YES! **YOUNG ENGINEERING SERVICES**
GEOTECHNICAL CONSULTANTS
132 Boas Drive • Santa Rosa, CA 95409-3611 • (707) 538-7503 • (FAX) 539-6227
e-mail gyoung@sonic.net

Reviewed for Code Compliance
County of Sonoma
PRMD
Resiliency Permit Center
5/10/21

March 29, 2021

Job 112801

THESE ATTACHMENTS ARE PART OF THE APPROVED PLANS
***DO NOT REMOVE THEM ***
5/10/21
PRMD
RESILIENCY PERMIT CENTER

PERMIT #
BLD21-2253

Katherine Anderson c/o
Tom Lynch Construction
PO Box 1452
Guerneville, CA 95446

Dear Mrs. Anderson:

Soil Investigation Update
Anderson Residence Rebuild
Lot 7, Larkfield Estates #11
242 Dover Court North
APN 058-221-007
GPS: Lat/Long N38.5000, W122.7429
Sonoma County, CA

This letter presents the consultation that Young Engineering Services (***YES!***) has provided at your request in connection with the referenced property, and is intended to summarize geotechnical design parameters for use at this site.

It is our understanding that our reconnaissance and review are to visually assess any wildfire-related damage from the Tubbs NorthBay Firestorm of October 2017, subsequent to your previous site development and the prior geotechnical study performed for this site by others; review of any existing file data; review of published data relating to geotechnical hazards; and provide geotechnical conclusions and recommendations regarding the suitability of the site for the intended development, and recommendations consistent with current good practice, and recent geotechnical provisions of the California Building Code (CBC), including Chapter 18 and Appendix J, and Chapter 11 and 11A of the Sonoma County Code (Ordinance 5819).

A representative of this office reviewed the site and vicinity on March 19, 2021, in the presence of Jeff Faulkner of FBI Construction. In addition to our reconnaissance, we reviewed data in our files which included: topography and aerial photography mapping data obtained from the Sonoma County PRMD, interactive GIS mapping database; the Sonoma County Parcel Maps; the California Division of Mines and Geology (CDMG) Special Report 120, entitled Geology for Planning in Sonoma County, dated 1980; the CDMG Regional Geologic Map of Santa Rosa, dated 1982; the CGS Landslide Inventory & Deep Landslide Susceptibility Map,

Reviewed for Code Compliance

BLD21-2253

dated 2015; the California Geological Survey (CGS) Geologic Map of California interactive mapping database; the CGS Special Studies Zone (Alquist-Priolo, Earthquake Zones of Required Investigation) interactive mapping database; the California Geological Survey (CGS) Fault Activity Map of California, interactive mapping database; the Geologic and Geophysical Framework of the Santa Rosa 7.5' Quadrangle, Sonoma County, CA, dated 2008 by RJ McLaughlin etal, USGS Open-File Report 2008-1009; Liquefaction Susceptibility Map, San Francisco Bay region, by RC Witter etal, USGS Open-File Reports 000-444 and 2006-1037, dated 2005 and 2006, respectively; and the SEAOC/OSHPD Seismic Design Maps Tool and the SEAOC/OSHPD Seismic Design Maps Tool, in accordance with ASCE 7-16.

The site is located on the south side of Dover Court North, about 30 feet west of the Dover Court North cul-de-sac, located on north from its intersection with Lambert Drive, in the Larkfield Estates Subdivision, in the Larkfield area of Sonoma County. On the basis of our site reconnaissance, review of the Soil Investigation dated June 15, 1985, prepared by Giblin Associates developed for the Mark West Estates located immediately north, and our knowledge of soil conditions in the area, it is our opinion that the parcel is stable; the surficial soil cover was identified to have "low expansion potential" (tendency to undergo volume changes with changes in moisture content) per California Building Code (CBC) classification; the site is underlain by alluvium (dominately gravelly silt and clay, interlayered with gravel lenses) to substantial depth, which became stiff below two feet; the building envelope is relatively planar, without defined drainage, and is about 1½ feet lower than the street frontage on Dover Court North. The overall drainage in the vicinity is about one half percent, toward Mark West Creek about 1050 feet on the north. The previous development on site was razed due to damages resulting from the October 2017 wildfire, 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 on order of one foot due to offhaul of the foundations and near surface soils.

Discussion - Conclusions

The main geotechnical considerations pertinent to the development of this lot are the depth of soils disturbance from razing of former site improvements and presence of remnant foundation artifacts associated with the former improvements; surface drainage characteristics; the thickness of surficially weak and compressible soils under structure loads (particularly when saturated); and susceptibility to liquefaction.

The planned building envelope can be developed with considerations typical for most single family residential parcels within Sonoma County. In accordance with the SR120 publication, the site is within an area which is considered A-"...areas of greatest relative stability due to low slope inclination,

Reviewed for Code Compliance

BLD21-2253

dominately less than 15%". Published mapping in the area indicates the area is free of landslides on or near the site. In accordance with the CGS Landslide Inventory Susceptibility Mapping, the closest active landslide is located about a half mile to the east.

Control of site drainage will require careful consideration in design so that runoff discharges onto site paving, into the roadside drainage ditch, at the curb, or into a storm drain system, or on slope to inhibit ponding and the erosion potential of concentrated flow, and equally important that discharge is not redirected onto an adjacent lot that is not being restored at this time.

There are no known active faults within the immediate site vicinity; the site is not within an Alquist-Priolo Special Studies Zone relating to fault hazard potential. The closest active faults are the Healdsburg-Rodgers Creek Fault, located approximately ½ miles to the northeast (and is 490 feet outside the associated Alquist-Priolo Special Studies Zone relating to fault hazard potential), the San Andreas Fault, located approximately 19½ miles to the southwest, the southerly terminus of the Alexander-Redwood Hill Fault located approximately 2½ miles to the north-northeast, and the southerly terminus of the Maacama Fault located approximately 6 miles to the northeast. The northerly terminus of the potentially active (Quaternary displacement, or movement within the last two million years) the West Napa Fault Zone is about 31 miles to the southeast.

The site will be subjected to strong ground shaking during future, nearby, large magnitude earthquakes. Generally, structures founded in firm soil can be expected to be subjected to short period, jarring motions, with little or no ground wave amplification. Wood-framed structures founded in firm soil, and designed in accordance with current earthquake resistant building codes (CBC), are well suited to resist the effects of strong ground shaking. The site is indicated to have "moderate" potential for liquefaction per USGS Liquefaction Susceptibility Mapping. However, our review of both test borings and construction of residential development within the immediate vicinity of this site indicates persistent stiff subgrade soils with an absence of lenses or significant pockets of fine grained soil, and low potential for liquefaction (loss of axial strength), lurching (lateral spreading), and differential settlement (rapid compression) potential under strong shaking can be identified on the basis of grain size distribution (loose silty fine to medium sand), low cohesive strength (soil fines are predominately silt and not clay), soil consistency/relative density, and depth to free groundwater. No additional geologic or engineering geologic studies appear warranted.

Recommendations

The following is based on our site reconnaissance, our

Reviewed for Code Compliance

BLD21-2253

knowledge of soil conditions in the area, and supplemented with California Building Code (CBC) minimums in design. Our recommendations are contingent upon an opportunity for our review of final grading and building plans (and soil-related specification), and construction period observations. These reviews would allow us to verify conformance of the work to project guidelines, determine that the soil conditions are as anticipated, and to modify our recommendations, if necessary.

In general, the site is stable, and support can be achieved on firm soils which underlie this site and/or engineered fill founded on such soils. As discussed above, the major geotechnical consideration are surficial soils that are weak or disrupted from razing of former site improvements, potentially expansive site soils, site drainage and foundation backdrainage. These concerns are discussed in more detail as follows.

Site Grading. With the exception of preparation for any lower floor slabs, presence of old tree root basins, or abandoning of former on-site septic systems, there appears to be no significant reason for mass grading at the site, and the following is intended to summarize a few key points. Depth of soils disturbance from razing of former site improvements can be largely accommodated by the careful consideration of the depth and type of foundations selected for use at this site, and limiting use of slab-on-grade floors.

Site grading should conform to Chapter 18 and Appendix J of the California Building Code (CBC), and Chapter 11 and 11A of the Sonoma County Code (Ordinance 5819). The site should be cleared of any rubbish, debris, and organic materials. These materials should be removed, and disposed of off the site. Where trees have been removed to make room for planned structures, deeper excavation will be required to remove heavier concentrations of roots. For fill to support structure foundations, the weak or disturbed surficial and/or old fill soils should be removed to full depth and replaced with engineered fill. All fill material should be free of any debris, organic matter, and oversize (four inch or larger dimension) rocks, and should be approved by a representative of ***YES!*** before it is placed. The existing on-site soils in a "cleaned condition" (eg, less any debris or organic matter) are considered satisfactory for reuse as engineered fill. Imported fill should be of relatively low expansion potential (Expansion Index less than about 30). All fill should be placed to at least 90 percent relative compaction per ASTM D1557.

Finished Grading. All finished surfaces should be graded to drain away from the building envelopes. Surface drainage should be consistent with current CBC standards which requires a drainage gradient of 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

Reviewed for Code Compliance

BLD21-2253

within the minimum clearance, drainage diversions (eg, interceptor swales) should have slope a minimum of two percent.

All concentrated flows, such as from roof downspouts or surface water runoff, should be collected in a conduit, berm, or lined channel, and discharge away from the structure so that they will not pond or erode materials contributing to structure support. The water should be disposed of on site paving, at the curb, into a storm drain system, or on-slope through an energy dissipater (eg, a "bubble" box or an apron of Rock Slope Protection, RSP) to inhibit ponding and the erosion potential of concentrated flow.

Subgrade soils should be finished true to line and grade to present a smooth, firm, unyielding surface, and should be maintained moist and free of shrinkage cracks until covered by permanent construction.

Seismicity. 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	N38.5000, W122.7429
Seismic Occupancy Category	II
Site Class (Soil, per Table 20.3-1)	D
Spectral Response Accelerations, S_s	2.176
Spectral Response Accelerations, S_1	0.838
Maximum Earthquake Accelerations, S_{MS}	2.176
Maximum Earthquake Accelerations, S_{M1}	null, see §11.4.8
Spectral Response Coefficient, S_{DS}	1.451
Spectral Response Coefficient, S_{D1}	null, see §11.4.8
Peak Ground Acceleration, PGA	0.914

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

Footings. Foundation support for the planned manufactured

Reviewed for Code Compliance

BLD21-2253

home(s) can be established on conventional spread footings, providing that such footings penetrate through any remnant weak or disturbed native or old fill and bottom with the underlying stiff alluvium and/or engineered fill founded on such soils. The footing elements should penetrate at least 24 inches below the existing ground surface and be stepped as necessary to achieve at least 12 inches of penetration through any remnant weak or disturbed native or old fill soil. Wall and column footings should be no less than 12 and 18 inches wide, respectively, regardless of load; the perimeter and mating line footings should be continuous (preferably along the mating line, or alternately with interconnecting grade beams between adjacent supports across the mating line), while the remainder of interior elements, either isolated or continuous.

In the absence of a current site specific subsurface investigation, footings so established should be restricted to California Building Code (CBC) minimums of 1500 pounds per square foot (psf) for dead plus live loads, with a one-third increase allowable for wind and/or seismic forces. Affirmation of penetration through the weak soil cover should be confirmed during construction by a representative of ***YES!*** prior to pour.

Penetration to less this minimum may be acceptable where excavations encounter remnant concrete foundation artifacts. Footings at such locations may be dowelled. Dowels should penetrate 7 inches into concrete. We would expect one dowel per isolated location (for long segments, maximum 24 inches on-center). Dowels should be at least equal to a Number 4 rebar, and should be secured using an "epoxy" backfill (Simpson SET-XP, Hilti HIT-RE-500-SD, Powers AC100 Gold, or equal.

Foundation support can be achieved on drilled piers or conventional spread footings, providing that such footings penetrate through the weak and disturbed surficial soil. Estimated soil design criteria are not presented here, due to the potential for encounter of remnant foundation artifacts and substantial variations which occur with subtle changes in soil conditions.

Retaining Walls. An appropriate Equivalent Fluid Pressure (EFP) for use in design of such walls would be 40 pounds per cubic foot (pcf) is anticipated for active earth pressure, assuming fully drained walls utilizing select low expansive soils for backfill, and a level backslope. As active earth pressure assumes that relative movement will occur between the wall and the backfill, backfill should be completed prior to completion of the framing tie-in. If walls are "fixed", or unable to rotate, they should be designed for a higher at-rest value of 60 pcf EFP. Use of other than select, low expansive soil as backfill would require an increase in these lateral design pressures.

The retaining wall backdrain should be prevented from

Reviewed for Code Compliance

BLD21-2253

clogging. This may be most readily accomplished by separating the aggregate backfill from the adjacent soil by incorporation of a geotextile filter fabric (Mirafi 140 or equal). Refer to the Retaining Wall Details attached for more detailed information.

If retaining walls are to be designed to withstand dynamic earthquake (or seismic) loading, a lateral load equal to 18.4 H^2 (or 18.4 times the square of the height of the retained soil) should be applied at two-thirds of the wall height. (P_E = $\frac{3}{8}K_hK_a\gamma H^2$; where P_E is the Pseudostatic horizontal force, K_h is the seismic coefficient (maximum considered ground acceleration) divided by the acceleration of gravity, K_a is the active earth pressure coefficient, γ is the unit weight of soil, and H is the height of the retaining wall.)

Lateral Resistance. Resistance to lateral loads can be obtained using a combination of passive earth pressure against the base of foundations and frictional resistance against the face of footing elements. An allowable passive earth pressure (for penetration into the firm native) of 250 pcf (triangular distribution), and frictional resistance of 0.25 times the net vertical dead load (to 500 psf maximum), can be used in design. Passive pressure should be neglected within 12 inches of pad grade, unless the surface is confined by slabs or pavement. The weak or disturbed native or old fill soil shall be discounted and not be considered a part of this confinement.

Site Drainage. All finished surfaces should be graded to drain away from the building envelopes. A surface drainage gradient 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.

Drainage considerations will include control of surface water runoff, and seepage under the structure. A wall backdrain will be required on the upslope side of the residence, and adjacent any slab-on-grade floors. 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. In lieu of this treatment, a typical 4 foot

Reviewed for Code Compliance

BLD21-2253

deep underdrain will be necessary upslope. Refer to the Subdrain Details attached for more detailed information.

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

Where the underfloor subgrade is significantly depressed (eg, typically 12 inches or more) below the finished exterior grade, the surface drainage gradient is to be increased to about 8.3% or one foot vertical to 12 feet horizontal (1V:12H).

Optionally, installation of underfloor "rat-proofing" could be utilized to prevent ponding in the underfloor area and complete the stabilization of the subgrade moisture conditions and minimize the expansion potential of the subgrade soils. This treatment should consist of a 6 mil polyethylene (Visqueen) moisture barrier laid on the ground surface and covered with a protective layer of lean concrete or grout. The seams should overlap 6 inches, and edges of the vapor retarder should extend at least 6 inches up interior posts and stem walls and be sealed or taped.

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

Slabs-on-Grade. Slab-on-grade floors are not recommended without reprocessing for uniformity of support. Due to the poor support characteristics of the weak and disturbed surficial soils, preparation for floor slabs will require recompaction or replacement of the any remnant weak or disturbed native or old fill soil within the area of planned slabs.

Due to the presence of potentially expansive soils, a minimum 18 inch blanket of low expansive soils is recommended incorporated at slab subgrade in living areas, or at least 12 inches under garage or porches which are not considered especially sensitive to slab cracking. In addition, any fill placed within 24 inches of slab subgrade (includes typical slab

Reviewed for Code Compliance

BLD21-2253

rock) should be of similarly low expansive soil. The requirements of this fill blanket should be reviewed by ***YES!*** if design considerations relative to structure service, grade changes, or structure type differ from that discussed herein.

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). The sub-slab aggregate (slab rock) 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. If such coarse, granular materials are used, they can be tamped, wheel rolled, or vibrated "tight".

Slabs should be poured structurally separate from foundations (be "floating") and have deep joints or expansion joints at centers of about 12 feet or less. To reduce the potential for slab cracking due to post construction subslab soil volume changes, native site soils within 18 inches of subgrade should be moisture conditioned immediately prior to pour. This may be accomplished through ponding, after slab rock and footing elements are in place. This moisture conditioning should be affirmed by a representative of ***YES!*** prior to pour.

A Vapor Retarder should 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.

Asphalt Paved Areas. Where fills are necessary within paved areas, they should conform to the previous fill quality recommendations noted above under Site Grading, and be compacted to at least 90 percent relative compaction, with 95 percent relative compaction achieved at pavement subgrade. Prior to subgrade preparation, utility trench backfills should be placed and compacted in accordance with the governing specifications. The upper six inches of subgrade soils should then be moisture

Reviewed for Code Compliance

BLD21-2253

conditioned to near optimum moisture content, and be compacted to at least 95 percent relative compaction. Finished subgrade surfaces should be maintained moist and free of shrinkage cracks until covered by permanent construction.

Aggregate Base, and Subbase if used, should conform to the requirements of the State of California "Caltrans" Standard Specifications, latest edition. Aggregate base courses should be placed in thin lifts in a manner to prevent segregation, moisture conditioned as necessary, and compacted to at least 95 percent relative compaction to provide a smooth, unyielding surface.

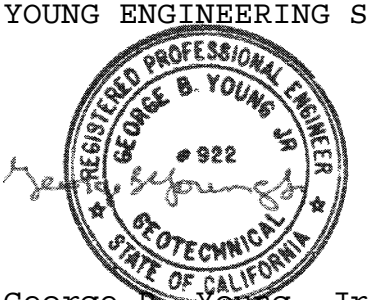
Additional Considerations

Prior to construction, we should review the final grading and building plans (and soil-related specification) for conformance with the intent of our recommendations. Our review of construction excavations is considered an integral part of our review for this residence. Please call when the excavation has been scheduled so that we can coordinate with the contractor to provide the necessary reviews. Our construction period observations would allow us to verify conformance of the work to project guidelines, determine that the soil conditions are as anticipated, and to modify our recommendations, if necessary.

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: Whitehorse, Attn: Russell Sherman
Framing Building & Improvements, Attn: Jeff Faulkner
Dirt Dudes Excavating, Attn: Brad Slender

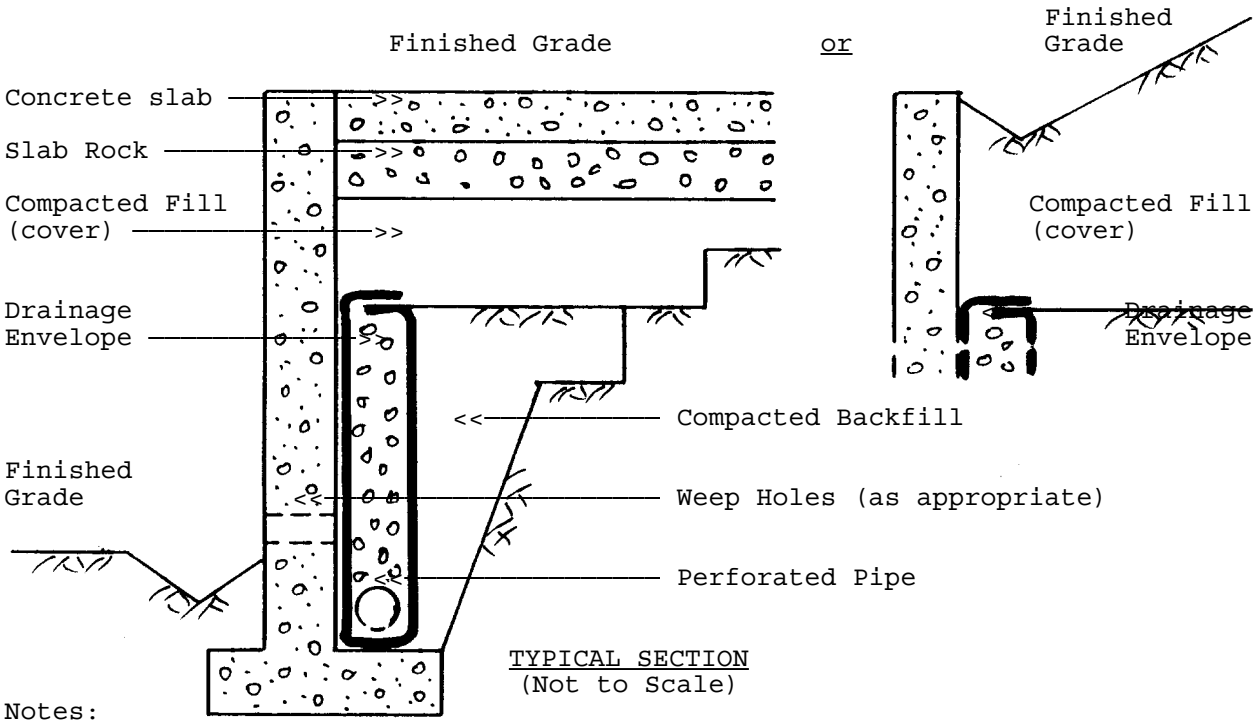
Attachments: Plate 1 - Retaining Wall Details
Plate 2 - Subdrain Details

Reviewed for Code Compliance

BLD21-2253

YES! RETAINING WALL DETAILS

242 Dover Court North, APN 058-221-007
Sonoma County, 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!***.

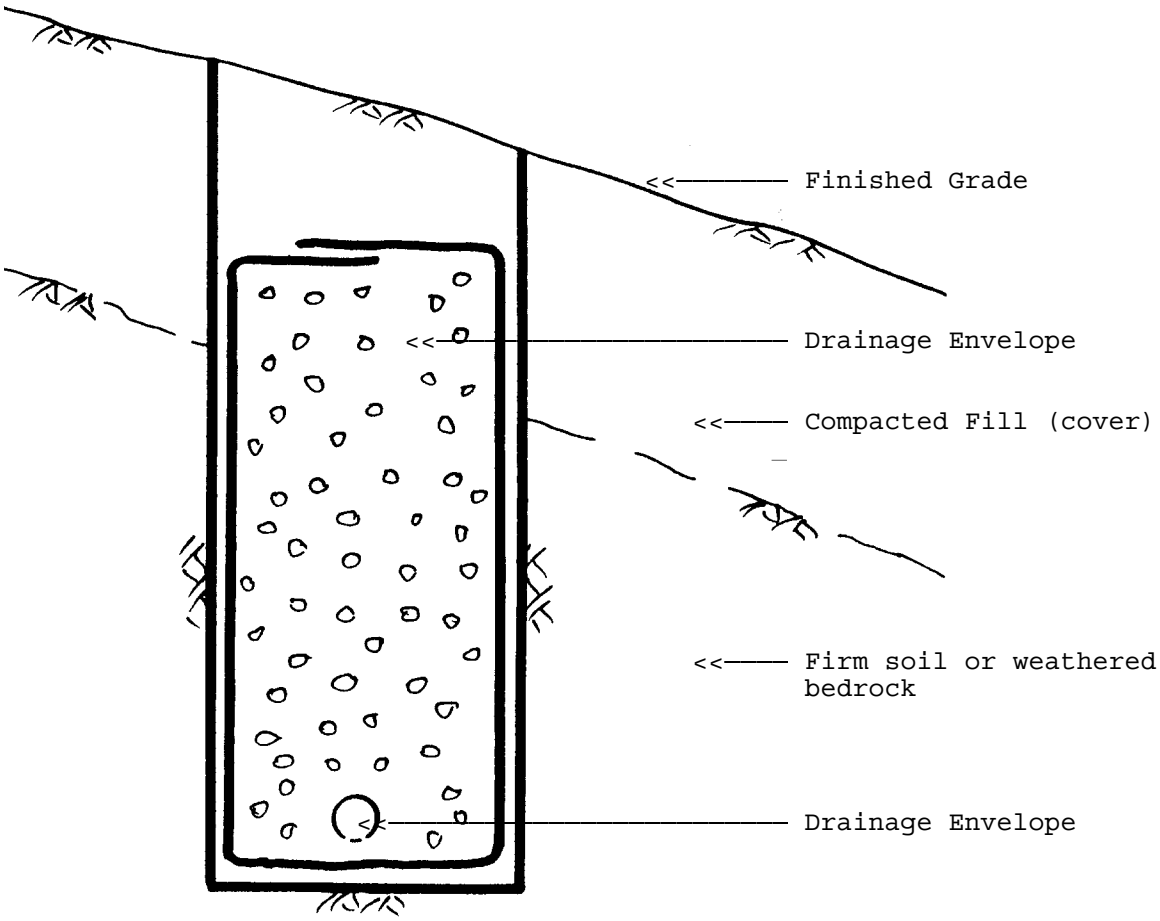
5. Surface drainage is to be provided at the toe of the retaining wall.

Reviewed for Code Compliance

BLD21-2253

YES! SUBDRAIN DETAILS

242 Dover Court North, APN 058-221-007
Sonoma County, 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. Unless otherwise approved by ***YES!***, the subdrain should be at least 4 feet deep and 1 foot into the firm soil or weathered bedrock, and be of minimum width 12 inches. To minimize potential for clogging of the subdrain, 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.

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.

Reviewed for Code Compliance