall and landscape irrigation. Improved mitigation of this seepage risk can be provided by the installation of interior and perimeter foundations drains.
  - b) Roofs should be provided with gutters, and the downspouts connected to non-perforated pipes discharging in erosion resistant areas well away from the structures and slopes. Roof downspouts and surface drains must be maintained entirely separate from subsurface drainage.
  - c) Outlets should be provided in the slab rock to reduce the risk of water build up in the slab rock. Increased mitigation could be provided by installation of trench subdrains beneath the slab rock if desired.

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As a reminder, it should be expected that the garage and exterior slabs-on-grade will experience differential movements. If better slab performance is required or desired, it will be necessary to overexcavate portions of the weak and expansive soils (if encountered) and replace these with suitable non-expansive fill. We can provide specific recommendations for improved slab performance, as requested.

Providing grading recommendations for the new driveway areas were not part of our investigation scope of work. If desired, we would be pleased to provide supplemental consultation regarding the driveway.

We should observe the start of foundation excavations to note the conditions exposed and provide recommendations to the contractor. We should observe the completed excavations prior to the placement of reinforcing steel and concrete. We will observe the geotechnical and special inspection related items on an "on-call" basis. We can not comment on the adequacy of items we are not contacted to observe. We must be provided with at least 48 hours notice for scheduling our initial site visit, and 24 hours thereafter.

We trust this provides the information you require at this time. If you have questions or wish to discuss this further, please call.

Very truly yours,

**BAUER ASSOCIATES, INC.**

*Bryce Bauer*

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Geotechnical Engineer



BB (pr/les mohr)  
Email only