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MEMORANDUM

DATE: JANUARY 27, 2021

TO: COASTAL PERMIT ADMINISTRATOR

FROM: JULIA KROG, ASSISTANT DIRECTOR

SUBJECT: CDPM_2020-0002 (SCHAFFER) – MODIFICATION TO STAFF REPORT, CONDITIONS, AND ADDITION OF GEOTECHNICAL REPORT AS PART OF THE RECORD

After distribution of the staff report for the subject CDP Modification, Staff and the Agent consulted with the California Coastal Commission regarding the proposed Offer to Dedicate and any concerns they had regarding the project. The Commission staff expressed two concerns with regard to the proposed Offer to Dedicate, including the width of the proposed easement along the bluff and the requirement for fencing.

A question had arisen as to how the bluff setback was determined that was mentioned within Condition 35 and it was discovered that the prepared Geotechnical Investigation that supported this bluff setback, which was prepared for the building permit for the residence, was not yet part of the public record. Attached to this memorandum is the Geotechnical Investigation prepared by Brunsing Associates, Inc. dated September 20, 2019. This Geotechnical Investigation is hereby made part of the record for this project and supports the bluff setback.

Based upon the discussion with the California Coastal Commission, revisions are necessary to the Project Description and Condition 35. These changes are shown in strikethrough and underline.

Revised Project Description (Page 1):

Coastal Development Permit Modification of CDP_2018-0018, which authorized the construction of a 5,164 square foot single family residence, a 3,293 square foot porch/deck, an attached 612 square foot garage, an attached 2,034 square foot private art gallery, and 419 square foot detached workshop. In addition, a 1,000 square foot family care unit with 1,299 square feet of porch/decking, an 822 square foot chicken coop/run, a 44 square foot personal observatory, 40,400 square feet of ground mounted detached solar panels and two 144 square foot pump houses were authorized as well as ancillary improvements such as replacement fencing and temporary construction support consisting of temporary occupancy of a travel trailer during construction.

The Modification proposes an Offer to Dedicate (OTD) a pedestrian public access easement along the southerly property line, from southwestern corner of the property to the southeastern corner of the property as follows: a vertical OTD easement width of 10' as measured from the southern property line; and a lateral OTD easement of ~~35'~~ <u>50'</u> as measured from the bluff edge, which ~~considers a 12' bluff retreat~~<u>accounts for approximately 25' of bluff retreat</u> over the anticipated 75-year lifespan of the project <u>(Note: 25' is approximately double the potential bluff retreat determined in the Geotechnical Investigation dated September 20, 2019)</u>.

Revised Condition 35 (Page 17):

35. Prior to issuance of the Coastal Development Permit, the landowner shall execute a record an 'irrevocable offer to dedicate' against the property in a form and consent deemed acceptable to the Director of Mendocino County Planning & Building Services and the California Coastal Commission.

The Offer to Dedicate shall be as follows: a pedestrian public access easement along the southerly property line, from southwestern corner of the property to the southeastern corner of the property as follows: a vertical OTD easement width of 10' as measured from the southern property line; and a lateral OTD easement of ~~35'~~ <u>50'</u> as measured from the bluff edge, which considers a ~~12'~~ <u>25'</u> bluff retreat over the anticipated 75-year lifespan of the project (Note: 25' is approximately double the potential bluff retreat determined in the Geotechnical Investigation dated September 20, 2019).

The recorded document shall provide that the offer of dedication shall not be used or construed to allow anyone, prior to the acceptance of the offer, to interfere with any rights of public access acquired through use which may exist on the offered portion of the property;

The offer to dedicate shall include legal descriptions of both the entire project site and the area of dedication.

The offer to dedicate shall be recorded free of prior liens and any other encumbrances which the Director of Mendocino County Planning & Building Services and/or the California Coastal Commission determines may affect the interest being conveyed.

The offer to dedicate shall run with the land in favor of the People of the State of California, binding all successors and assignees, and shall be irrevocable for a period of 21 years, such period running from the date of recording.

The offer to dedicate shall require that any future development that is proposed to be located either in whole or in part within the areas described in the recorded offer to dedicate shall require a Coastal Development Permit, approved pursuant to the provisions of Mendocino County Coastal Zoning Code Chapter 20.536.

The offer to dedicate shall be submitted for the review and approval of the Director of Mendocino County Planning & Building Services and the Executive Director of the California Coastal Commission prior to the recordation and prior to the issuance of the Coastal Development Permit.

The offer to dedicate shall require that upon the opening of the vertical and lateral access easement for public use, an acknowledgement sign or monument will be erected on the property by the accepting public entity or private association, in a visible location, which shall provide that the applicant has dedicated the specified portion of the subject property for public use.

The offer to dedicate shall require that upon the opening of the vertical and lateral access easement for public use, an exclusionary fence (such as the existing perimeter fencing on the property, post and wire fencing, etc.) of a form acceptable to the property owner and accepting public entity shall be erected by the accepting public entity or private association, to prevent the public from trespassing onto the non-dedicated portion of the property.

The offer to dedicate shall require that the accessway shall not be opened for public use until a Coastal Development Permit has been granted for the passive recreational use and an Accessway Management Plan has been prepared by the managing agency and accepted by the Director of Mendocino County Planning & Building Services in conformance with Mendocino County Code section 20.528.045.

ADDITIONAL CORRECTIONS/CLARIFICATIONS TO STAFF REPORT:

Proposed Family Care Unit, Correction of Reference to it as Guest Cottage: The Coastal Commission Appeal filed for CDP_2018-0018 expressed concerns about adequacy of water for the proposed Family Care Unit. The applicant therefore proposed to modify their proposal to be a Guest Cottage with attached storage in lieu of the Family Care Unit as part of this modification request. However, after initial submittal of the modification request, a proof of water test was completed which found sufficient water to support the proposed Family Care Unit (see Groundwater Resources on Page 9). Since sufficient water was found to support the originally proposed Family Care Unit under CDP_2018-0018, the modification request was revised to include solely the proposed Offer to Dedicate and otherwise maintained the original project request that was approved under CDP_2018-0018 which included the Family Care Unit.

Staff had begun the Staff Report prior to the submittal of the revised project request by the applicant and inadvertently left the previous applicant statement in the Staff Report (Page 2) which states that a Guest Cottage and attached storage are proposed. In addition, Staff referred to the Family Care Unit as a Guest Cottage mistakenly in the Site Characteristics (Page 4), the Zoning consistency analysis (Page 5), Hazards Management (Page 8), Grading, Erosion and Run-off (Page 9), and Findings (Page 11).

The project request and description on Pages 1 and 2 of the Staff Report are accurate and proper notice of the correct project description was provided to the public.

Habitats/Natural Resources (Page 7, Paragraph 5): One sentence refers to the sensitive resource on the site as Bishop Pine Forest; however, it is Shore Pine Forest as is noted elsewhere within the Habitats/Natural Resources section.

Alignment of Condition Timing: Staff recommends that the Coastal Permit Administrator modify the timing of the deed restriction required by **Condition 33** (Page 16) to align with the timing of the deed restriction required by **Condition 8** (Page 12). This will be more practical and allow the applicant to file one deed restriction for both Conditions.

Corrected Exhibits: After distribution of the Staff Report, the Agent for the project noticed several inconsistencies in the Site Plan provided in the Staff Report (Attachments D and E of the Staff Report). These inconsistencies included the Guest Cottage label where it is meant to read Family Care Unit and the correct road approach as was approved under CDP_2018-0018 and MS_2018-0004.

The Floorplans and Elevations for the proposed project on all structures has not changed from the originally approved project, CDP_2018-0018. The wrong exhibits were attached to this staff report and therefore corrected Attachments D through E are attached to this memorandum.

ATTACHMENTS:

A. Geotechnical Investigation prepared by Brunsing Associates, Inc. dated September 20, 2019.
B. Corrected Attachments D and E

Attachment A to Memorandum

GEOTECHNICAL INVESTIGATION

PROPOSED SCHAFFER RESIDENCE,
FAMILY CARE UNIT AND DRIVEWAY
3890 NORTH HIGHWAY 1
ALBION, CALIFORNIA

Project Number 12613.03

September 20, 2019

Brunsing Associates, Inc.

GEOTECHNICAL INVESTIGATION

PROPOSED SCHAFFER RESIDENCE, FAMILY CARE UNIT AND DRIVEWAY 3890 NORTH HIGHWAY 1 ALBION, CALIFORNIA

Project Number – 12613.03

prepared for

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September 20, 2019

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1.0 INTRODUCTION

This report presents the results of our geotechnical investigation that Brunsing Associates, Inc. (BAI) has performed for the planned Schaffer Residence, Family Care Unit (FCU) and driveway at 3890 North Highway 1 in Albion, Mendocino County, California. The site location is shown on the Vicinity Map, Plate 1.

The proposed project is shown on the Site Plan, dated July 5, 2019, prepared by Schlosser, Newberger Architects. The plan shows a new single family residence, FCU, parking lots and driveways. The FCU is located to the west of the single family residence, northeast of the primary and replacement leach fields. The Site Plan is the base map used for our Site Geologic Map, Plate 2.

The purpose of our investigation was to evaluate the site soil and bedrock conditions in order to provide conclusions and recommendations regarding site grading, support of concrete slabs-on-grade, structure foundation support, and a limited geologic hazard assessment. Our approach to providing the geotechnical guidelines for the design of the project utilized our knowledge of the soil, bedrock and geologic conditions in the site vicinity and experience with similar projects. Field exploration for this investigation was directed toward confirming anticipated soil, bedrock and geologic conditions, in order to provide the basis for our conclusions and recommendations. As outlined in our Change/Extra Service Order, dated January 3, 2019, our scope of services for the geotechnical investigation included subsurface exploration, laboratory testing and engineering and geologic analyses, in order to provide conclusions and recommendations regarding:

- Geologic hazards;
- Site grading and drainage;
- Suitable foundation type(s) with design criteria and estimated settlement behavior;
- Seismic design criteria per California Building Code;
- Support of concrete slabs-on-grade;
- Lateral earth pressures and drainage requirements for retaining and/or subsurface walls;
- Anticipated geotechnical construction problems, if appropriate;
- The need for additional geotechnical services as appropriate.

2.0 INVESTIGATION AND LABORATORY TESTING

2.1 Published Research

As part of our investigation, we reviewed published geotechnical literature, including geologic, fault, and seismic hazard maps for the site and vicinity. A list of selected published references reviewed for this investigation is presented in Appendix A.

2.2 Aerial Photograph Studies

Our reconnaissance was augmented by studying vertical and oblique historical, aerial photographs of the site. The vertical aerial photographs that we studied are black and white (B&W), large-scale prints dated 1942, July 5, 1952, June 30, 1963 and June 23, 1981. Vertical aerial photographs from the California Coastal Records Project (www.californiacoastline.org) that we studied are dated April 18, 1986 and June 13, 1993. From Google Earth Maps we studied vertical aerial photographs dated September 10, 1998, June 3, 2003, December 31, 2004, June 11, 2005, June 25, 2006, May 24, 2009, April 24, 2010, May 31, 2012, August 17, 2013 and July 2, 2018. The 1998 photograph is b&w; the rest are in color.

In addition to reviewing vertical aerial photographs, we also obtained oblique-angle aerial photographs from the California Coastal Records Project (color) dated 1972, October 5, 1979, June 1987, November 14, 2002, October 4, 2005, September 27, 2009 and September 27, 2013. We qualitatively compared the aerial photographs to look for changes in the property that may be due to erosion. The 1972 and 2009 coastline oblique aerial photographs are presented on Plate 3.

2.3 Subsurface Exploration

Our subsurface exploration was conducted on January 23, February 19 and 20, 2019. The exploration consisted of drilling, logging and sampling 12 exploratory test borings. Test borings B-1 through B-4 were drilled using a truck-mounted Mobile B-53 drill rig utilizing 6-inch diameter solid-stem flight augers. The remaining borings were drilled using a track-mounted DR8K drill rig utilizing 4-inch diameter solid-stem flight augers. The borings were drilled to depths of 3.5 to 25.5 feet below the ground surface (bgs). The approximate boring locations are shown on the Site Geologic Map, Plate 2.

Our staff engineer and staff geologist made a descriptive log of each boring and obtained relatively undisturbed tube samples of the soil and bedrock materials encountered for visual classification and laboratory testing. Relatively undisturbed soil and bedrock samples were obtained using a 3.0-inch (CA) and 2.5-inch (CM) outside diameter modified California split-barrel sampler. The inside of the sampler barrels contained liners for retaining the soil and bedrock samples. The samplers were driven by a 140-pound drop hammer falling 30 inches per blow. Blows required to drive the CM and CA samplers were converted to Standard Penetration Test (SPT) blow counts[1] for correlation with empirical test data, using conversion factors of 0.64 (CA) and 0.79 (CM). Blow counts are presented on the boring logs alongside the sample locations.

Logs of the test borings showing the various soil and bedrock types encountered and the depths at which samples were obtained are presented on Plates 4 through 15. The soils are classified in accordance with the Unified Soil Classification System outlined on Plate 16. The various descriptive properties used to describe the soil and bedrock are listed on Plates 17 and 18, respectively.

2.4 Laboratory Testing

Soil and bedrock samples obtained during our subsurface exploration were transported to our laboratory and examined to confirm field classifications. Laboratory tests were performed on selected samples to estimate their pertinent geotechnical engineering characteristics. Laboratory testing consisted of moisture content, dry density, grain size, unconsolidated-undrained triaxial

[1] SPT blow counts provide a relative measure of soil consistency and strength, and are utilized in our engineering analyses.

compression and resistance (R-) value tests. The test results are presented opposite the samples tested on the boring logs. A key to test data is provided on Plate 16. Triaxial compression test data is presented on Plate 19. Resistance value test data is presented on Plate 20.

3.0 SITE CONDITIONS

The property is located on the north side of Albion Cove, approximately one-half mile northwest of the community of Albion. The site contains two prominent hills surrounded by gently-sloping terrace levels. One of the hills is in the northwesterly portion of the site and the other is in the south-central portion of the site. The south-central hill is approximately 195 feet in height, per Site Plan prepared by Schlosser, Newberger Architects. The northwesterly hill has two peaks; a westerly peak at approximately 173 feet in elevation and an easterly peak at approximately 189 feet in elevation. The proposed building site is on the west side of the easterly peak, within the saddle between the peaks, as shown on Site Photograph A, Plate 21. The planned family care unit straddles the dirt, access road south of an abandoned quarry, on the lower slopes of the northwest hill.

There are a couple of small hills at the northeast corner of the property, where the current entrance to the property is located. A dirt access road roughly follows the property line around the northwesterly hill to the abandoned rock quarry. The access road continues past the quarry around the lower slopes of the northwesterly hill.

An 80 to 120 feet high ocean bluff is on the southwest side of the property. The bluff slopes vary from 0.5H:1V to near vertical. The bluff has several small coves separated by elongated peninsulas. Several small sea caves are located at the back of the coves. One cave, visible in the 1979 oblique aerial photograph, collapsed prior to the 2005 oblique aerial photograph (see Plate 22).

A large, gently sloping terrace level is located in the easterly portion of the property. The planned, new driveway will connect to Highway 1 at the easterly end of the site. The new access road will cross a north-south trending drainage ditch before going up the northwesterly hill to the planned building site. The drainage ditch drains south, towards the property line before turning southwest toward the ocean bluff.

The northwest and south central hills are covered with brush and weeds with scattered trees. The drainage ditch area in the easterly portion of the property is lined with small trees. The terrace levels surrounding the hills are covered by mostly grasses with some brush.

Ponded water from recent rains was observed in the drainage area along the northerly access road. Beside a slight flow of water in the drainage ditch, no other surface water was observed on site. Groundwater was encountered in test borings, B-1, B-7 and B-8 at 16.5, 2.5 and 1.0 feet below the ground surface (bgs).

4.0 SITE GEOLOGY AND SOIL CONDITIONS

Site bedrock consists of Tertiary-Cretaceous, sandstone, silty sandstone, siltstone and shale of the Coastal Belt, Franciscan Complex. The Franciscan bedrock is generally massive. The sandstone, silty sandstone, and siltstone encountered in our borings are orange-brown to yellow-brown, crushed to intensely fractured, friable to moderately hard, and moderately to deeply weathered. The shale encountered in our borings is orange-black, crushed, has low hardness, and is deeply weathered.

Much of the subject property occupies a gently-sloping marine terrace that was formed during the Pleistocene Epoch, when periods of glaciation caused sea level fluctuations, which created a series of steps, or terraces, cut into the coastal bedrock by wave erosion. Shallow marine sediments (Pleistocene terrace deposits) were deposited on the wave-cut, bedrock platforms while they were submerged beneath the ocean during interglacial sea-level high stands. Some of these marine deposits have been locally eroded as the terraces began to emerge from the ocean due to uplift associated with the San Andreas Fault Zone during the middle and late Pleistocene. The knolls and saddles on site that are likely controlled by bedrock depth may potentially be the result of remnant ancient sea stacks. Present sea levels were achieved about 5,000 to 7,000 years ago.

The terrace deposits on site range from 1.0 to over 25.5 feet in thickness. The terrace deposits were deposited in lenses that are generally flat, with local undulations caused by the variable-energy nature of the depositional environment. The terrace deposits consist of beach or shallow marine sediments that are typically comprised of light brown sands with silt and occasional gravel, along with incorporated rock fragments from the underlying bedrock platform.

The two borings that were drilled at the site of the planned FCU, borings B-1 and B-2, encountered approximately 4.25 feet of brown sandy silt to silty sand (topsoil) that are generally porous and weak. Below the topsoils, the terrace deposits are light brown to orange-brown, loose to medium dense sand with occasional rock fragments and gravels.

BAI drilled four exploratory borings, B-5, B-6, B-10, and B-11 at the location of the planned single family residence. Borings B-5 and B-6 were drilled to approximately 25.5 feet bgs and 23.5 feet bgs respectively. Boring B-5 encountered 25.5 feet of terrace deposits, consisting of loose to dense, orange-yellow-brown sand and silty sand. No bedrock was encountered in boring B-5. Boring B-6 had 13.5 feet of loose to medium dense, orange-brown silty sand to sand terrace deposits. Yellow-brown sandstone was encountered at 13.5 feet that is closely fractured, low to moderately hard, and moderately weathered. Orange-brown, crushed, and deeply weathered siltstone of the Franciscan Complex was encountered in B-6 at 22 feet bgs to the depth explored.

Our borings near the knoll, B-10 and B-11, were drilled to 20 feet bgs and 11.5 feet bgs respectively. Approximately 2.5 feet of black silty sand topsoil over 2.0 feet of orange-brown, loose to medium dense silty sand terrace deposits was encountered in B-10. In boring B-11, 2.5 feet of silty sand topsoils were encountered. Franciscan Complex conglomerate, sandstone, siltstone, and shale were encountered below 4.5 feet bgs to the depths explored in B-10, while sandstone was encountered in B-11 below 2.5 feet bgs to depths explored. The Franciscan bedrock materials encountered were crushed to intensely fractured, soft to low in hardness and moderately to deeply weathered.

The driveway from the highway to the planned building site was investigated by drilling, logging and sampling 6 test borings. Borings B-3 and B-9, which were drilled on the hillside downslope of the building site, encountered 1 to 2 feet of dark brown-black topsoil over greywacke and sandstone. The topsoil consists of dark brown to brown-black gravelly sandy silt and silty sand. The silt is medium stiff to stiff and the sand is loose. The underlying greywacke in boring B-3 was crushed, moderately hard and deeply weathered. Practical drilling refusal was encountered at 4.5 feet bgs in borings B-3. The brown-orange to light yellow-brown sandstone was crushed, friable to low in hardness and deeply weathered.

Borings B-4, B-7, B-8 and B-12 were drilled in the terrace level between the highway and the northwesterly hill at the property. Boring B-4, in the central portion of the driveway encountered 3 feet of topsoil over 3.5 feet (maximum depth exposed) of terrace deposits. The topsoil consists of dark brown, loose, silty sand. The terrace deposits consist of 2.5 feet of orange-brown, loose, silty sand over brown-orange, medium dense, clean (little or no clay or silt) sand.

Borings B-7, B-8 and B-12 were drilled in the easterly portion of the driveway. Boring B-8, within the planned, asphalt-paved turn-around near Highway 1, encountered 2.5 feet of brown-black, medium dense, silty sand topsoil over orange-brown, silty sandstone. The sandstone was intensely fractured, friable and deeply weathered.

Borings B-7 and B-12 were drilled near the north-south trending drainage ditch. The two borings encountered 1.25 to 2.5 feet of dark brown-black, loose, silty sand topsoil. The topsoil was underlain by orange-brown sandstone and silty sandstone that were crushed to intensely fractured, friable to low hardness and moderately to deeply weathered.

The seismicity and tectonics of the Mendocino County coastal region are controlled by a network of generally northwest-trending strike-slip faults of the San Andreas Fault system. The active San Andreas Fault (north coast segment) is located offshore, approximately 3.05 miles southwest of the site. Future, large magnitude earthquakes originating on the San Andreas, or other nearby faults are expected to cause strong ground shaking at the site.

No evidence of active faulting was observed in the site vicinity. No geomorphic evidence of recent fault movement, such as scarps, offset creek channels, linear features observable on the vertical, aerial photographs, etc., was observed in the property vicinity. The published references we reviewed for this investigation do not show faults on or trending towards the site.

No evidence of landsliding was observed in the area of the planned building site vicinity or elsewhere on the property except for the previously-mentioned, collapsed sea cave. None of the published references that we reviewed show landslides in the property vicinity.

5.0 DISCUSSION AND CONCLUSIONS

5.1 General

Based on the results of our reconnaissance and subsurface exploration, we conclude that the site is geologically and geotechnically suitable for the proposed residence, FCU and driveway. The main geological/geotechnical considerations affecting the proposed construction are loose and porous near-surface soils, difficult excavation in bedrock, differential settlement between thick, weak terrace deposits and relatively-hard bedrock areas, strong seismic shaking from future earthquakes and potential liquefaction. These considerations and their possible mitigation measures are discussed below.

5.2 Loose and Porous Surface Soils

The planned building areas are covered by one foot to up to approximately 9.5 feet of surface soils that contain roots and have a weak, porous consistency. These soils are susceptible to collapse and consolidation under light to moderate loads, and are not suitable for support of foundations or slab-on-grades in their current condition. Recommendations for deepening foundations below this weak soil zone are presented in the Section 6.0 of this report. Alternatively, removing a portion of the loose topsoil and replacing it with compacted fill can mitigate the detrimental effects.

5.3 Difficult Excavation

Test borings B-2, B-3 and B-6 encountered practical drilling refusal in moderately hard bedrock at 14.5, 4.5 and 23.25 feet bgs, respectively. Other hard bedrock areas may be present at the site.

5.4 Differential Settlement

The proposed residence building site is on the saddle adjacent to the easterly peak of the northwesterly hill. The saddle is underlain by more than 25.5 feet of loose to very dense sands. In contract, the easterly peak is comprised of 2.5 to 4.5 feet of loose to medium dense sands over relatively hard bedrock. Foundation placed upon relatively hard bedrock and extending over loose terrace sands would have a significant potential for differential settlement. This potential can be mitigated by grading a compacted fill pad to support the house and garage. The pad should be created by excavating the terrace sands and the encountered bedrock and replacing with compacted fill to allow for a uniform, compacted fill thickness under the house foundations.

5.5 Seismicity and Faulting

As is typical of the Mendocino County area, the site will be subject to strong ground shaking during future, nearby, large magnitude earthquakes originating on the active San Andreas fault, Maacama fault, or possibly other, more distant fault systems. The intensity of ground shaking at the site will depend on the distance to the causative earthquake epicenter, the magnitude of the shock, and the response characteristics of the underlying earth materials. Generally, structures founded in supporting materials and designed in accordance with current building codes are well suited to resist the effects of ground shaking.

No evidence of recent faulting was observed by BAI or shown in the site vicinity on the published geologic maps that we reviewed for this investigation. The presence of ancient faults within the coastal bluffs is common, and should not impact the proposed structures due to the fault inactivity. Therefore, the potential for fault rupture at the site is considered low.

5.6 Soil Liquefaction and Densification

Liquefaction results in a loss of shear strength and potential soil volume reduction in saturated sandy, silty, silty/clayey, and coarser gravelly soils below the groundwater table from earthquake shaking. Densification occurs above the groundwater table and results in partial or total loss of support during the earthquake. The occurrence of this phenomenon is dependent on many factors, including the intensity and duration of ground shaking, the soil age, density, particle size distribution, and elevation of the groundwater table.

Our test borings indicate that the terrace deposits have a potential for liquefaction. To evaluate liquefaction potential, we performed laboratory testing of the soils and a liquefaction analysis. The results of our analysis indicate that the potential for liquefaction at the site during a design earthquake is low to moderate. This analysis was based on procedures by Idriss and Boulanger, 2008, with 2014 update.

Where the factor of safety for liquefaction was 2.0 or less, we performed an analysis to estimate induced vertical settlement due to liquefaction. This analysis was based on procedures by Idriss and Boulanger, 2008, with 2014 update.

Lateral spreading is generally caused by liquefaction of marginally stable soils underlain by gently to steeply-inclined slopes. In these cases, the saturated soils move toward an unsupported face, such as an incised river channel, cut slope or bluff face.

The results of our analysis for liquefaction induced settlement and lateral spreading are shown in the following table. The soil layers of possible liquefaction are marked on the boring logs as "Zone". Liquefaction analysis results are presented in Appendix B.

Table 1: Liquefaction Induced Settlement and Lateral Spreading		
Boring	Settlement (inches)	Lateral Spreading (inches)
B-1	0	1.3
B-2	0.3	5.7
B-5	0.6	9.8
B-6	0.4	9.3
B-10	0.1	1.6
B-11	0	1.4

To mitigate the concern of liquefaction, the proposed residence and FCU should be supported on a compacted fill pad or drilled piers into competent bedrock.

5.7 Bluff Retreat

For our analysis, we used qualitative comparisons of the 1942 through 2018 vertical aerial photographs as well as the 1972 through 2013 oblique aerial photographs. Our qualitative comparison of the vertical and oblique aerial photographs shows minor changes to the bluff edges at the site, due to erosion and rock falls. The previously-mentioned, collapsed sea cave is a localized feature, not representative of the entire Schaffer coastline. Our site reconnaissance and quantitative review of aerial photographs indicate an average bluff retreat (erosion) rate along the ocean bluffs of approximately one-half to one inch per year.

BAI's estimated erosion rate is significantly less than the rate given in Open File Report 2007-1133 (approximately 16 inches per year) for this region. If the USGS rate were accurate, the bluff edge would have retreated over 101 feet in the last 76 years (1942 to 2018, our earliest aerial photograph up to the most current). One hundred and one feet of bluff loss would be easily visible in the aerial photographs that we reviewed for this project, which clearly is not the case.

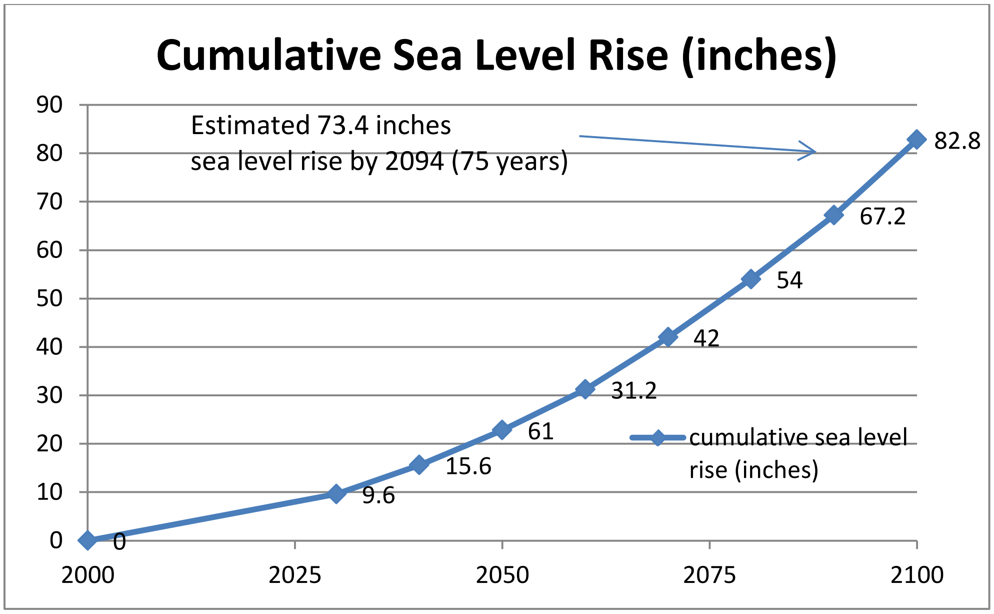
5.8 Sea Level Rise Effects on Bluff Retreat

Rapid sea-level rise of approximately 400 - 450 feet occurred between 18,000 and 8,000 years before present, according to "Rising Seas in California", Griggs, et al, 2017. Sea levels have remained relatively constant since that time. However, sea levels have started rising again. The California Coastal Commission (CCC) recently adopted the Science Update, dated November 7, 2018 to the 2015 Interpretive Guidelines for addressing Seal Level Rise in Local Coastal Programs and Coastal Development permits. The Science Update provides sea-level rise projections for the San Francisco coastal area, as follows in Table 2:

Table 2: Sea Level Rise Projections (Medium-High Risk Aversion)		
Time Period	Sea Level Rise (Feet)	Inches
2030	0.8	9.6
2040	1.3	15.6
2050	1.9	22.8
2060	2.6	31.2
2070	3.5	42.0
2080	4.5	54.0
2090	5.6	67.2
2100	6.9	82.8

The CCC requires a 75-year lifespan for new, coastal house construction or major remodel. As of 2019, we should have experienced a sea level rise of 5 inches, although we are not aware of any studies documenting such a rise. According to Dr. Mark Johnsson, former California Coastal Commission staff geologist, sea level rise on the west coast has been "lagging", but will eventually come up to expectations. Recent projections show that by 2094, the sea level will be as much as 73.4 inches higher than present (2019).

Using the CCC's economic lifespan of a building of 75 years, we must consider the effects of sea level rise for a structure built circa 2019 through 2094. For this discussion, we will assume a linear rate of sea level rise (which may or may not be the case) in order to estimate a projected sea level rise of approximately 73.4 inches (6.1 feet) by 2094.



Based upon historic aerial photographs and site observations, the current historic, average bluff retreat rate appears to be less than one inch per year, which we are rounding up to 1.0 inch per year. Although the bluff toe will still be partially protected by the boulder beach (see Plate 3), the retreat rate should increase to approximately 2.5 inches per year after 2070 as the bluff toe is continually subject to strong wave activity.

Cumulative sea level rise is from 2019. Table 3 sums up the amount of projected retreat using estimated retreat rates over a 75-year span from a time of 2019 construction. This results in a total bluff retreat of 12 feet.

Table 3: Bluff Retreat Rate				
Years	Span (years)	Cumulative Sea Level Rise (inches)	Retreat Rate (inches per year)	Amount of Retreat (inches)
2019-2030	11	10”	1.0”/yr.	11
2030-2050	20	23”	1.5”/yr.	30
2050-2070	20	42”	2.0”/yr.	40
2070-2094	24	73”	2.5”/yr.	60
				141” = 12’

5.9 Tsunami Hazard

As typical of the Mendocino County coastal area, the site could be subject to large storm waves or tsunami waves. In February 1960, the Point Cabrillo Light House was damaged by an approximately 60 feet high storm wave (meteorological tsunami, or “meteotsunami”). No such waves are recorded at the light house from 1909, the year it was built, to 1960. Nor have such large waves occurred since 1960. Since the ocean bluffs at the property are approximately 80 to 120 feet in vertical height, impact or inundation from a severe storm surge or tsunami event is not considered a risk for the site.

Tsunamis are caused by large-scale sea floor elevation changes resulting from earthquakes on thrust faults associated with tectonic subduction zones. Major earthquakes have occurred along these Pacific Rim subduction zones in recent times; however, no significant tsunami in the Mendocino coastal zone has resulted from these earthquakes. Tsunami damage has been limited to boats and docks within the coves and harbors in Mendocino County. There are several factors that minimize the tsunami potential for Mendocino County:

- The San Andreas Fault is a strike slip fault. Earthquake fault rupture causes ground shifting relative to one side versus the other, but does not result in large, vertical uplift.
- The Mendocino Escarpment is a large, undersea ridge that extends west of Cape Mendocino. The ridge forms a partial wall that runs a few hundred miles to the west. According to Trenkwalder and Stover, the overall effect is that tsunami waves running south toward the escarpment tend to turn north "to impinge on Crescent City".
- In the area south of the Mendocino Escarpment, the ocean is deeper than in the region north of the escarpment. This effect causes a dispersion and reduction in tsunami wave energy in the coastal waters south of Cape Mendocino.

6.0 RECOMMENDATIONS

6.1 Setbacks

Based on our aerial photograph analysis (Table 3), we have determined a projected retreat of approximately 12 feet over the next 75 years. Using a safety factor of 2, the resulting bluff setback would be 24 feet. Adding an additional safety factor of 2.0 in consideration of the collapsed sea cave, we recommend a total bluff setback of 48 feet.

6.2 Site Grading

6.2.1 Clearing and Stripping

Areas to be graded should be cleared of existing vegetation, rubbish, and debris. After clearing, surface soils that contain organic matter should be stripped. In general, the depth of required stripping will be about 4 to 6 inches; deeper stripping and grubbing may be required to remove stumps and concentrations of organic matter or roots. The cleared materials should be removed from the site; however, strippings can be stockpiled for later use in landscape areas.

6.2.2 Fill and Cut Slopes

Fill and cut slopes should be constructed at an inclination of 2H:1V (horizontal to vertical) or flatter. At the toe of fill slopes, an initial keyway should be excavated a minimum of one foot into supporting soil on the downhill side, in accordance with the Keyway/Bench Drainage Detail, Plate 23. Depending on the locations of the keyway, depths will need to be determined by BAI. The initial keyway excavation should have a downward gradient of about two-percent into the slope.

The initial excavation (keyway) should have a perforated pipe and gravel drain placed on the uphill side, as shown in the Keyway/Bench Drainage Detail, Plate 23. The perforated pipe should be a 4-inch diameter, SDR 35, or other non-corrosive equivalent pipe with a pipe stiffness of at least 40 pounds per square inch. The pipe should be placed with the perforations down. The gravel should consist of clean, free-draining gravel or crushed rock graded from 1½ inches maximum to ½ inch minimum in size, or Class 2 Permeable Material per Section 68 of Caltrans Standard Specifications. Drain rock, excluding the Class 2 Permeable Material, should be completely wrapped in geotextile filter fabric (Mirafi 140, or equivalent) so that there is no natural soil/drain rock contact.

6.2.3 Structural Area Preparation

As used in this report, "Structural Areas" refers to the foundation envelope and the areas extending five feet beyond their perimeters, and to pavement and exterior concrete slabs areas and the areas extending three feet beyond their edges.

Within Structural Areas, existing weak soils should be removed to a depth of at least 4 foot below soil subgrade as determined in the field by BAI. Deeper excavating may be necessary to remove isolated, very weak soils.

After the recommended excavations are complete, BAI should observe the soils encountered to confirm suitable materials are exposed. The exposed soils should then be scarified to about six inches deep; moisture conditioned to at least optimum moisture content and compacted to at least 90 percent relative compaction as determined by the ASTM D 1557 test procedure, latest edition. These moisture conditioning and compaction procedures should be observed by BAI to check that the soil is properly moisture conditioned and the recommended compaction is achieved.

Prior to fill placement, within the residence and FCU building areas a geotextile stabilization fabric, such as Mirafi HP Series, or equal, should be placed over the excavation bottom in accordance with the manufacturer’s specifications. Native soils are suitable for use as compacted fill.

Fill material, on-site or imported, should be free of perishable matter and rocks greater than four inches in largest dimension, have an expansion index less than 30 and be approved by BAI before fill placement. Fill should be placed in thin lifts (six to eight inches depending on compaction equipment), moisture conditioned to near optimum moisture content, and compacted to at least 90 percent relative compaction, to achieve planned grades.

6.3 Foundation Support

6.3.1 General

As encountered in our test borings, most of the building areas are underlain by approximately 1.0 to 9.5 feet of weak soils. Our test borings within the residence and FCU building areas encountered soils that have a potential for liquefaction at depth. These soils are unsuitable for foundation support in their current state. Structure foundations and concrete slabs placed directly upon these soils could undergo damaging differential settlement due to porous soil collapse when loaded in a saturated condition or liquefaction. Foundation-supporting elements must penetrate through these upper, weak soils using deepened drilled piers or be founded within compacted fill placed in accordance with the recommendations above. Our recommendations pertaining to both alternatives are presented below.

6.3.2 Spread Footings Residence and FCU

Support for the residence and FCU can be obtained on reinforced concrete spread footings founded in the compacted fill pad. Footings founded in compacted fill should be at least 12-inches in depth for a single story residence and 18-inches for a two-story residence. At least three feet of compacted fill (placed as recommended in the Section 6.2 of this report) should underlie the bottom of foundation elements. This would require a compacted fill pad thickness of minimum 4.0 feet for a single story residence. Footings can be assigned a soil bearing pressure of 2,500 pounds per square foot (psf) for dead plus long-term-live loads. A 25 percent increase in bearing pressure is allowable for dead plus all live loads, and a 50 percent increase in bearing pressure is allowable for total loads, including wind or seismic loads. Footings should be no less than 12 and 15 inches wide for one and two-story construction, respectively, isolated footings should be at least 18 inches wide. The spread footings should be designed to span a distance of at least three feet of unsupported footing due to the potential for liquefaction differential settlement.

No subsurface structures (such as subsurface walls, tanks, other foundations, or utility lines) should extend below the footings, or within a zone defined by a 45-degree angle projected downward from the outside, bottom edges of the footings. Completed foundation excavations should be observed by BAI prior to the placement of reinforcing steel.

Resistance to lateral loads can be obtained using passive earth pressure against the face of the foundations. An allowable passive pressure of 300 psf per foot of depth below compacted fill subgrade and frictional resistance of 0.30 times net vertical dead load, are appropriate for footing elements poured neat against supporting or approved engineered fill soils, if required.

6.3.3 Spread Footings Retaining Walls

The retaining walls can be supported on reinforced concrete footings founded in supporting bedrock or compacted fill placed in accordance with our recommendations. Foundations for the retaining walls should be completely in compacted fill or supporting soil or bedrock; foundations should not be in (span) different bearing material. Retaining walls that are attached or part of a structure should be underlain by compacted fill as noted in section 6.3.2. Retaining walls that are not attached to a structure can be founded in compacted fill or bedrock. Footings founded in compacted fill can be designed using an allowable soil bearing pressure of 2,000 pounds per square foot (psf) for dead plus live loads. Footings founded in bedrock can be designed using an allowable bearing pressure of 3,000 psf for dead plus lie loads. A 33 percent increase in bearing pressure is allowable for total loads, including wind or seismic loads.

Footing elements should be founded at least 18 inches below lowest adjacent finish grade. Footings adjacent to a slope face should be bottomed so that the downhill side of footing toe is at least 8 feet horizontal distance from face of adjacent slope. Completed foundation excavations should be observed by BAI prior to the placement of reinforcing steel, to check for conformance with our recommendations.

Resistance to lateral loads can be obtained using passive earth pressure against the face of the foundations. An allowable passive pressure of 300 psf per foot of depth below compacted fill subgrade and frictional resistance of 0.30 times net vertical dead load, are appropriate for footing elements poured neat against supporting or approved engineered fill soils, if required.

6.3.4 Drilled Piers

Support for the new residence and FCU can be obtained using cast-in-drilled-hole, reinforced-concrete piers interconnected with grade beams. Drilled piers should be at least 18 inches in diameter and should be embedded a minimum of four feet into supporting bedrock, as determined by BAI. The bedrock within the FCU area was encountered at approximately 14.5 to 16.5 feet bgs. The pier depths are anticipated to be approximately 19 to 21 feet bgs. The bedrock within the residence area was encountered at approximately 2.5 to over 25.5 feet bgs. The pier depths are anticipated to be approximately 7 to 30 feet bgs. Pier length and diameter should be determined by a structural engineer based on our recommendations.

Pier spacing should be no closer than 3 pier diameters, center to center. The drilled piers should be designed to gain support from skin friction. A skin friction value of 500 pounds per square foot (psf) of shaft area may be used in the bedrock, for dead loads plus live loads. A skin friction value of 200 pounds per square foot (psf) of shaft area may be used in the soils below the potential liquefaction zone, for dead loads plus live loads. For total downward loads due to wind or seismic forces, the pier capacity can be increased by one third. Uplift frictional capacity for piers should be limited to 2/3 of the allowable downward capacity. Both downward and uplift frictional capacity should be neglected in the soil within and above the potential liquefaction zone. When final pier depths have been achieved, as determined by BAI, the bottoms of the pier holes should be cleaned of loose materials. BAI should observe the drilling and final clean out of the pier holes, prior to the placement of reinforcing steel and/or concrete.

During bidding, we recommend that proposed drillers be given a copy of this report to review. No caving was encountered in our borings, however caving could occur within the silty sand or sand, the driller should be prepared to case pier holes where caving occurs.

If groundwater is encountered during construction, the pier holes should be dewatered prior to placement of reinforcing steel and concrete. Alternately, if more than six inches of groundwater has entered the pier hole, concrete can be tremied in to place with an adequate head to displace water or slurry. Concrete should not be placed free fall or in such a manner as to hit the sidewalls of the pier hole.

Difficult drilling conditions were encountered in our borings. The drilling contractor should be prepared to use rock-coring equipment to achieve full depth.

Resistance to lateral loads can be obtained using passive earth pressure against the face of the foundations. An allowable passive pressure of 300 psf per foot of depth into the supporting soil or bedrock can be used for the drilled piers. Passive pressure should be neglected in the soil within and above the potential liquefaction zone. If drilled piers are used, passive pressure can be projected over two pier diameters, however, should not be used below depths of about 8 pier diameters from top of piers.

6.4 Seismic Design Criteria

The structures should be designed and/or constructed to resist the effects of strong ground shaking (on the order of Modified Mercalli Intensity IX) in accordance with current building codes. The California Building Code (CBC) 2016 edition indicates that the site classification for the property is Site Class F, due to the potential of liquefaction. For design purposes BAI is using Site Class D. Accordingly, CBC indicates that the following seismic design parameters are appropriate for the site:

Table 4: Seismic Design Parameters		
Site Class	=	D
Mapped Spectral Response Acceleration at 0.2 sec	S_S =	1.674g
Mapped Spectral Response Acceleration at 1.0 sec	S_1 =	0.771g
Modified Spectral Response Acceleration at 0.2 sec	S_{MS} =	1.674g
Modified Spectral Response Acceleration at 1.0 sec	S_{M1} =	1.157g
Design Spectral Response Acceleration at 0.2 sec	S_{DS} =	1.116g
Design Spectral Response Acceleration at 1.0 sec	S_{D1} =	0.771g
Site Coefficient	F_a =	1.0
Site Coefficient	F_v =	1.5
Seismic Design Category	=	E

6.5 Asphalt Paved Areas

For pavement designs, we used an R-value of 70, assumed Traffic Index (T.I.) of 5.0 for the asphalt approach apron onto highway 1, and Caltrans flexible pavement design procedures. R-Value test data can be found on Plate 20. Our recommendation for minimum asphalt pavement thicknesses is presented in the following table:

Table 5: Pavement Design Thickness		
T.I.	Thickness (inches)	
	Asphalt Concrete (AC) Surfacing	Class 2 Aggregate Base (AB)
4.0	2.5	4.0
5.0	2.5	6.0
6.0	3.0	6.0

These thicknesses are the recommended minimums. Increasing asphalt concrete thickness in place of Class 2 Aggregate Base would increase the life and durability of the pavement section.

Weak soils within pavement areas should be removed and replaced with compacted fill to at least 90 percent relative compaction, as described in Section 6.1 of this report. The upper 6 inches of subgrade soils should be compacted to at least 95 percent relative compaction to provide a smooth, unyielding surface.

Class 2 Aggregate Base should have a minimum R-value of 78 and conform to the requirements contained in Section 26 of Caltrans (State of California) Standard Specifications, latest edition. Aggregate base should be placed in thin lifts and in a manner to prevent segregation; moisture conditioned to near optimum moisture content, and compacted to at least 95 percent relative compaction to provide a smooth unyielding surface.

6.6 Concrete Slab-on-Grade

Concrete slab-on-grade floors should be supported on properly compacted fill soils placed in accordance with our recommendations previously presented in Section 6.1 Site Grading. Interior concrete slab floors should be underlain by at least four inches of clean, free-draining crushed rock, graded in size from 3/4 inches maximum to 1/4 inches minimum, to act as a capillary moisture break. An underslab drain should be constructed as shown on the attached Plate 24. Shrinkage cracks within the subgrade soils should be closed by wetting before gravel or rock placement.

Where migration of moisture through the floor slab would be detrimental to its intended use, the installation of a vapor retarder membrane should be considered. The moisture/vapor retarder geomembrane, placed upon the gravel layer, should be at least 15 mils thick (i.e., Stego ® Wrap 15-mil Class A, Carlisle RMB 400 15-mil Class A, or equivalent), installed in accordance with the manufacturer's specifications to prevent moisture migration through the seams. With a 15-mil minimum thickness membrane, the 2 inches of wetted sand typically placed upon the membrane may be omitted. Construction of moisture/vapor retarders does not guarantee the prevention of moisture moving through the floor slab. However, this provision should substantially reduce the potential for moisture-vapor problems on the floors and/or future mold and mildew problems.

If a structural concrete slab is used (i.e., the slab is supported by and able to span between, interconnecting foundation elements without gaining support from underlying soil), then over-excavation of the near-surface weak soil zone is not required. However, topsoils containing organics should be removed beneath the planned slab (as much as four inches to six inches in depth below existing ground surface).

6.7 Retaining Walls

Subsurface or retaining walls should be provided with permanent back drainage to prevent buildup of hydrostatic pressure. Drainage and backfill details are presented on Plate 25. In areas where movement of moisture/vapor through the wall would be detrimental to its intended use, installation of a vapor retarder membrane should be considered. Construction of vapor retarders does not guarantee the prevention of moisture moving through concrete walls. Quality, placement and compaction requirements for backfill behind subsurface walls are the same as previously presented for fill. Light compaction equipment should be used near the wall to avoid overstressing the walls. Retaining walls should be designed to resist the lateral earth pressures presented on Plate 26.

In addition to static loads, the retaining walls should also be designed to resist potential seismic loads, in accordance with CBC requirements. For seismic loads, a pressure increment equivalent to an inverted triangular distribution is recommended, varying from 0 (zero) pounds per square foot (psf) at the bottom of the wall to 20H psf at the top of the embedded portion, where "H" is the height of the embedded portion (resultant dynamic thrust act at 0.6H above the base of the wall). The resultant distribution of both static and seismic pressures will thus be trapezoidal.

6.8 Site Drainage

Because surface and/or subsurface water is often the cause of foundation or slope stability problems, care should be taken to intercept and divert concentrated surface flows and subsurface seepage away from the building foundations and the bluff edge. Roof runoff water should be directed away from the buildings and dispersed, as much as practical, across the lot. Roofs should be provided with gutters and the downspouts should be connected to a closed conduit and discharged away from foundations and slopes. Drainage across the lot should be by sheet-flow. Surface grades should maintain a recommended five percent gradient away from building foundations.

If a raised wood floor is used, the area under the floor should be graded to drain towards an under house drain with a conduit outlet(s) through the footings/stem walls. Two-inch or four-inch PVC sleeves, or equivalent should be placed within the forms, at or slightly below ground level, prior to concrete placement.

7.0 ADDITIONAL SERVICES

Prior to construction, BAI should review the final grading and foundation plans, and geotechnical related specifications for conformance with our recommendations. During construction, BAI should provide periodic observations, together with the appropriate field and laboratory testing during site preparation, subdrain installations, and placement and compaction of fills. Foundation excavations should be reviewed by BAI while the excavation operations are being performed. Our reviews and tests would allow us to check that the work is being performed in accordance with project guidelines, confirm that the soil and bedrock conditions are as anticipated, and to modify our recommendations, if necessary.

8.0 LIMITATIONS

This geotechnical investigation and engineering geologic reconnaissance of the property were performed in accordance with the usual and current standards of the profession, as they relate to this and similar localities. No other warranty, expressed or implied, is provided as to the conclusions and professional advice presented in this report. Our conclusions are based upon reasonable geological and engineering interpretation of available data.

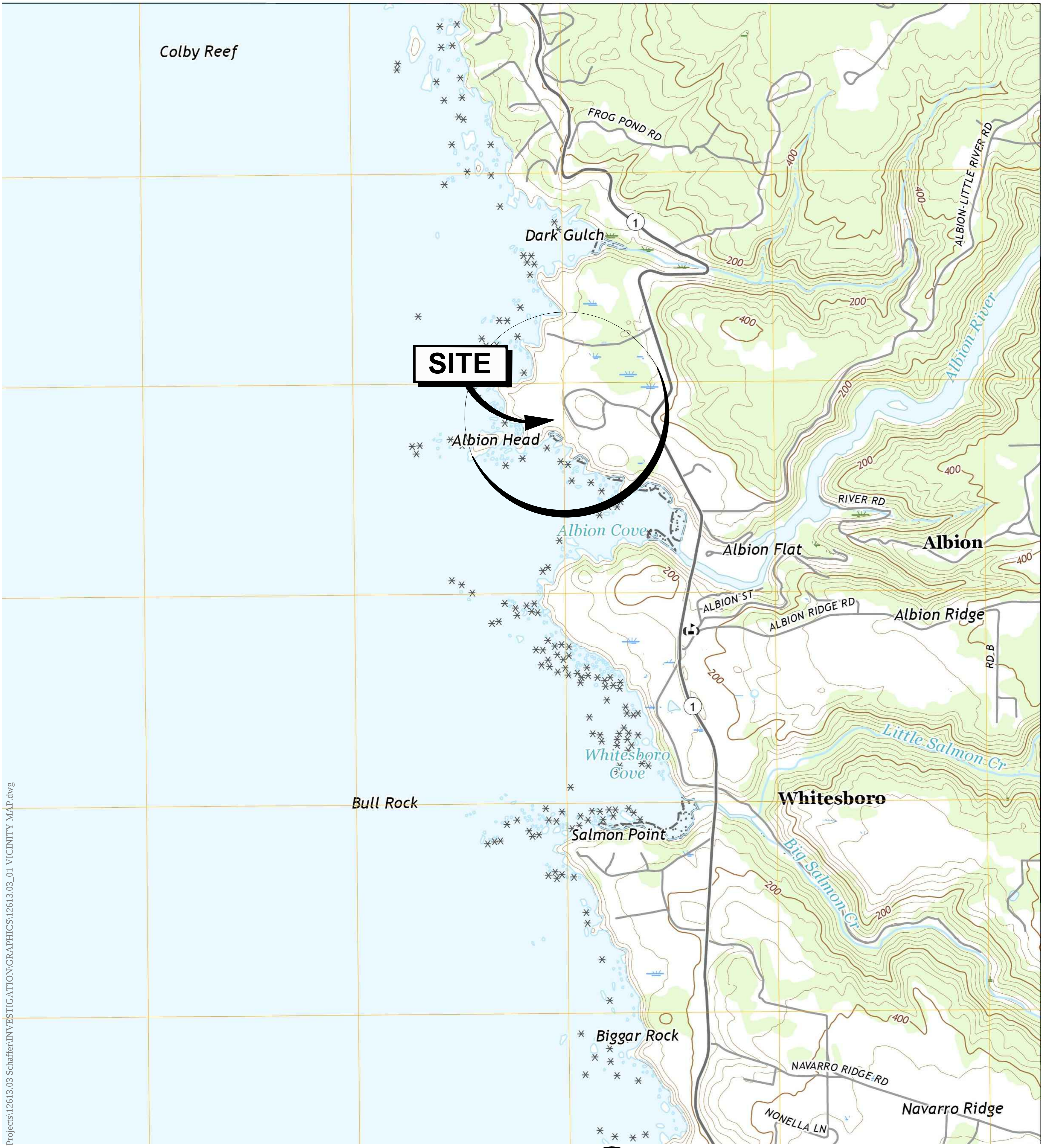
The samples taken and tested, and the observations made, are considered to be representative of the site; however, soil and geologic conditions may vary significantly between test borings and across the site. As in most projects, conditions revealed during construction excavation may be at variance with preliminary findings. If this occurs, the changed conditions must be evaluated by BAI, and revised recommendations be provided as required.

This report is issued with the understanding that it is the responsibility of the Owner, or his/her representative, to insure that the information and recommendations contained herein are brought to the attention of all other design professionals for the project, and incorporated into the plans, and that the Contractor and Subcontractors implement such recommendations in the field. The safety of others is the responsibility of the Contractor. The Contractor should notify the owner and BAI if he/she considers any of the recommended actions presented herein to be unsafe or otherwise impractical.

Changes in the condition of a site can occur with the passage of time, whether they are due to natural events or to human activities on this, or adjacent sites. In addition, changes in applicable or appropriate codes and standards may occur, whether they result from legislation or the broadening of knowledge. Accordingly, this report may become invalidated wholly or partially by changes outside of our control. Therefore, this report is subject to review and revision as changed conditions are identified.

The recommendations contained in this report are based on certain specific project information regarding type of construction and current building location, which have been made available to us. If conceptual changes are undertaken during final project design, we should be allowed to review them in light of this report to determine if our recommendations are still applicable.

ILLUSTRATIONS



REFERENCE:
Albion Quadrangle
7.5-Minute Series, USGS, 2018

Latitude: 39.231881
Longitude: -123.774344

NORTH

APPROXIMATE SCALE (FEET)
0 1000 2000 4000

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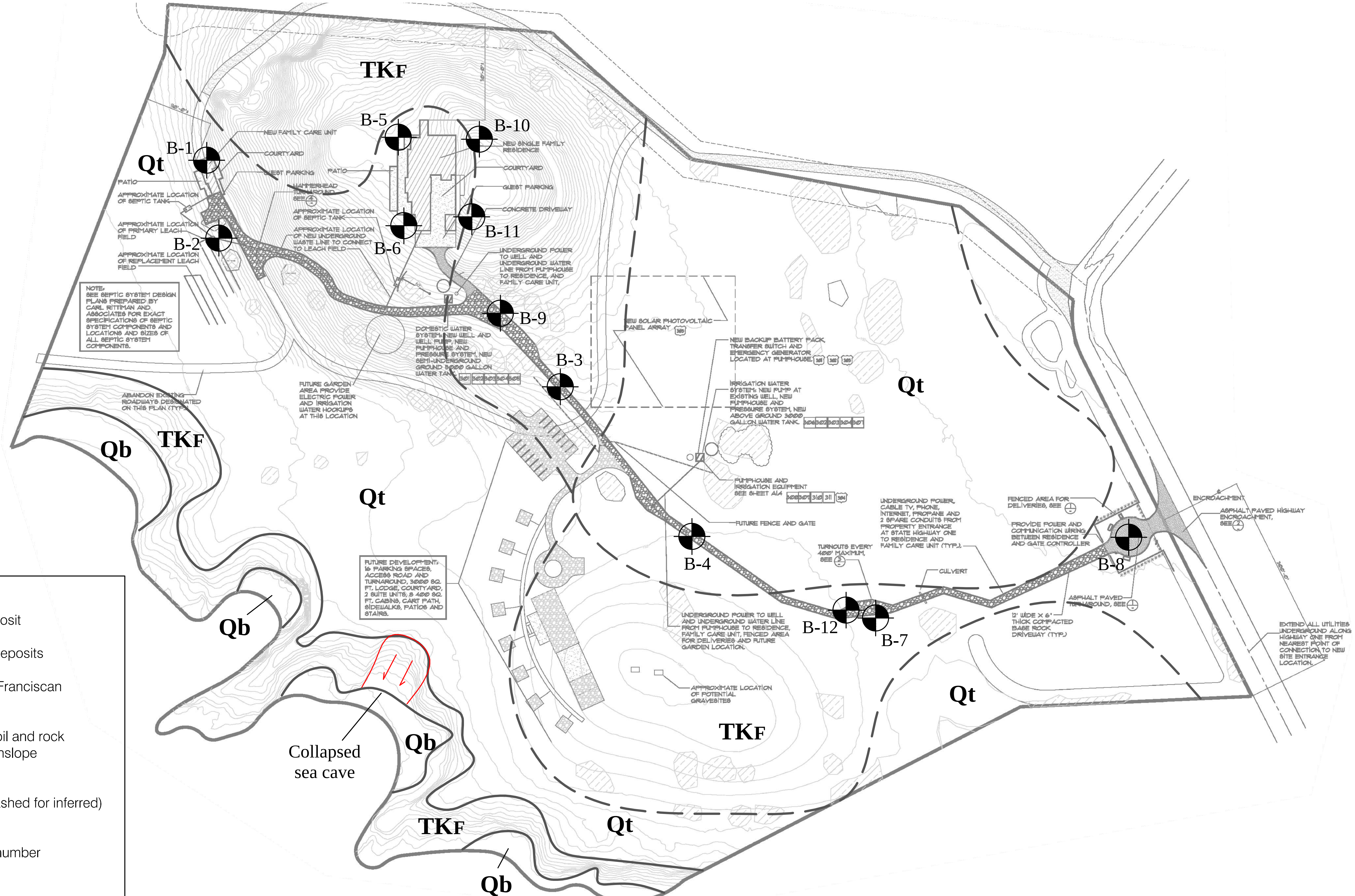
9/20/2019 11:30:34 AM plot date

Brunsing Associates, Inc.
5468 Skylane Blvd., Suite 201
Santa Rosa, California 95403
Tel: (707) 528-6108

Job No.: 12613.03
Appr.: KAC
Date: 09/20/19

VICINITY MAP
PROPOSED SCHAFFER RESIDENCE,
FAMILY CARE UNIT AND DRIVEWAY
3890 North Highway 1
Albion, California

PLATE
1



LEGEND

Qb	Holocene beach deposit
Qt	Pleistocene terrace deposits
TKF	Tertiary-Cretaceous Franciscan Complex
	Landslide deposit, soil and rock debris moving downslope
	Geologic contact (dashed for inferred)
B-12	Boring location and number

REFERENCE: Site Plan, prepared by Schlosser, Newberger Architects dated 7-5-19

NORTH

APPROXIMATE SCALE (FEET)

0 75 150 300

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Date: 09/20/19

SITE GEOLOGIC MAP
PROPOSED SCHAFFER RESIDENCE,
FAMILY CARE UNIT AND DRIVEWAY
3890 North Highway 1
Albion, California

PLATE
2

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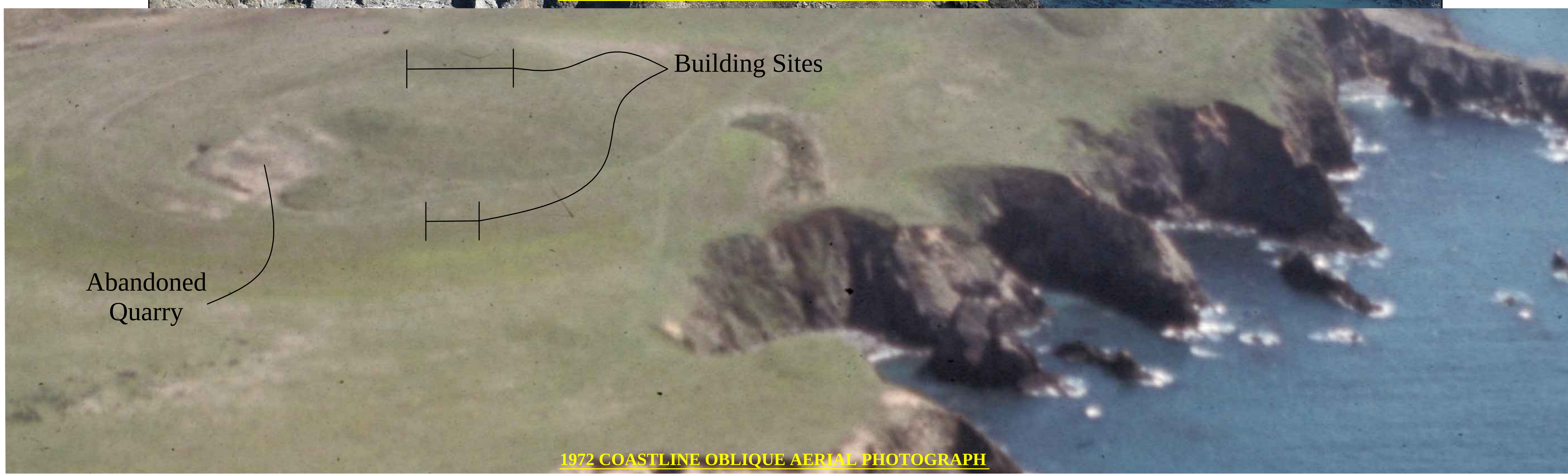
2009 COASTLINE OBLIQUE AERIAL PHOTOGRAPH



1972 COASTLINE OBLIQUE AERIAL PHOTOGRAPH

Reference:
California Coastal Records project, www.californiacoastline.org, by permission.

Brunsing Associates, Inc. 5468 Skylane Blvd., Suite 201 Santa Rosa, California 95403 Tel: (707) 528-6108	**Job No.:** 12613.03 **Appr.:** KAC **Date:** 09/20/19	**1972 and 2009 COASTLINE OBLIQUE AERIAL PHOTOGRAPHS** PROPOSED SCHAFFER RESIDENCE, FAMILY CARE UNIT AND DRIVEWAY 3890 North Highway One Albion, California	**PLATE** **3**

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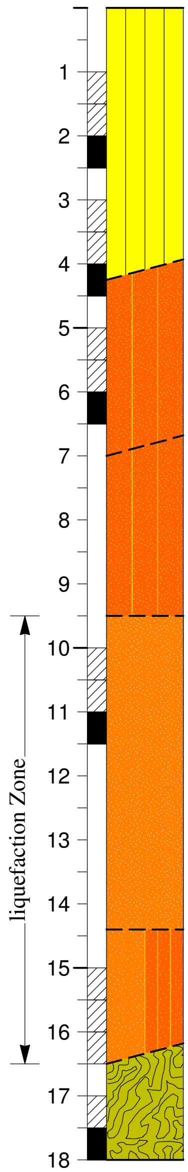
Log of Boring B- 1

Equipment: Mobile B-53; 6-inch solid-stem flight auger

Date: 1/23/19 **Logged By:** ZEM

Elevation: 136 feet *** **Latitude:** 39.232625 **Longitude:** -123.776055

Laboratory Tests	Sampler Type*	Moisture Content (%)	Dry Density (pcf)	Blows/foot	Depth (ft.)
	CA			4 **	2
Tx 794 (864)	CA	17.7	95	5 **	4
	CA			7 **	6
5% Passing #200	CA			24 **	11
5% Passing #200	CA			20 **	16
	CM			32 **	17.5



BROWN SANDY SILT (ML)
soft to medium stiff, damp
with rock fragments
porous, with roots

ORANGE-BROWN SILTY SAND (SM)
loose, damp
with rock fragments and gravel

LIGHT BROWN SAND (SM)
loose to medium dense, damp
with rock fragments

LIGHT BROWN-ORANGE POORLY GRADED SAND (SP)
medium dense, moist
with rock fragments

ORANGE POORLY GRADED SAND (SP-SM) with silt and gravels
medium dense, wet to saturated
some large rounded rock fragments

ORANGE-BROWN META GRAYWACKE
crushed, moderately hard, moderate to deeply weathered

Notes:
1. No caving
2. Free water encountered at about 16.5 feet

Latitude/Longitude estimated from Google Earth.
* See Soil Classification Chart & Key to Test Data
** Equivalent "Standard Penetration" Blow Counts.
*** Elevations interpolated from Plate 2.

Scale: 1" = 3'

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Job No.: 12613.03
Appr.: EEO
Date: 09/20/19

LOG OF BORING B- 1
PROPOSED SCHAFFER RESIDENCE,
FAMILY CARE UNIT AND DRIVEWAY
3890 North Highway 1
Albion, California

PLATE 4
SHEET 1 of 1

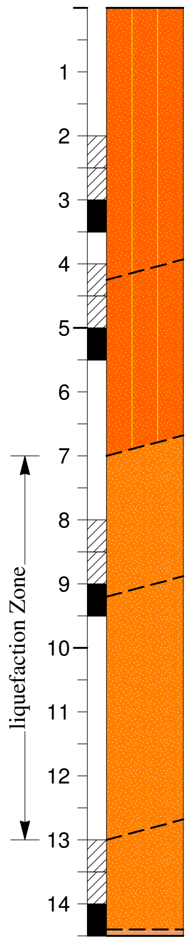
Log of Boring B- 2

Equipment: Mobile B-53; 6-inch solid-stem flight auger

Date: 1/23/19 **Logged By:** ZEM

Elevation: 136 feet *** **Latitude:** 39.232495 **Longitude:** -123.776026

Laboratory Tests	Sampler Type*	Moisture Content (%)	Dry Density (pcf)	Blows/foot	Depth (ft.)
Tx 1109 (720)	CA	23.6	83	4 **	3
	CA			9 **	5
0% Passing #200 3% Passing #200	CA			16 **	9
	CA			33/9" **	14



DARK BROWN SILTY SAND (SM)
very loose, damp
with rock fragments
porous with fine roots

ORANGE-BROWN SILTY SAND (SM)
loose, damp
with larger rock fragments

ORANGE-LIGHT BROWN POORLY GRADED SAND (SP)
medium dense, damp
occasional rock fragments

ORANGE-BROWN POORLY GRADED SAND (SP) with gravel
medium dense, moist

BROWN GRAVELLY SAND (SP)
dense, moist

ORANGE-BROWN SANDSTONE
crushed, moderately hard, moderate weathering

Notes:
1. No caving
2. No free water encountered
3. Practical drilling refusal at 14.5 feet

Latitude/Longitude estimated from Google Earth.
* See Soil Classification Chart & Key to Test Data
** Equivalent "Standard Penetration" Blow Counts.
*** Elevations interpolated from Plate 2.

Scale: 1" = 3'

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Santa Rosa, California 95403
Tel: (707) 528-6108

Job No.: 12613.03
Appr.: EEO
Date: 09/20/19

LOG OF BORING B- 2
PROPOSED SCHAFFER RESIDENCE, FAMILY CARE UNIT AND DRIVEWAY
3890 North Highway 1
Albion, California

PLATE 5
SHEET 1 of 1

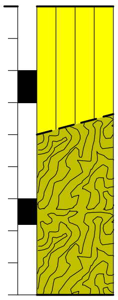
Log of Boring B- 3

Equipment: Mobile B-53; 6-inch solid-stem flight auger

Date: 1/23/19 **Logged By:** ZEM

Elevation: 154 feet *** **Latitude:** 39.231774 **Longitude:** -123.774144

Sampler Type*	Blows/foot	Depth (ft.)	Sample	Description
				DARK BROWN GRAVELLY SANDY SILT (ML) medium stiff to stiff, damp
CA	16/2" **	1		
		2		BROWN GRAYWACKE crushed, moderately hard, deeply weathered with minor shale fragments
CM	40 **	3		
		4		



Notes:
1. No caving
2. No free water encountered
3. Practical drilling refusal at 4.5 feet

Latitude/Longitude estimated from Google Earth.
* See Soil Classification Chart & Key to Test Data
** Equivalent "Standard Penetration" Blow Counts.
*** Elevations interpolated from Plate 2.

Scale: 1" = 3'

Brunsing Associates, Inc.
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Tel: (707) 528-6108

Job No.: 12613.03
Appr.: EEO
Date: 09/20/19

LOG OF BORING B- 3
PROPOSED SCHAFFER RESIDENCE,
FAMILY CARE UNIT AND DRIVEWAY
3890 North Highway 1
Albion, California

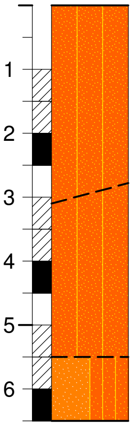
PLATE 6

Log of Boring B- 4

Equipment: Mobile B-53; 6-inch solid-stem flight auger

Date: 1/23/19 **Logged By:** ZEM

Elevation: 155 feet *** **Latitude:** 39.231227 **Longitude:** -123.773478



Sampler Type*	Blows/foot	Depth (ft.)	Description
		0	DARK BROWN SILTY SAND (SM) loose, damp porous, with roots
		1	
CA	5 **	2	
		3	ORANGE-BROWN SILTY SAND (SM) loose, damp
CA	6 **	4	
		5	
CA	12 **	6	BROWN-ORANGE SAND (SP-SM) with silt medium dense, damp

Notes:
1. No caving
2. No free water encountered

Latitude/Longitude estimated from Google Earth.
* See Soil Classification Chart & Key to Test Data
** Equivalent "Standard Penetration" Blow Counts.
*** Elevations interpolated from Plate 2.

Scale: 1" = 3'

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LOG OF BORING B- 4
PROPOSED SCHAFFER RESIDENCE,
FAMILY CARE UNIT AND DRIVEWAY
3890 North Highway 1
Albion, California

PLATE 7
SHEET 1 of 1

Log of Boring B- 5

Equipment: Deeprock DR8K: 4-inch solid-stem flight auger

Date: 1/22/19 **Logged By:** JAT

Elevation: 174 feet *** **Latitude:** 39.232773 **Longitude:** -123.774954

Laboratory Tests	Sampler Type*	Moisture Content (%)	Dry Density (pcf)	Blows/foot	Depth (ft.)	Description
					0	DARK BROWN-BLACK SILTY SAND (SM) loose, damp
					2.5	BROWN-ORANGE SILTY SAND (SM) loose, damp fine roots
	CA			4 **	3.5	
					4.5	ORANGE-BROWN SILTY SAND (SM) loose, damp
Tx 1674 (1152)	CA	11.7	97	8 **	6	
					6.5	YELLOW-ORANGE SILTY SAND (SM) medium dense, damp
14% Passing #200	CA			12 **	11	
					14	YELLOW-ORANGE SILTY SAND (SM) medium dense to dense, damp
	CA			29 **	16	
	CA			40 **	21	
					21	BROWN-ORANGE SAND (SP-SM) with silt dense, moist to wet occasional gravel

liquefaction Zone (approx. 9.5 to 14 ft.)

Latitude/Longitude estimated from Google Earth.
* See Soil Classification Chart & Key to Test Data
** Equivalent "Standard Penetration" Blow Counts.
*** Elevations interpolated from Plate 2.

Scale: 1" = 3'

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LOG OF BORING B- 5
PROPOSED SCHAFFER RESIDENCE,
FAMILY CARE UNIT AND DRIVEWAY
3890 North Highway 1
Albion, California

PLATE 8

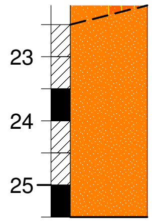
Log of Boring B- 5

Equipment: Deeprock DR8K: 4-inch solid-stem flight auger

Date: 1/22/19 **Logged By:** JAT

Elevation: 174 feet *** **Latitude:** 39.232773 **Longitude:** -123.774954

Laboratory Tests	Sampler Type*	Moisture Content (%)	Dry Density (pcf)	Blows/foot	Depth (ft.)
	CA			47 **	
	CA			60/9.5" **	25



YELLOW-BROWN SAND (SP)
dense to very dense, wet

Notes:
1. No caving
2. No free water encountered

Latitude/Longitude estimated from Google Earth.
* See Soil Classification Chart & Key to Test Data
** Equivalent "Standard Penetration" Blow Counts.
*** Elevations interpolated from Plate 2.

Scale: 1" = 3'

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LOG OF BORING B- 5
PROPOSED SCHAFFER RESIDENCE,
FAMILY CARE UNIT AND DRIVEWAY
3890 North Highway 1
Albion, California

PLATE 8

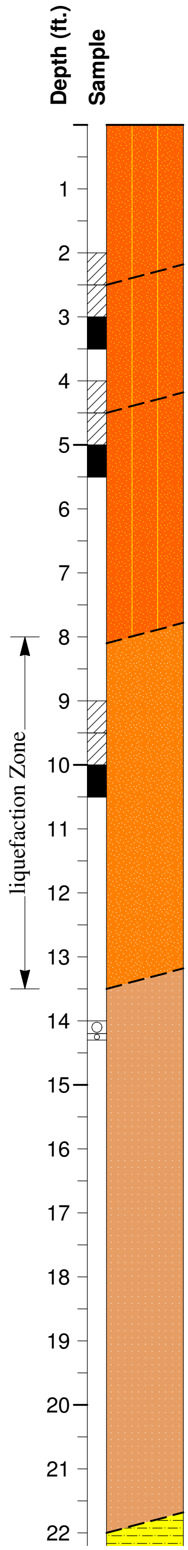
Log of Boring B- 6

Equipment: Deeprock DR8K: 4-inch solid-stem flight auger

Date: 1/22/19 **Logged By:** JAT

Elevation: 170 feet *** **Latitude:** 39.232476 **Longitude:** -123.77494

Laboratory Tests	Sampler Type*	Moisture Content (%)	Dry Density (pcf)	Blows/foot	Depth (ft.)	Description
					0	BLACK SILTY SAND (SM) loose, dry
Tx 1428 (720)	CA	15.7	95	5 **	3	RED-BROWN SILTY SAND (SM) loose, damp occasional gravel
	CA			8 **	5	ORANGE-BROWN SILTY SAND (SM) loose, moist
					8	ORANGE-BROWN POORLY GRADED SAND (SP) medium dense, moist
4% Passing #200	CA			16 **	10	
					13.5	YELLOW-BROWN SANDSTONE close fracturing, low to moderate hardness, moderate weathering
	CA CM			32/2" ** 40/1" **	14	



Latitude/Longitude estimated from Google Earth.
* See Soil Classification Chart & Key to Test Data
** Equivalent "Standard Penetration" Blow Counts.
*** Elevations interpolated from Plate 2.

Scale: 1" = 3'

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LOG OF BORING B- 6
PROPOSED SCHAFFER RESIDENCE, FAMILY CARE UNIT AND DRIVEWAY
3890 North Highway 1
Albion, California

PLATE 9
SHEET 1 of 2

Log of Boring B- 6

Equipment: Deeprock DR8K: 4-inch solid-stem flight auger

Date: 1/22/19 **Logged By:** JAT

Elevation: 170 feet *** **Latitude:** 39.232476 **Longitude:** -123.77494

Laboratory Tests	Sampler Type*	Moisture Content (%)	Dry Density (pcf)	Blows/foot	Depth (ft.)	Sample	Description
							ORANGE-BROWN SILTSTONE crushed, friable, deeply weathered
	CM			40/1" **	23		

Notes:
1. No caving
2. No free water encountered
3. Drilled to practical refusal

Latitude/Longitude estimated from Google Earth.
* See Soil Classification Chart & Key to Test Data
** Equivalent "Standard Penetration" Blow Counts.
*** Elevations interpolated from Plate 2.

Scale: 1" = 3'

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LOG OF BORING B- 6
PROPOSED SCHAFFER RESIDENCE,
FAMILY CARE UNIT AND DRIVEWAY
3890 North Highway 1
Albion, California

PLATE
9

Log of Boring B- 7

Equipment: Deeprock DR8K: 4-inch solid-stem flight auger

Date: 1/22/19 **Logged By:** JAT

Elevation: 155 feet *** **Latitude:** 39.23087 **Longitude:** -123.772465

Sampler Type*	Blows/foot	Depth (ft.)	Sample	Description
				DARK BROWN-BLACK SILTY SAND (SM) loose, damp
		1		
CA	32/3" **		■	ORANGE-BROWN SANDSTONE crushed to intensely fractured, low hardness, moderately weathered
		2		
	▽			
CM	40/5" **	3	■	

Notes:
1. No caving
2. Free water encountered at 2.5 feet

Latitude/Longitude estimated from Google Earth.
* See Soil Classification Chart & Key to Test Data
** Equivalent "Standard Penetration" Blow Counts.
*** Elevations interpolated from Plate 2.

Scale: 1" = 3'

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LOG OF BORING B- 7
PROPOSED SCHAFFER RESIDENCE,
FAMILY CARE UNIT AND DRIVEWAY
3890 North Highway 1
Albion, California

PLATE 10

SHEET 1 of 1

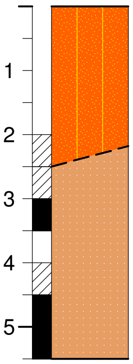
Log of Boring B- 8

Equipment: Deeprock DR8K: 4-inch solid-stem flight auger

Date: 1/22/19 **Logged By:** JAT

Elevation: 155 feet *** **Latitude:** 39.231211 **Longitude:** -123.771123

Sampler Type*	Blows/foot	Depth (ft.)	Description
		1	BROWN-BLACK SILTY SAND (SM) medium dense, saturated
		2	
CA	18 **	3	ORANGE-BROWN SILTY SANDSTONE intense fracturing, friable, deep weathering
		4	
CA	24 **	5	



Notes:
1. No caving
2. Free water encountered at 1 foot

Latitude/Longitude estimated from Google Earth.
* See Soil Classification Chart & Key to Test Data
** Equivalent "Standard Penetration" Blow Counts.
*** Elevations interpolated from Plate 2.

Scale: 1" = 3'

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LOG OF BORING B- 8
PROPOSED SCHAFFER RESIDENCE, FAMILY CARE UNIT AND DRIVEWAY
3890 North Highway 1
Albion, California

PLATE 11
SHEET 1 of 1

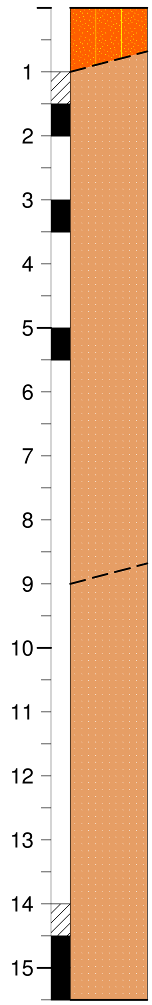
Log of Boring B- 9

Equipment: Deeprock DR8K: 4-inch solid-stem flight auger

Date: 1/22/19 **Logged By:** JAT

Elevation: 159 feet *** **Latitude:** 39.232118 **Longitude:** -123.774555

Sampler Type*	Blows/foot	Depth (ft.)	Description
		0	BROWN-BLACK SILTY SAND (SM) loose, damp
		1	BROWN-ORANGE SANDSTONE crushed, friable to low hardness, deeply weathered
CM	40/6" **	1.5	
CM	40/3" **	3	
CM	40/5.5" **	5	
		9	LIGHT YELLOW-BROWN SANDSTONE crushed, friable, deeply weathered
CM	54/11" **	15	



Notes:
1. No caving
2. No free water encountered

Latitude/Longitude estimated from Google Earth.
* See Soil Classification Chart & Key to Test Data
** Equivalent "Standard Penetration" Blow Counts.
*** Elevations interpolated from Plate 2.

Scale: 1" = 3'

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LOG OF BORING B- 9
PROPOSED SCHAFFER RESIDENCE,
FAMILY CARE UNIT AND DRIVEWAY
3890 North Highway 1
Albion, California

PLATE
12
SHEET 1 of 1

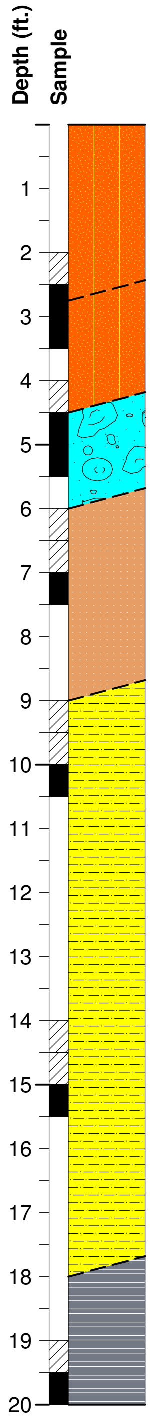
Log of Boring B-10

Equipment: Deeprock DR8K: 4-inch solid-stem flight auger

Date: 1/22/19 **Logged By:** JAT

Elevation: 188 feet *** **Latitude:** 39.232793 **Longitude:** -123.774662

Sampler Type*	Blows/foot	Depth (ft.)
CM	14 **	3
CM	34 **	5
CM	32 **	7
CM	38 **	10
CM	58 **	15
CM	40/5" **	19.5



BLACK SILTY SAND (SM)
loose, moist

ORANGE-BROWN SILTY SAND (SM)
medium dense, dry
occasional rock fragments

ORANGE-BROWN CONGLOMERATE
intensely fractured, low hardness, deeply weathered

BROWN SANDSTONE
crushed, low hardness, moderately weathered

ORANGE-BROWN SILTSTONE
intensely fractured, soft, deeply weathered

ORANGE-BLACK SHALE
crushed, low hardness, deeply weathered

Notes:
1. No caving
2. No free water encountered

Latitude/Longitude estimated from Google Earth.
* See Soil Classification Chart & Key to Test Data
** Equivalent "Standard Penetration" Blow Counts.
*** Elevations interpolated from Plate 2.

Scale: 1" = 3'

BORING LOG 1 PER PAGE, 12613.03 GINT.GPJ, 9/20/19

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LOG OF BORING B-10
PROPOSED SCHAFFER RESIDENCE, FAMILY CARE UNIT AND DRIVEWAY
3890 North Highway 1
Albion, California

PLATE 13

SHEET 1 of 1

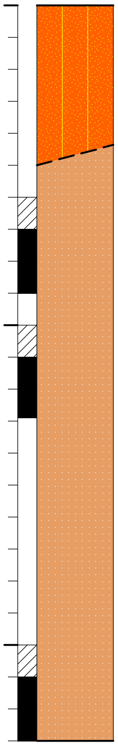
Log of Boring B-11

Equipment: Deeprock DR8K: 4-inch solid-stem flight auger

Date: 1/22/19 **Logged By:** JAT

Elevation: 185 feet *** **Latitude:** 39.232562 **Longitude:** -123.774624

Sampler Type*	Blows/foot	Depth (ft.)	Description
		0	BLACK SILTY SAND (SM) loose, damp
		1	
		2	
		3	ORANGE-BROWN-BLACK SANDSTONE crushed, friable to hardness, deeply weathered
CA	31 **	4	
		5	
CA	61/11" **	6	
		7	
		8	
		9	
		10	
CM	77/11" **	11	



Notes:
1. No caving
2. No free water encountered

Latitude/Longitude estimated from Google Earth.
* See Soil Classification Chart & Key to Test Data
** Equivalent "Standard Penetration" Blow Counts.
*** Elevations interpolated from Plate 2.

Scale: 1" = 3'

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LOG OF BORING B-11
PROPOSED SCHAFFER RESIDENCE,
FAMILY CARE UNIT AND DRIVEWAY
3890 North Highway 1
Albion, California

PLATE 14

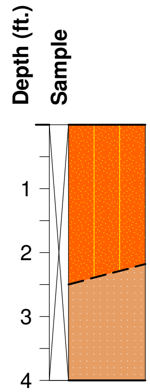
SHEET 1 of 1

Log of Boring B-12

Equipment: Deeprock DR8K: 4-inch solid-stem flight auger

Date: 1/22/19 **Logged By:** JAT

Elevation: 155 feet *** **Latitude:** 39.230895 **Longitude:** -123.772526



DARK BROWN-BLACK SILTY SAND (SM)
loose, wet to saturated

ORANGE-BROWN SILTY SANDSTONE
intense fracturing, friable, deep weathering

Notes:
1. No caving
2. No free water encountered

Latitude/Longitude estimated from Google Earth.

*** Elevations interpolated from Plate 2.

Scale: 1" = 3'

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LOG OF BORING B-12
PROPOSED SCHAFFER RESIDENCE, FAMILY CARE UNIT AND DRIVEWAY
3890 North Highway 1
Albion, California

PLATE 15

SHEET 1 of 1

UNIFIED SOIL CLASSIFICATION SYSTEM (USCS)

MAJOR DIVISIONS			SYMBOLS: GRAPHIC	SYMBOLS: LETTER	TYPICAL DESCRIPTIONS
COARSE-GRAINED SOILS MORE THAN 50% OF MATERIAL IS LARGER THAN NO. 200 SIEVE SIZE	GRAVELS AND GRAVELLY SOILS MORE THAN 50% OF COARSE FRACTION RETAINED ON NO. 4 SIEVE	CLEAN GRAVELS (Less than 5% fines)		GW	WELL-GRADED GRAVELS, GRAVEL-SAND MIXTURES, LITTLE OR NO FINES
				GP	POORLY-GRADED GRAVELS, GRAVEL-SAND MIXTURES, LITTLE OR NO FINES
		GRAVELS WITH FINES (Greater than 12% fines)		GM	SILTY GRAVELS, GRAVEL-SAND-SILT MIXTURES
				GC	CLAYEY GRAVELS, GRAVEL-SAND-CLAY MIXTURES
	SAND AND SANDY SOILS 50% OR MORE OF COARSE FRACTION PASSING THROUGH NO. 4 SIEVE	CLEAN SANDS (Less than 5% fines)		SW	WELL-GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES
				SP	POORLY-GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES
		SANDS WITH FINES (Greater than 12% fines)		SM	SILTY SANDS, SAND-SILT MIXTURES
				SC	CLAYEY SANDS, SAND-CLAY MIXTURES
FINE-GRAINED SOILS MORE THAN 50% OF MATERIAL IS SMALLER THAN NO. 200 SIEVE SIZE	SILTS AND CLAYS	LIQUID LIMIT LESS THAN 50		ML	INORGANIC SILTS AND VERY FINE SANDS, ROCK FLOUR, SILTY OR CLAYEY FINE SANDS OR CLAYEY SILTS WITH SLIGHT PLASTICITY
				CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS
				OL	ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY
	SILTS AND CLAYS	LIQUID LIMIT GREATER THAN 50		MH	INORGANIC SILT, MICACEOUS OR DIATOMACEOUS FINE SAND OR SILTY SOILS
				CH	INORGANIC CLAYS OF HIGH PLASTICITY
				OH	ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTS
HIGHLY ORGANIC SOILS				PT	PEAT, HUMOUS, SWAMP SOILS WITH HIGH ORGANIC CONTENTS

NOTE: DUAL SYMBOLS ARE USED TO INDICATE BORDERLINE SOIL CLASSIFICATIONS

KEY TO TEST DATA

LL - Liquid Limit
PI - Plasticity Index
■ Sample Retained
▨ Sample Recovered, Not Retained
☒ Bulk Sample
◯ Sample Not Recovered
CA - California Modified Split Barrel Sampler 3.0-inch O.D.
CM - California Modified Split Barrel Sampler 2.5-inch O.D.
SPT - California Split Barrel Sampler 2.0-inch O.D.
SH - Shelby Tube
RC - Rock Coring
Recovery - Percent Core Recovered
RQD - Rock Quality Designation (length of core pieces >= 4-inches / core length)

Consol - Consolidation
EI - Expansion Index
SA - Sieve Analysis

Shear Strength, psf **Confining Pressure, psf**

Tx	1564	(1440)	- Unconsolidated Undrained Triaxial
TxCU	1564	(1440)	- Consolidated Undrained Triaxial
DS	2020	(1440)	- Consolidated Drained Direct Shear
FVS	520		- Field Vane Shear
UC	1500		- Unconfined Compression
PP	1500		- Field Pocket Penetrometer
Sat			- Sample saturated prior to test

▽ Initial Groundwater Level Reading
▼ Second Groundwater Level Reading

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SOIL CLASSIFICATION CHART & KEY TO TEST DATA
PROPOSED SCHAFFER RESIDENCE, FAMILY CARE UNIT AND DRIVEWAY
3890 North Highway 1
Albion, California

PLATE 16

RELATIVE DENSITY OF COARSE-GRAINED SOILS

Relative Density	Standard Penetration Test Blow Count (blows per foot)
Very loose	4 or less
Loose	5 to 10
Medium dense	11 to 30
Dense	31 to 50
Very dense	More than 50

CONSISTENCY OF FINE-GRAINED SOILS

Consistency	Identification Procedure	Approximate Shear Strength (psf)
Very soft	Easily penetrated several inches with fist	Less than 250
Soft	Easily penetrated several inches with thumb	250 to 500
Medium stiff	Penetrated several inches by thumb with moderate effort	500 to 1000
Stiff	Readily indented by thumb, but penetrated only with great effort	1000 to 2000
Very stiff	Readily indented by thumb nail	2000 to 4000
Hard	indented with difficulty by thumb nail	More than 4000

NATURAL MOISTURE CONTENT

Dry	No noticeable moisture content. Requires considerable moisture to obtain optimum moisture content* for compaction.
Damp	Contains some moisture, but is on the dry side of optimum.
Moist	Near optimum moisture content for compaction.
Wet	Requires drying to obtain optimum moisture content for compaction.
Saturated	Near or below the water table, from capillarity, or from perched or ponded water. All void spaces filled with water.

* Optimum moisture content as determined in accordance with ASTM Test Method D1557, latest edition.

Where laboratory test data are not available, the above field classifications provide a general indication of material properties; the classifications may require modification based upon laboratory tests.

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SOIL DESCRIPTIVE PROPERTIES
PROPOSED SCHAFFER RESIDENCE,
FAMILY CARE UNIT AND DRIVEWAY
3890 North Highway 1
Albion, California

Generalized Graphic Bedrock Symbols

Claystone	Siltstone	Tuff (Volcanic Ash)
Shale	Chert	Andesite
Sandstone	Serpentine	Basalt
Conglomerate	Greenstone	Schist

Stratification

Bedding of Sedimentary Rocks	Thickness of Beds
Massive	No apparent bedding
Very thick bedded	Greater than 4 feet
Thick bedded	2 feet to 4 feet
Thin bedded	2 inches to 2 feet
Very thin bedded	0.5 inches to 2 inches
Laminated	0.125 inches to 0.5 inches
Thinly laminated	less than 0.125 inches

Fracturing

Fracturing Intensity	Fracture Spacing
Little	Greater than 4 feet
Occasional	1 foot to 4 feet
Moderate	6 inches to 1 foot
Close	1 inch to 6 inches
Intense	0.5 inches to 1 inch
Crushed	less than 0.5 inches

Strength

Soft	Plastic or very low strength.
Friable	Crumbles by hand.
Low hardness	Crumbles under light hammer blows.
Moderate hardness	Crumbles under a few heavy hammer blows.
Hard	Breaks into large pieces under heavy, ringing hammer blows.
Very hard	Resists heavy, ringing hammer blows and will yield with difficulty only dust and small flying fragments.

Weathering

Deep	Moderate to complete mineral decomposition, extensive disintegration, deep and thorough discoloration, many extensively coated fractures.
Moderate	Slight decomposition of minerals, little disintegration, moderate discoloration, moderately coated fractures.
Little	No megascopic decomposition of minerals, slight to no effect on cementation, slight and intermittent, or localized discoloration, few stains on fracture surfaces.
Fresh	Unaffected by weathering agents, no disintegration or discoloration, fractures usually less numerous than joints.

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BEDROCK DESCRIPTIVE PROPERTIES
PROPOSED SCHAFFER RESIDENCE,
FAMILY CARE UNIT AND DRIVEWAY
3890 North Highway 1
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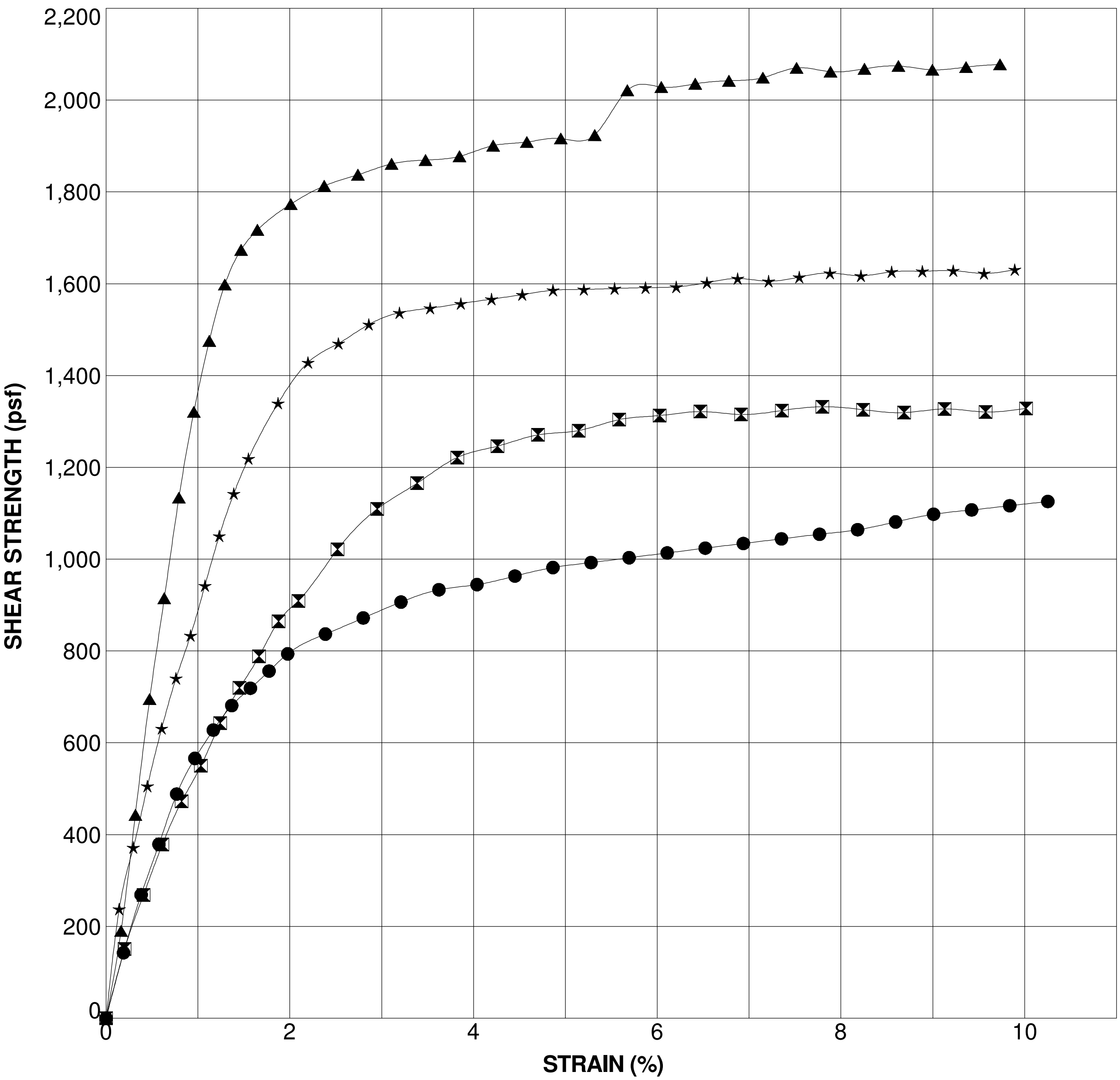
PLATE 18



Sample Source	Classification	Confining Pressure (psf)	Yield Strength (psf)	Strain (%)	Dry Density (pcf)	Moisture Content (%)
● B- 1 at 4 ft	ORANGE-BROWN SILTY SAND (SM)	864	794	2.0	95	17.7
⧗ B- 2 at 3 ft	DARK BROWN SILTY SAND (SM)	720	1109	3.0	83	23.6
▲ B- 5 at 6 ft	ORANGE-BROWN SILTY SAND (SM)	1152	1674	1.5	97	11.7
★ B- 6 at 3 ft	RED-BROWN SILTY SAND (SM)	720	1428	2.2	95	15.7

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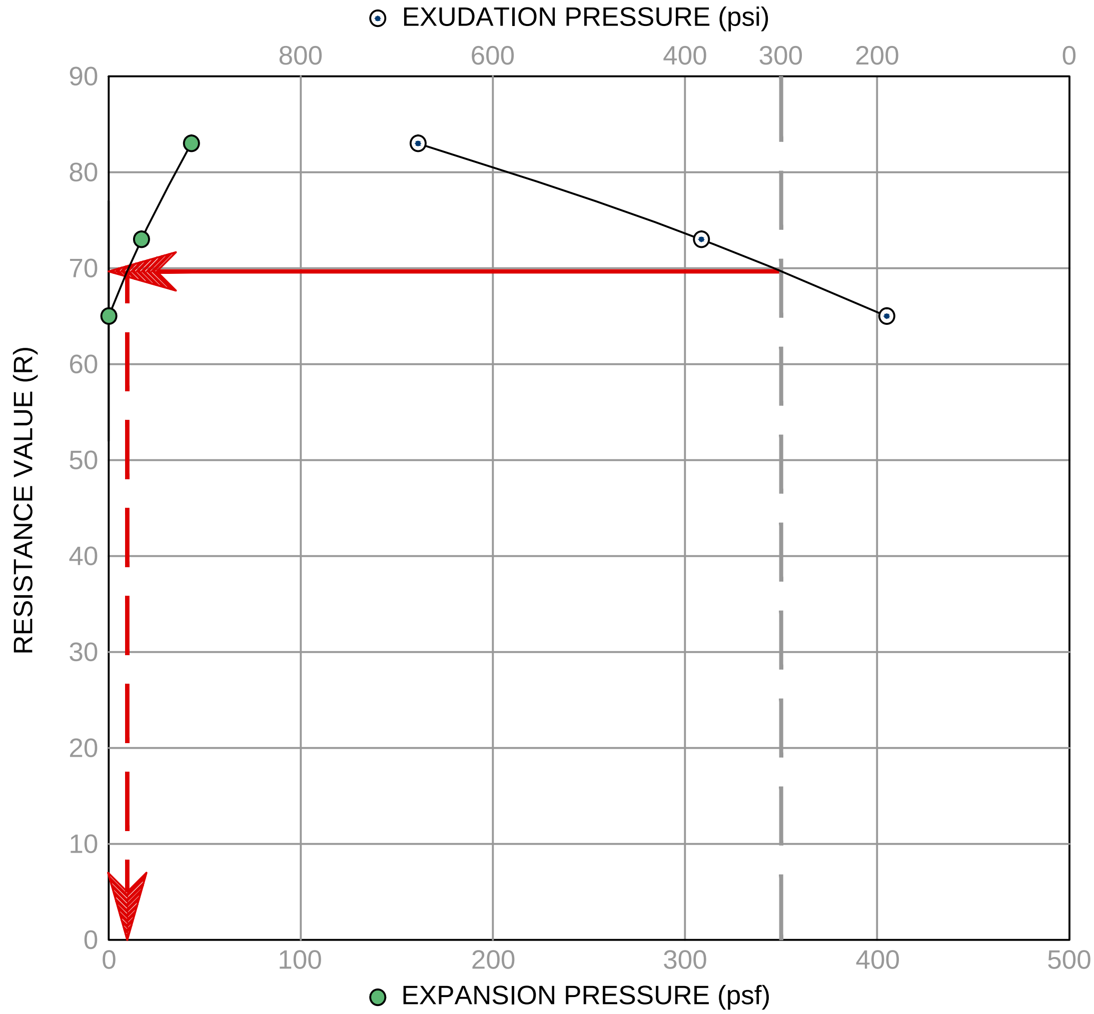
UNCONSOLIDATED UNDRAINED TRIAXIAL COMPRESSION TEST RESULTS

PROPOSED SCHAFFER RESIDENCE,
FAMILY CARE UNIT AND DRIVEWAY
3890 North Highway 1
Albion, California

PLATE
19



Specimen Number	A	B	C	D
Exudation Pressure (psi)	190	678	383	--
Moisture Content (%)	13.8	11.8	12.5	--
Dry Density (pcf)	116.2	120.9	118.8	--
Expansion Pressure (psf)	0	43	17	--
Resistance Value (R)	65	83	73	--

Sample Source	Classification	Sand Equivalent	Values at 300 psi Exudation: Expansion Pressure (psf)	Values at 300 psi Exudation: **R-Value**
B-12 at 0 to 4 feet	DARK BROWN SILTY SAND (SM) trace gravel	--	10	70

L:\Geotech Projects\12613.03 Schaffer\INVESTIGATION\GRAPHICS\12613.03_20 RESISTANCE (R-) VALUE TEST DATA.dwg

9/20/2019 11:40:50 AM save date
9/20/2019 11:41:08 AM plot date

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Santa Rosa, California 95403
Tel: (707) 528-6108

Job No.: 12613.03
Appr.: KAC
Date: 09/20/19

RESISTANCE VALUE TEST DATA
PROPOSED SCHAFFER RESIDENCE,
FAMILY CARE UNIT AND DRIVEWAY
3890 North Highway 1
Albion, California

PLATE
20

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Santa Rosa, California 95403
Tel: (707) 528-6108

Job No.: 12613.03
Appr.: EEO
Date: 09/20/19

SITE PHOTOGRAPH A
PROPOSED SCHAFFER RESIDENCE,
FAMILY CARE UNIT AND DRIVEWAY
3890 North Highway 1
Albion, California

PLATE
21

1979 COASTLINE OBLIQUE AERIAL PHOTOGRAPH

2005 COASTLINE OBLIQUE AERIAL PHOTOGRAPH

L:\Geotech Projects\12613.03 Schaffer\INVESTIGATION\GRAPHICS\12613.03_22 COASTLINE OBLIQUE AERAIL.dwg

9/20/2019 11:42:34 AM save date
9/20/2019 11:43:03 AM plot date

Reference:
California Coastal Records project, www.californiacoastline.org, by permission.

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Job No.: 12613.03
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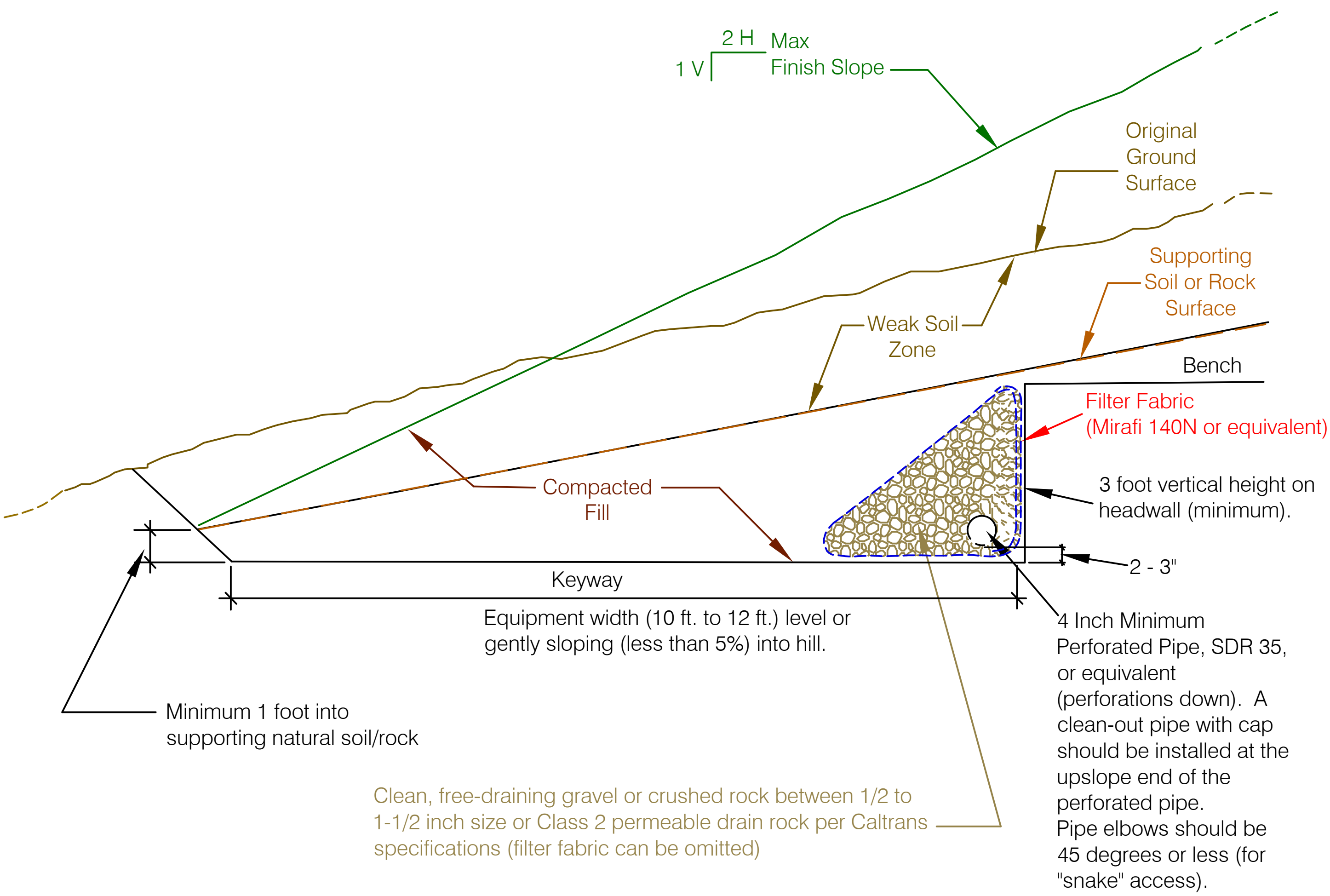
Date: 09/20/19

1979 and 2005 COASTLINE OBLIQUE AERIAL PHOTOGRAPHS
PROPOSED SCHAFFER RESIDENCE,
FAMILY CARE UNIT AND DRIVEWAY
3890 North Highway 1
Albion, California

PLATE
22

(NOT TO SCALE)



L:\Geotech Projects\12613.03 Schaffer\INVESTIGATION\GRAPHICS\12613.03_23 KEYWAY DRAINAGE DETAIL.dwg

9/20/2019 11:43:22 AM save date
9/20/2019 11:43:42 AM plot date

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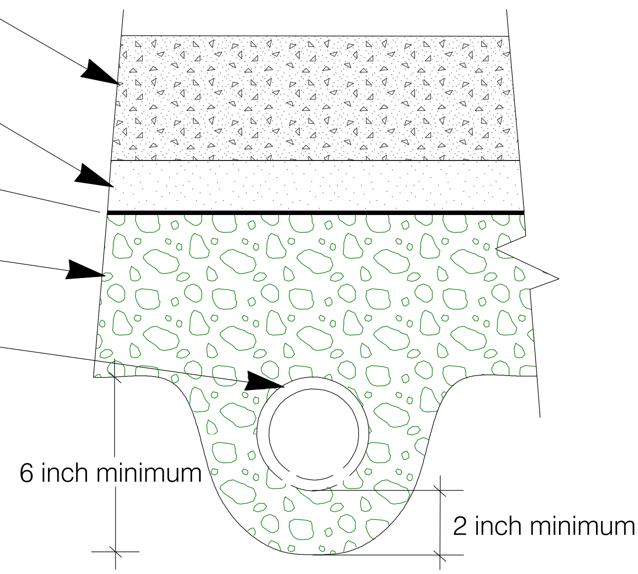
Job No.: 12613.03
Appr.: KAC
Date: 09/20/19

KEYWAY/BENCH DRAINAGE DETAIL

PROPOSED SCHAFFER RESIDENCE,
FAMILY CARE UNIT AND DRIVEWAY
3890 North Highway 1
Albion, California

PLATE
23



NOT TO SCALE

NOTES:

1. Drain rock should be clean, free-draining material graded in size between the No.4 and 3/4 inch sieves.
2. Pipe should be SDR 35 or equivalent, perforations placed down, sloped at least 1 percent to gravity outlet, or sump with automatic pump.
3. A clean-out pipe with cap should be installed at the up-slope end of perforated pipe.
4. Vapor retarder should be at least 15-mils thick and installed in accordance with the manufacturer's specifications.

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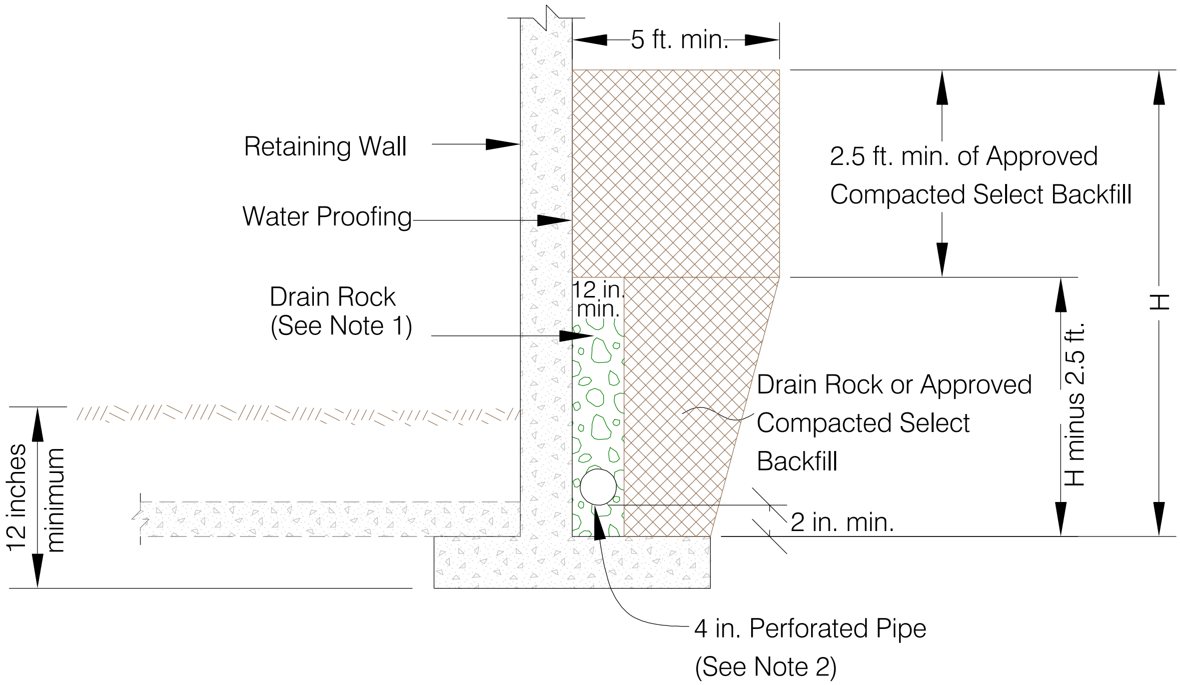
Job No.: 12613.03
Appr.: EEO
Date: 09/20/19

UNDERSLAB DRAINAGE DETAILS
PROPOSED SCHAFFER RESIDENCE,
FAMILY CARE UNIT AND DRIVEWAY
3890 North Highway 1
Albion, California

PLATE
24



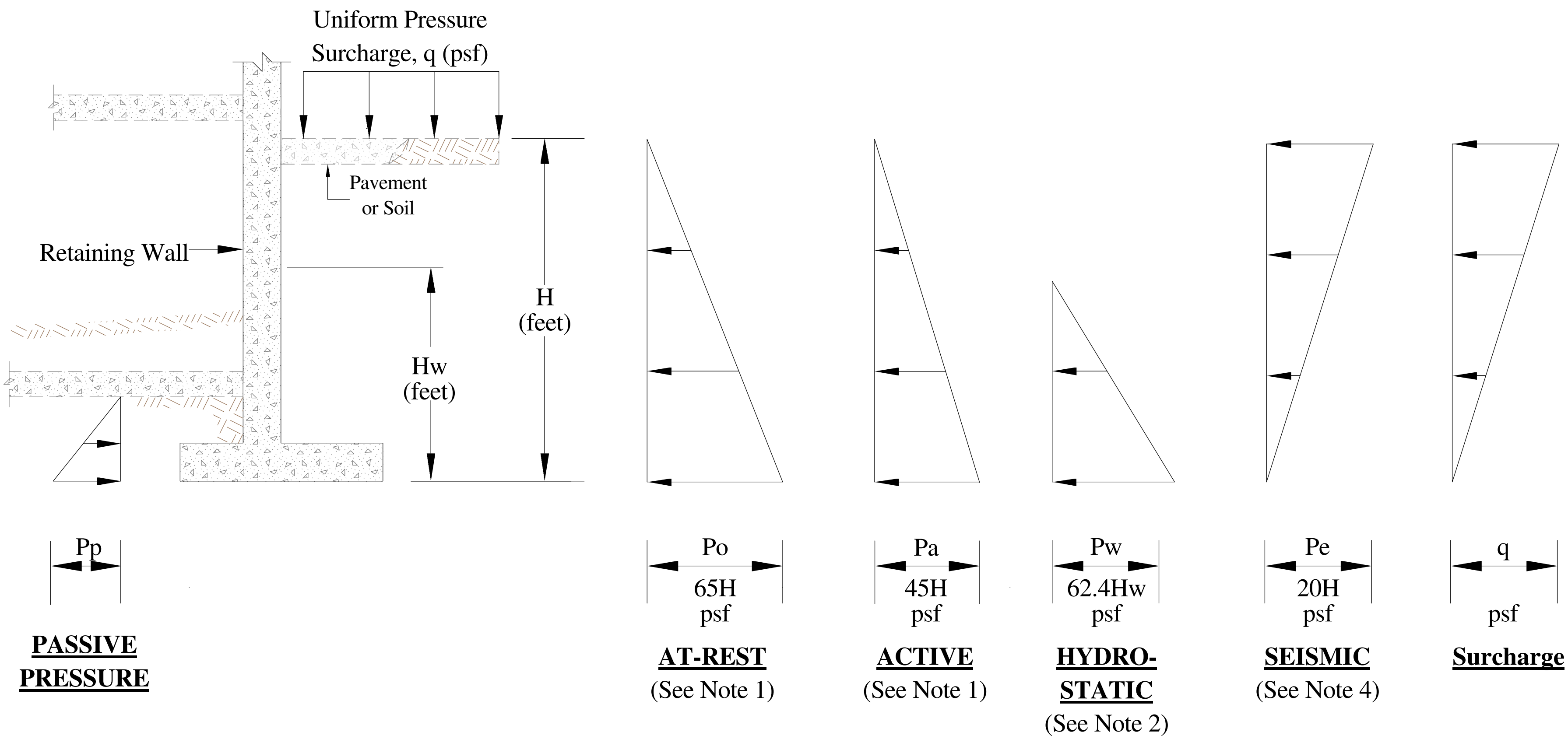
RETAINING WALL DRAINAGE DETAIL
(Not to Scale)

NOTES:

(1) Drain rock should be clean, free-draining material graded in size between the No. 4 and 3/4 inch sieves and should be wrapped in a non-woven geotextile filter fabric (Mirafi 140N or equivalent), or Class 2 permeable material, without filter fabric, per Caltrans standard specifications, latest edition.

(2) Pipe should be SDR 35 or equivalent, placed with perforations down, and sloped at 1 percent to drain to gravity outlet or sump with automatic pump.

(3) A clean-out pipe with cap should be installed at the up-slope end of perforated pipe, and pipe elbows should be 45 degrees or less (for "snake" access).



NOTES:

(1) If the wall at the surface of the backfill cannot move more than about 0.1 percent of its' height, at-rest soil pressures should be used.

(2) If the wall is drained the above hydrostatic pressure does not have to be used. See Plate 25 for drainage and backfill details.

(3) The above pressures should be used where backfill slope is flatter than 3 horizontal to 1 vertical (3H:1V). Where backfill slope is between 3H:1V and 1.5H:1V, use active pressure of 55H psf and at-rest pressure of 87H psf, respectively.

(4) For additional design seismic pressures see the Retaining Walls section of this report.

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Job No.: 12613.03
Appr.: EEO
Date: 09/20/19

RETAINING WALL LATERAL EARTH PRESSURES

PROPOSED SCHAFFER RESIDENCE,
FAMILY CARE UNIT AND DRIVEWAY
3890 North Highway 1
Albion, California

PLATE 26

APPENDIX A

References

- California Division of Mines and Geology, 1983, Geology and Geomorphic Features Related to Landsliding, Fort Bragg 7.5 Minute Quadrangle, Mendocino County, California, Open File Report (OFR) 83-5 SF.

- California Division of Mines and Geology with the Structural Engineers Association of California Seismology Committee, 1998, Maps of Active Fault Near-Source Zones in California and Adjacent Parts of Nevada: International Conference of Building Officials.

- California Division of Mines and Geology, 1960, Ukiah Sheet: Geologic Map of California.

- Dickinson, W. R., et. al., 2005, Net Dextral Slip, Neogene San Gregorio – Hosgri Fault Zone, Coastal California: Geologic Evidence and Tectonic Implications” Geological Society of America (GSA), Special Paper 391.

- Ted W. Trinkwalder and Ward L. Stover, The March 2011 Tsunami and its Impact on Crescent City Harbor, November/December 2011, Geo Strata.

APPENDIX B

Liquefaction Potential and Induced Vertical Settlement Calculations

Project:	Schaffer
Project #:	12613.03
Date:	9/20/2019
Boring:	B-1

Input Parameters:

Peak Ground Accel (g) =	0.667			
Earthquake Magnitude, M =	7.9			
Water Table Depth (m) =	3.0		(ft)	10.00
Average γ Above Water Table (kN/m^3) =		17.6	(lb/ft^3)	112
Average γ Below Water Table (kN/m^3) =		17.3	(lb/ft^3)	110
Borehole Diameter (mm) =	152.40		(in)	6
Requires Correction for Sample Liners (YES/NO):			no	
Rod Lengths Assumed Equal to the Depth Plus		1.5	m (for the above ground extension)	
Gravilty Acceleration (m/sec^2)		9.81		
Height of Exposed Face (m)		5	(ft)	16.5

Liquefaction Potential

SPT Sample Number	Depth (m)	Measured Depth (ft)	Measured N	Soil Type (USCS)	Flag "nlp"	Sat/Unsat	Fines Content (%)	Energy Ratio, ER (%)	C_E	C_B	C_R	C_S	N_{60}	σ_{vc} (kPa)	$\sigma_{vc'}$ (kPa)	C_N	$(N_1)_{60}$	ΔN for Fines Content	$(N_1)_{60\text{-}cs}$	Stress Reduct, Coeff, r_d	CSR	MSF_{max}	MSF for Sand	K_σ for Sand	CRR for M=7.5 & σ_{vc}'=1atm	CRR	Factor of Safety
1	0.91	3.00	4	ML		0	60	75	1.25	1.15	0.75	1.00	4.3	16	16	1.70	7.33	5.6	12.93	1.00	0.434	1.3	0.97	1.10	0.140	N.A.	N.A.
2	1.37	4.50	5	ML		0	60	75	1.25	1.15	0.75	1.00	5.4	24	24	1.70	9.16	5.6	14.77	1.00	0.433	1.3	0.96	1.10	0.154	N.A.	N.A.
3	2.13	7.00	7	SM		0	35	75	1.25	1.15	0.8	1.00	8.1	38	38	1.57	12.65	5.5	18.16	0.99	0.431	1.4	0.95	1.10	0.185	N.A.	N.A.
4	2.74	9.00	15	SM		0	25	75	1.25	1.15	0.85	1.00	18.3	48	48	1.31	24.07	5.1	29.15	0.99	0.429	1.9	0.88	1.10	0.436	N.A.	N.A.
5	4.27	14.00	24	SP		1	5	75	1.25	1.15	0.85	1.00	29.3	75	63	1.17	34.38	0.0	34.38	0.98	0.505	2.2	0.85	1.10	0.977	0.91	1.81
6	5.03	16.50	20	SP		1	5	75	1.25	1.15	0.95	1.00	27.3	88	68	1.15	31.35	0.0	31.35	0.97	0.541	2.1	0.86	1.08	0.584	0.55	1.01
7	5.49	18.00	32	Bedrock	nlp	1	25	75	1.25	1.15	0.95	1.00	43.7	96	72	1.09	N.A	N.A.	N.A.	0.97	0.560	--	--	1.10	N.A.	N.A.	N.A.

Liquefaction Potential

Liquefaction Induced Settlement and Lateral Spreading

Depth (m)	Depth (ft)	Limiting Shear Strain γ_{lim}	Parameter F_α	Maximum Shear Strain γ_{max}	ΔH_i (m)	ΔLDI_i (m)	ΔLDI_i (in)	Vertical Reconsol. Strain ε_v	ΔS_i (m)	ΔS_i (in)
0.91	3.00	0.344	0.832	0.000	0.91	0.000	0.0	0.000	0.000	0.00
1.37	4.50	0.282	0.764	0.000	0.46	0.000	0.0	0.000	0.000	0.00
2.13	7.00	0.195	0.612	0.000	0.76	0.000	0.0	0.000	0.000	0.00
2.74	9.00	0.052	-0.032	0.000	0.61	0.000	0.0	0.000	0.000	0.00
4.27	14.00	0.024	-0.391	0.004	1.52	0.007	0.3	0.001	0.000	-0.01
5.03	16.50	0.038	-0.180	0.034	0.76	0.026	1.0	0.007	-0.001	-0.05
5.49	18.00	0.000	0.000	0.000	0.46	0.000	0.0	0.000	0.000	0.00
					LDI=	0.03 (m)	1.3 (in)	S=	-0.001 (m)	-0.06 (in)

(1) Flag "nlp" – based on laboratory testing of fine content, plasticity index, liquid limits and potential intact moisture content.
"nlp" - no liquefacton potential

Project:	Schaffer
Project #:	12613.03
Date:	9/20/2019
Boring:	B-2

Input Parameters:

Peak Ground Accel (g) =	0.667		
Earthquake Magnitude, M =	7.9		
Water Table Depth (m) =	3.0	(ft)	10.00
Average γ Above Water Table (kN/m^3) =	16.2	(lb/ft^3)	103
Average γ Below Water Table (kN/m^3) =	17.3	(lb/ft^3)	110
Borehole Diameter (mm) =	152.40	(in)	6
Requires Correction for Sample Liners (YES/NO):		no	
Rod Lengths Assumed Equal to the Depth Plus	1.5	m (for the above ground extension)	
Gravity Acceleration (m/sec^2)	9.81		
Height of Exposed Face (m)	4	(ft)	14.5

Liquefaction Potential

SPT Sample Number	Depth (m)	Measured Depth (ft)	Measured N	Soil Type (USCS)	Flag "nlp"	Sat/Unsat	Fines Content (%)	Energy Ratio, ER (%)	C_E	C_B	C_R	C_S	N_{60}	σ_{vc} (kPa)	σ_{vc}' (kPa)	C_N	$(N_1)_{60}$	ΔN for Fines Content	$(N_1)_{60\text{-}cs}$	Stress Reduct, Coeff, r_d	CSR	MSF_{max}	MSF for Sand	K_σ for Sand	CRR for M=7.5 & σ_{vc}'=1atm	CRR	Factor of Safety
1	1.22	4.00	4	SM		0	25	75	1.25	1.15	0.75	1.00	4.3	20	20	1.70	7.33	5.1	12.40	1.00	0.433	1.2	0.97	1.10	0.135	N.A.	N.A.
2	2.13	7.00	9	SM		0	25	75	1.25	1.15	0.8	1.00	10.4	35	35	1.58	16.39	5.1	21.46	0.99	0.431	1.6	0.93	1.10	0.225	N.A.	N.A.
3	3.05	10.00	16	SP		1	0	75	1.25	1.15	0.85	1.00	19.6	49	49	1.33	25.91	0.0	25.91	0.99	0.428	1.8	0.90	1.10	0.313	0.31	0.73
4	3.96	13.00	16	SP		1	3	75	1.25	1.15	0.85	1.00	19.6	65	56	1.27	24.75	0.0	24.75	0.98	0.493	1.7	0.91	1.09	0.284	0.28	0.57
5	4.42	14.50	44	SP		1	10	75	1.25	1.15	0.85	1.00	53.8	73	60	1.15	61.78	1.1	62.92	0.98	0.519	2.2	0.85	1.10	2.000	1.87	2.00

Liquefaction Potential

Liquefaction Induced Settlement and Lateral Spreading

Depth (m)	Depth (ft)	Limiting Shear Strain γ_{lim}	Parameter F_α	Maximum Shear Strain γ_{max}	ΔH_i (m)	ΔLDI_i (m)	ΔLDI_i (in)	Vertical Reconsol. Strain ε_v	ΔS_i (m)	ΔS_i (in)
1.22	4.00	0.364	0.850	0.000	1.22	0.000	0.0	0.000	0.000	0.00
2.13	7.00	0.135	0.439	0.000	0.91	0.000	0.0	0.000	0.000	0.00
3.05	10.00	0.079	0.176	0.067	0.91	0.061	2.4	0.015	0.003	0.11
3.96	13.00	0.091	0.247	0.091	0.91	0.084	3.3	0.019	0.005	0.19
4.42	14.50	0.000	-2.675	0.000	0.46	0.000	0.0	0.000	0.000	0.00
					LDI=	0.14 (m)	5.7 (in)	S=	0.007 (m)	0.29 (in)

(1) Flag "nlp" – based on laboratory testing of fine content, plasticity index, liquid limits and potential intact moisture content.
"nlp" - no liquefacton potential

Project:	Schaffer
Project #:	12613.03
Date:	9/20/2019
Boring:	B-5

Input Parameters:

Peak Ground Accel (g) =	0.667			
Earthquake Magnitude, M =	7.9			
Water Table Depth (m) =	3.0		(ft)	10.00
Average γ Above Water Table (kN/m^3) =		17.0	(lb/ft^3)	108
Average γ Below Water Table (kN/m^3) =		18.1	(lb/ft^3)	115
Borehole Diameter (mm) =	101.60		(in)	4
Requires Correction for Sample Liners (YES/NO):			no	
Rod Lengths Assumed Equal to the Depth Plus		1.5	m (for the above ground extension)	
Gravity Acceleration (m/sec^2)		9.81		
Height of Exposed Face (m)		8	(ft)	25.5

Liquefaction Potential

SPT Sample Number	Depth (m)	Depth (ft)	Measured N	Soil Type (USCS)	Flag "nlp"	Sat/Unsat	Fines Content (%)	Energy Ratio, ER (%)	C_E	C_B	C_R	C_S	N_{60}	σ_{vc} (kPa)	σ_{vc}' (kPa)	C_N	$(N_1)_{60}$	ΔN for Fines Content	$(N_1)_{60-cs}$	Stress Reduct, Coeff, r_d	CSR	MSF_{max}	MSF for Sand	K_σ for Sand	CRR for M=7.5 & σ_{vc}'=1 atm	CRR	Factor of Safety
1	0.76	2.50	4	SM		0	30	75	1.25	1	0.75	1.00	3.8	13	13	1.70	6.38	5.4	11.74	1.00	0.434	1.2	0.97	1.10	0.131	N.A.	N.A.
2	1.37	4.50	4	SM		0	30	75	1.25	1	0.75	1.00	3.8	23	23	1.70	6.38	5.4	11.74	1.00	0.433	1.2	0.97	1.10	0.131	N.A.	N.A.
3	1.98	6.50	8	SM		0	30	75	1.25	1	0.8	1.00	8.0	34	34	1.65	13.17	5.4	18.54	0.99	0.431	1.4	0.94	1.10	0.189	N.A.	N.A.
4	2.90	9.50	10	SM		0	30	75	1.25	1	0.85	1.00	10.6	49	49	1.37	14.60	5.4	19.96	0.99	0.429	1.5	0.94	1.10	0.205	N.A.	N.A.
5	4.27	14.00	12	SM		1	14	75	1.25	1	0.85	1.00	12.8	74	62	1.25	15.91	2.9	18.82	0.98	0.506	1.4	0.94	1.06	0.192	0.19	0.38
6	6.10	20.00	29	SM		1	30	75	1.25	1	0.95	1.00	34.4	107	77	1.08	37.20	5.4	42.56	0.96	0.580	2.2	0.85	1.08	2.000	1.83	2.00
7	6.86	22.50	40	SP-SM		1	15	75	1.25	1	0.95	1.00	47.5	121	83	1.05	49.99	3.3	53.25	0.96	0.601	2.2	0.85	1.06	2.000	1.79	2.00
8	7.32	24.00	47	SP		1	10	75	1.25	1	0.95	1.00	55.8	129	87	1.04	58.06	1.1	59.21	0.95	0.611	2.2	0.85	1.04	2.000	1.77	2.00
9	7.77	25.50	60	SP		1	10	75	1.25	1	0.95	1.00	71.3	137	91	1.03	73.29	1.1	74.44	0.95	0.620	2.2	0.85	1.03	2.000	1.75	2.00

Liquefaction Potential

Liquefaction Induced Settlement and Lateral Spreading

Depth (m)	Depth (ft)	Limiting Shear Strain γ_{lim}	Parameter F_α	Maximum Shear Strain γ_{max}	ΔH_i (m)	ΔLDI_i (m)	ΔLDI_i (in)	Vertical Reconsol. Strain ε_v	ΔS_i (m)	ΔS_i (in)
0.76	2.50	0.391	0.870	0.000	0.76	0.000	0.0	0.000	0.000	0.00
1.37	4.50	0.391	0.870	0.000	0.61	0.000	0.0	0.000	0.000	0.00
1.98	6.50	0.187	0.593	0.000	0.61	0.000	0.0	0.000	0.000	0.00
2.90	9.50	0.160	0.520	0.000	0.91	0.000	0.0	0.000	0.000	0.00
4.27	14.00	0.181	0.579	0.181	1.37	0.249	9.8	0.024	0.014	0.55
6.10	20.00	0.005	-1.000	0.000	1.83	0.000	0.0	0.000	0.000	0.00
6.86	22.50	0.000	-1.856	0.000	0.76	0.000	0.0	0.000	0.000	0.00
7.32	24.00	0.000	-2.356	0.000	0.46	0.000	0.0	0.000	0.000	0.00
7.77	25.50	0.000	-3.692	0.000	0.46	0.000	0.0	0.000	0.000	0.00
					LDI=	0.25 (m)	9.8 (in)	S=	0.014 (m)	0.55 (in)

(1) Flag "nlp" – based on laboratory testing of fine content, plasticity index, liquid limits and potential intact moisture content.
"nlp" - no liquefacton potential

Project:	Schaffer
Project #:	12613.03
Date:	9/20/2019
Boring:	B-6

Input Parameters:

Peak Ground Accel (g) =	0.667			
Earthquake Magnitude, M =	7.9			
Water Table Depth (m) =	3.0		(ft)	10.00
Average γ Above Water Table (kN/m^3) =		17.3	(lb/ft^3)	110
Average γ Below Water Table (kN/m^3) =		18.1	(lb/ft^3)	115
Borehole Diameter (mm) =	101.60		(in)	4
Requires Correction for Sample Liners (YES/NO):			no	
Rod Lengths Assumed Equal to the Depth Plus		1.5	m (for the above ground extension)	
Gravilty Acceleration (m/sec^2)		9.81		
Height of Exposed Face (m)		4	(ft)	13.5

Liquefaction Potential

SPT Sample Number	Depth (m)	Measured Depth (ft)	Measured N	Soil Type (USCS)	Flag "nlp"	Sat/Unsat	Fines Content (%)	Energy Ratio, ER (%)	C_E	C_B	C_R	C_S	N_{60}	σ_{vc} (kPa)	σ_{vc}' (kPa)	C_N	$(N_1)_{60}$	ΔN for Fines Content	$(N_1)_{60\text{-}cs}$	Stress Reduct, Coeff, r_d	CSR	MSF_{max}	MSF for Sand	K_σ for Sand	CRR for M=7.5 & σ_{vc}'=1atm	CRR	Factor of Safety
1	0.76	2.50	5	SM		0	30	75	1.25	1	0.75	1.00	4.7	13	13	1.70	7.97	5.4	13.33	1.00	0.434	1.3	0.97	1.10	0.143	N.A.	N.A.
2	1.37	4.50	5	SM		0	30	75	1.25	1	0.75	1.00	4.7	24	24	1.70	7.97	5.4	13.33	1.00	0.433	1.3	0.97	1.10	0.143	N.A.	N.A.
3	2.44	8.00	8	SM		0	30	75	1.25	1	0.8	1.00	8.0	42	42	1.50	12.00	5.4	17.36	0.99	0.430	1.4	0.95	1.10	0.177	N.A.	N.A.
4	4.11	13.50	16	SM		1	4	75	1.25	1	0.85	1.00	17.0	72	61	1.24	21.06	0.0	21.06	0.98	0.497	1.5	0.93	1.07	0.220	0.22	0.44
5	6.55	21.50	50	sandstone		1	30	75	1.25	1	0.95	1.00	59.4	116	82	1.06	62.80	5.4	68.16	0.96	0.591	2.2	0.85	1.06	2.000	1.8	2.00
6	7.16	23.50	50	siltstone		1	60	75	1.25	1	0.95	1.00	59.4	127	87	1.04	61.82	5.6	67.42	0.95	0.606	2.2	0.85	1.05	2.000	1.77	2.00

Liquefaction Potential

Liquefaction Induced Settlement and Lateral Spreading

Depth (m)	Depth (ft)	Limiting Shear Strain γ_{lim}	Parameter F_α	Maximum Shear Strain γ_{max}	ΔH_i (m)	ΔLDI_i (m)	ΔLDI_i (in)	Vertical Reconsol. Strain ε_v	ΔS_i (m)	ΔS_i (in)
0.76	2.50	0.329	0.818	0.000	0.76	0.000	0.0	0.000	0.000	0.00
1.37	4.50	0.329	0.818	0.000	0.61	0.000	0.0	0.000	0.000	0.00
2.44	8.00	0.213	0.650	0.000	1.07	0.000	0.0	0.000	0.000	0.00
4.11	13.50	0.141	0.461	0.141	1.68	0.236	9.3	0.022	0.010	0.40
6.55	21.50	0.000	-3.132	0.000	2.44	0.000	0.0	0.000	0.000	0.00
7.16	23.50	0.000	-3.067	0.000	0.61	0.000	0.0	0.000	0.000	0.00
					LDI=	0.24	9.3	S=	0.010	0.40
						(m)	(in)		(m)	(in)

(1) Flag "nlp" – based on laboratory testing of fine content, plasticity index, liquid limits and potential intact moisture content.
"nlp" - no liquefacton potential

Project: Schaffer
Project #: 12613.03
Date: 9/20/2019
Boring: B-10

Input Parameters:

Peak Ground Accel (g) =	0.667			
Earthquake Magnitude, M =	7.9			
Water Table Depth (m) =	0.9		(ft)	3.00
Average γ Above Water Table (kN/m^3) =		17.6	(lb/ft^3)	112
Average γ Below Water Table (kN/m^3) =		20.4	(lb/ft^3)	130
Borehole Diameter (mm) =	101.60		(in)	4
Requires Correction for Sample Liners (YES/NO):			no	
Rod Lengths Assumed Equal to the Depth Plus		1.5	m (for the above ground extension)	
Gravilty Acceleration (m/sec^2)		9.81		
Height of Exposed Face (m)		1	(ft)	4.5

Liquefaction Potential

SPT Sample Number	Depth (m)	Measured Depth (ft)	Measured N	Soil Type (USCS)	Flag "nlp"	Sat/Unsat	Fines Content (%)	Energy Ratio, ER (%)	C_E	C_B	C_R	C_S	N_{60}	σ_{vc} (kPa)	σ_{vc}' (kPa)	C_N	$(N_1)_{60}$	ΔN for Fines Content	$(N_1)_{60-cs}$	Stress Reduct, Coeff, r_d	CSR	MSF_{max}	MSF for Sand	K_σ for Sand	CRR for M=7.5 & σ_{vc}'=1 atm	CRR	Factor of Safety
1	0.76	2.50	10	SM		0	25	75	1.25	1	0.75	1.00	9.4	13	13	1.70	15.94	5.1	21.01	1.00	0.434	1.5	0.93	1.10	0.219	N.A.	N.A.
2	1.37	4.50	14	SM		1	25	75	1.25	1	0.75	1.00	13.1	25	21	1.70	22.31	5.1	27.38	1.00	0.526	1.8	0.89	1.10	0.360	0.35	0.67
3	1.83	6.00	34	:onglomerate		1	25	75	1.25	1	0.8	1.00	34.0	35	26	1.43	48.69	5.1	53.76	1.00	0.582	2.2	0.85	1.10	2.000	1.87	2.00
4	2.74	9.00	32	sandstone		1	25	75	1.25	1	0.85	1.00	34.0	53	35	1.32	44.77	5.1	49.84	0.99	0.646	2.2	0.85	1.10	2.000	1.87	2.00
5	3.96	13.00	38	siltstone		1	60	75	1.25	1	0.85	1.00	40.4	78	48	1.21	48.99	5.6	54.59	0.98	0.688	2.2	0.85	1.10	2.000	1.87	2.00
6	5.49	18.00	58	siltstone		1	60	75	1.25	1	0.95	1.00	68.9	109	65	1.12	77.47	5.6	83.07	0.97	0.711	2.2	0.85	1.10	2.000	1.87	2.00
7	6.10	20.00	80	shale		1	25	75	1.25	1	0.95	1.00	95.0	122	71	1.10	104.20	5.1	109.27	0.96	0.716	2.2	0.85	1.10	2.000	1.87	2.00

Liquefaction Potential

Liquefaction Induced Settlement and Lateral Spreading

Depth (m)	Depth (ft)	Limiting Shear Strain γ_{lim}	Parameter F_α	Maximum Shear Strain γ_{max}	ΔH_i (m)	ΔLDI_i (m)	ΔLDI_i (in)	Vertical Reconsol. Strain ε_v	ΔS_i (m)	ΔS_i (in)
0.76	2.50	0.142	0.463	0.000	0.76	0.000	0.0	0.000	0.000	0.00
1.37	4.50	0.066	0.083	0.066	0.61	0.040	1.6	0.014	0.001	0.05
1.83	6.00	0.000	-1.898	0.000	0.46	0.000	0.0	0.000	0.000	0.00
2.74	9.00	0.000	-1.576	0.000	0.91	0.000	0.0	0.000	0.000	0.00
3.96	13.00	0.000	-1.967	0.000	1.22	0.000	0.0	0.000	0.000	0.00
5.49	18.00	0.000	-4.478	0.000	1.52	0.000	0.0	0.000	0.000	0.00
6.10	20.00	0.000	-6.961	0.000	0.61	0.000	0.0	0.000	0.000	0.00
					LDI=	0.04 (m)	1.6 (in)	S=	0.001 (m)	0.05 (in)

(1) Flag "nlp" – based on laboratory testing of fine content, plasticity index, liquid limits and potential intact moisture content.
"nlp" - no liquefacton potential

Project: Schaffer
Project #: 12613.03
Date: 9/20/2019
Boring: B-11

Input Parameters:

Peak Ground Accel (g) =	0.667			
Earthquake Magnitude, M =	7.9			
Water Table Depth (m) =	0.6		(ft)	2.00
Average γ Above Water Table (kN/m^3) =		17.6	(lb/ft^3)	112
Average γ Below Water Table (kN/m^3) =		20.4	(lb/ft^3)	130
Borehole Diameter (mm) =	101.60		(in)	4
Requires Correction for Sample Liners (YES/NO):			no	
Rod Lengths Assumed Equal to the Depth Plus		1.5	m (for the above ground extension)	
Gravilty Acceleration (m/sec^2)		9.81		
Height of Exposed Face (m)		1	(ft)	2.5

Liquefaction Potential

SPT Sample Number	Depth (m)	Measured Depth (ft)	Measured N	Soil Type (USCS)	Flag "nlp"	Sat/Unsat	Fines Content (%)	Energy Ratio, ER (%)	C_E	C_B	C_R	C_S	N_{60}	σ_{vc} (kPa)	σ_{vc}' (kPa)	C_N	$(N_1)_{60}$	ΔN for Fines Content	$(N_1)_{60-cs}$	Stress Reduct, Coeff, r_d	CSR	MSF_{max}	MSF for Sand	K_σ for Sand	CRR for M=7.5 & σ_{vc}'=1 atm	CRR	Factor of Safety
1	0.76	2.50	15	SM		1	25	75	1.25	1	0.75	1.00	14.1	14	12	1.70	23.91	5.1	28.98	1.00	0.487	1.9	0.88	1.10	0.428	0.42	0.85
2	1.52	5.00	31	sandstone		1	25	75	1.25	1	0.8	1.00	31.0	29	20	1.52	47.20	5.1	52.28	1.00	0.622	2.2	0.85	1.10	2.000	1.87	2.00
3	2.74	9.00	60	sandstone		1	25	75	1.25	1	0.85	1.00	63.8	54	33	1.34	85.32	5.1	90.39	0.99	0.698	2.2	0.85	1.10	2.000	1.87	2.00
4	3.51	11.50	70	sandstone		1	25	75	1.25	1	0.85	1.00	74.4	70	41	1.26	94.01	5.1	99.08	0.98	0.719	2.2	0.85	1.10	2.000	1.87	2.00

Liquefaction Potential

Liquefaction Induced Settlement and Lateral Spreading

Depth (m)	Depth (ft)	Limiting Shear Strain γ_{lim}	Parameter F_α	Maximum Shear Strain γ_{max}	ΔH_i (m)	ΔLDI_i (m)	ΔLDI_i (in)	Vertical Reconsol. Strain ε_v	ΔS_i (m)	ΔS_i (in)
0.76	2.50	0.053	-0.021	0.047	0.76	0.036	1.4	0.010	0.000	-0.01
1.52	5.00	0.000	-1.775	0.000	0.76	0.000	0.0	0.000	0.000	0.00
2.74	9.00	0.000	-5.158	0.000	1.22	0.000	0.0	0.000	0.000	0.00
3.51	11.50	0.000	-5.981	0.000	0.76	0.000	0.0	0.000	0.000	0.00
					LDI=	0.04	1.4	S=	0.000	-0.01
						(m)	(in)		(m)	(in)

(1) Flag "nlp" – based on laboratory testing of fine content, plasticity index, liquid limits and potential intact moisture content.
"nlp" - no liquefacton potential

DISTRIBUTION

One copy	Ken Schaffer 9301 Rocky Point Drive Kansas City, MO 64152
Four copies	Tara Jackson Wynn Coastal Planning, Inc. 703 North Main Street Fort Bragg, CA 95437
One Copy	Robert Schlosser Schlosser, Newberger Architects 435 North Main Street Fort Bragg, CA 95437

Attachment B to Memorandum

ATTACHMENT D

Lands of Schaffer
A division of a portion of Sections 20 & 21, Township 16 North, Range 17 West, Mount Diablo Base & Meridian
Mendocino County, CA

General Notes

General Plan Designation:	RMR:20
Zoning District:	RMR:20 *1C Bed and Breakfast or Inn up to 10 guest rooms, with Conditional Use Permit
Urban/Rural:	Rural
Highly Scenic Area:	Yes
Proposed Land Use:	SFR, Family Care Unit, Private Art Gallery, shift southern driveway encroachment to safer location, new driveway, room for 10- Unit Inn (Inn is not being proposed at this time), septic, supplemental well.
Appealable to Coastal Commission:	Yes
Entitlement Permit Type:	CDP
Yard Setbacks:	50' All sides
CalFire Setbacks:	30' All sides
Corridor Preservation Setback:	45'
Height Limit:	18'
Environmental Constraints:	Rare Plants, Rare Plant Community & Wetlands
Potential Geologic Hazards:	~50'
Landscaping:	Yes
Water Source:	On-site well
Wastewater Disposal:	On-site septic
Tree Removal:	No trees will be removed

CDP Lot Coverage Tabulation

Gross Site Area:	30.26 ac (1,318,125 sf)
Maximum allowable lot coverage:	10%

Lot Coverage:

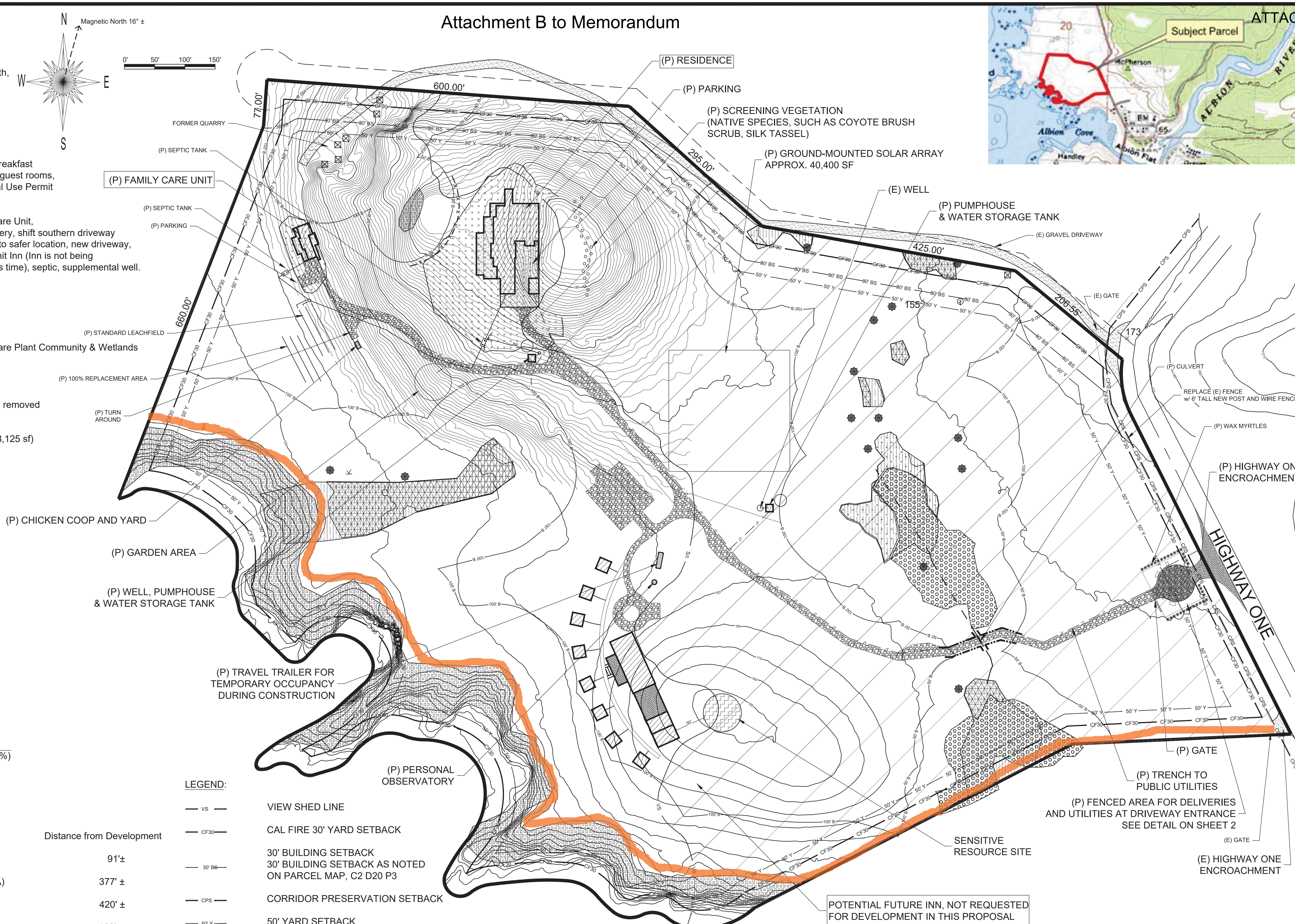
Residence:	5,164 sf
Gallery:	2,034 sf
Workshop:	419 sf
Garage:	612 sf
Covered Porches/Decks:	3,293 sf
Family Care Unit:	1,000 sf
Covered Porches/Decks:	1,299 sf
Chicken Coop:	822 sf
Personal Observatory:	44 sf
Total Building Footprint:	14,687 sf
Future Lodge:	3,000 sf
Future Covered Porches/Decks:	3,422 sf
Future Duplex:	1,862 sf
Future Cabins:	3,200 sf
Total Building Footprint:	11,484 sf
Total Building Footprint:	26,171 sf
Driveway & Parking:	34,462 sf
Future Driveway & Parking:	13,101 sf
Total Lot Coverage (Footprint):	73,734 sf (5.59%)

Landform Alteration:

Cut	350 C.Y.
Fill	430 C.Y.

Sensitive Resources:

Legend	Type	Distance from Development
	COASTAL BLUFF SCRUB (ESHA)	91'±
	TUFTED HAIRGRASS MEADOW (ESHA)	377' ±
	SHORE PINE FOREST (ESHA)	420' ±
	SLOUGH SEDGE SWARD (ESHA)	199' ±
	PRESUMED WETLAND (ESHA)	210' ±
	DECEIVING SEDGE (RARE PLANT)	351' ±
	HARLEQUIN LOTUS (RARE PLANT)	320' ±
	PYGMY CYPRESS (RARE PLANT)	698' ±
	SHORT LEAVED EVAX (RARE PLANT)	100' ±



LEGEND:

— VS —	VIEW SHED LINE
— CF30 —	CAL FIRE 30' YARD SETBACK
— 30' BS —	30' BUILDING SETBACK 30' BUILDING SETBACK AS NOTED ON PARCEL MAP, C2 D20 P3
— CPS —	CORRIDOR PRESERVATION SETBACK
— 50' Y —	50' YARD SETBACK
— # ' B —	BUFFER
— JT —	JOINT TRENCH
	STRAW WATTLES
— x — x —	ESA (ENVIRONMENTALLY SENSITIVE AREA) FENCE
	DITCH
	PUBLIC VIEWSHED
	(E) ROAD / DRIVEWAY
	(P) GRAVEL DRIVEWAY
	(P) ASPHALT DRIVEWAY
	(P) CONCRETE DRIVEWAY
	EXTENT OF GRADING

POTENTIAL FUTURE INN, NOT REQUESTED FOR DEVELOPMENT IN THIS PROPOSAL

- 3,000 S.F. MAIN LODGE
- DUPLEX UNITS
- (8) CABINS 400 S.F. EACH
- COURTYARD
- CART PATH
- PARKING LOT (16 SPACES)
- DELIVERIES, DROP OFF & ADA PARKING
- FENCE & GATE

Design review, not meant for construction. Topographic data processed by LiDAR, not results of Professional Land Surveyor data, verify data in field.

See sheet 2 for grading details.

SITE PLAN 1" = 80' 1

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Fort Bragg, California 95437
(707) 964-2537
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SCHAFFER
3980 N. Highway 1
Albion, CA 95410

APN: 123-030-09-00
DRAWN BY: TH
DATE: 6/11/2018
SCALE: AS SHOWN
APPROVED BY: AW

REVISION	BY	DATE
CORRECTED OSTONS	TH	7.19.18
SOLAR & FENCE	TH	6.12.19
ADDED (E) GATE, See HWY CORRECTED APPROACH	TH	7.6.20
CDP MODIFICATION	TH	9.17.20
CDP MODIFICATION	TH	1.27.21

SHEET 1 OF 3 SHEETS

ATTACHMENT E

Lands of Schaffer
A division of a portion of Sections 20 & 21, Township 16 North, Range 17 West, Mount Diablo Base & Meridian
Mendocino County, CA

General Notes

General Plan Designation:	RMR:20
Zoning District:	RMR:20 *1C Bed and Breakfast or Inn up to 10 guest rooms, with Conditional Use Permit
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Proposed Land Use:	SFR, Family Care Unit, Private Art Gallery, shift southern driveway encroachment to safer location, new driveway, room for 10- Unit Inn (Inn is not being proposed at this time), septic, supplemental well.
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Fill	430 C.Y.

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Legend	Type	Distance from Development
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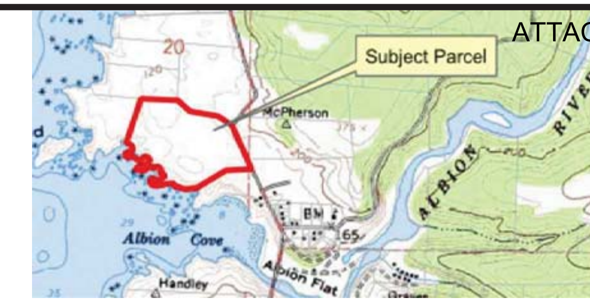
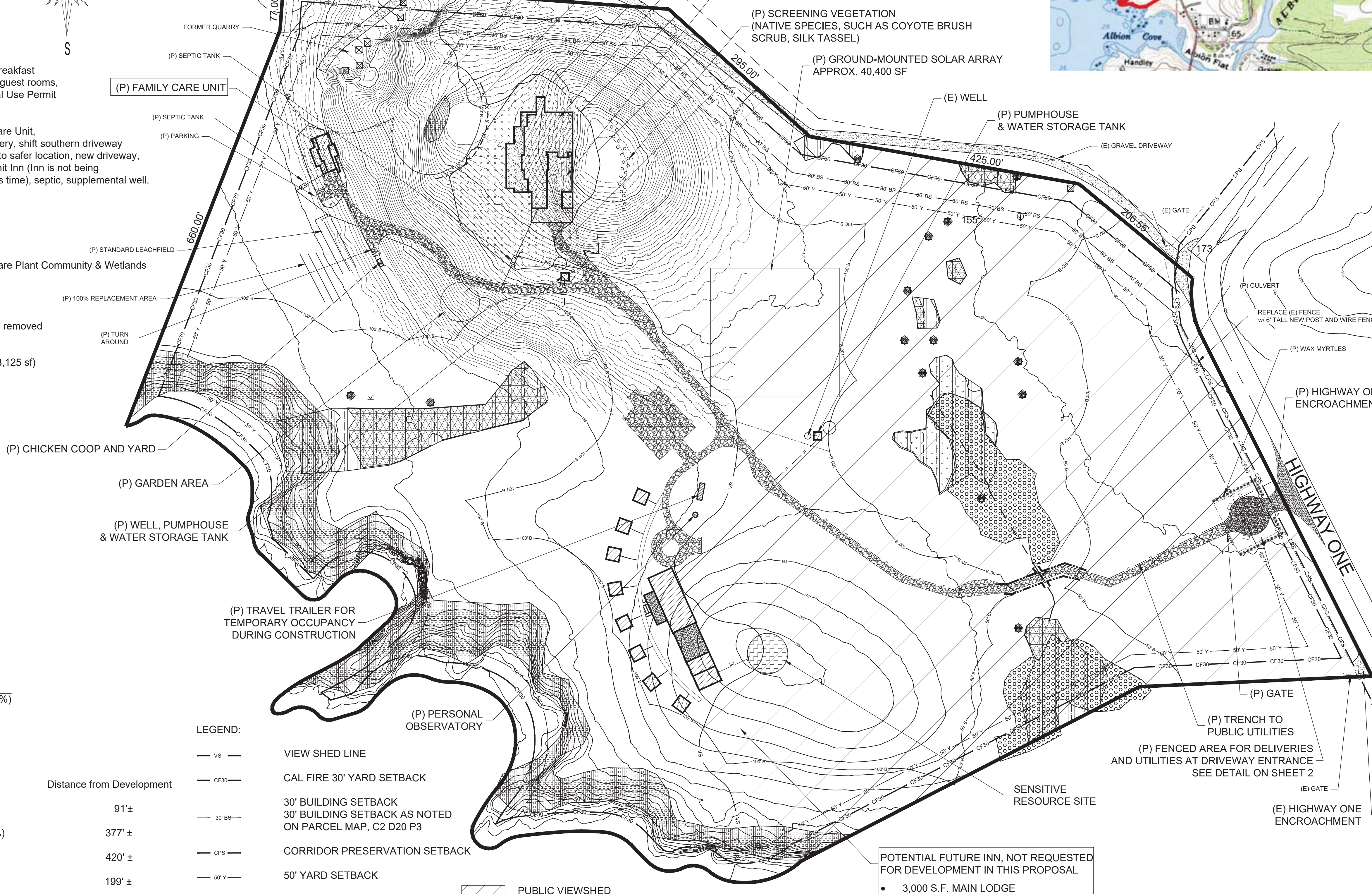
	SHORE PINE FOREST (ESHA)	420' ±
	SLOUGH SEDGE SWARD (ESHA)	199' ±
	PRESUMED WETLAND (ESHA)	210' ±
	DECEIVING SEDGE (RARE PLANT)	351' ±
	HARLEQUIN LOTUS (RARE PLANT)	320' ±
	PYGMY CYPRESS (RARE PLANT)	698' ±
	SHORT LEAVED EVAX (RARE PLANT)	100' ±





LEGEND:

VS	VIEW SHED LINE
CF30	CAL FIRE 30' YARD SETBACK
30' BS	30' BUILDING SETBACK 30' BUILDING SETBACK AS NOTED ON PARCEL MAP, C2 D20 P3
CPS	CORRIDOR PRESERVATION SETBACK
50' Y	50' YARD SETBACK
# ' B	BUFFER
JT	JOINT TRENCH
	STRAW WATTLES
x x	ESA (ENVIRONMENTALLY SENSITIVE AREA) FENCE
	DITCH
	PUBLIC VIEWSHED
	(E) ROAD / DRIVEWAY
	(P) GRAVEL DRIVEWAY
	(P) ASPHALT DRIVEWAY
	(P) CONCRETE DRIVEWAY
	EXTENT OF GRADING

POTENTIAL FUTURE INN, NOT REQUESTED FOR DEVELOPMENT IN THIS PROPOSAL

- 3,000 S.F. MAIN LODGE
- DUPLEX UNITS
- (8) CABINS 400 S.F. EACH
- COURTYARD
- CART PATH
- PARKING LOT (16 SPACES)
- DELIVERIES, DROP OFF & ADA PARKING
- FENCE & GATE

Design review, not meant for construction. Topographic data processed by LiDAR, not results of Professional Land Surveryor data, verify data in field.

See sheet 2 for grading details.

SITE PLAN | 1" = 80' | 1

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SCALE: AS SHOWN
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REVISION	BY	DATE
CORRECTED OSTONS	TH	7.19.18
SOLAR & FENCE	TH	6.12.19
ADDED GATE, S.W. HWY CORRECTED APPROACH	TH	7.6.20
CDP MODIFICATION	TH	9.17.20
CDP MODIFICATION	TH	1.27.21

SHEET 1 OF 3 SHEETS

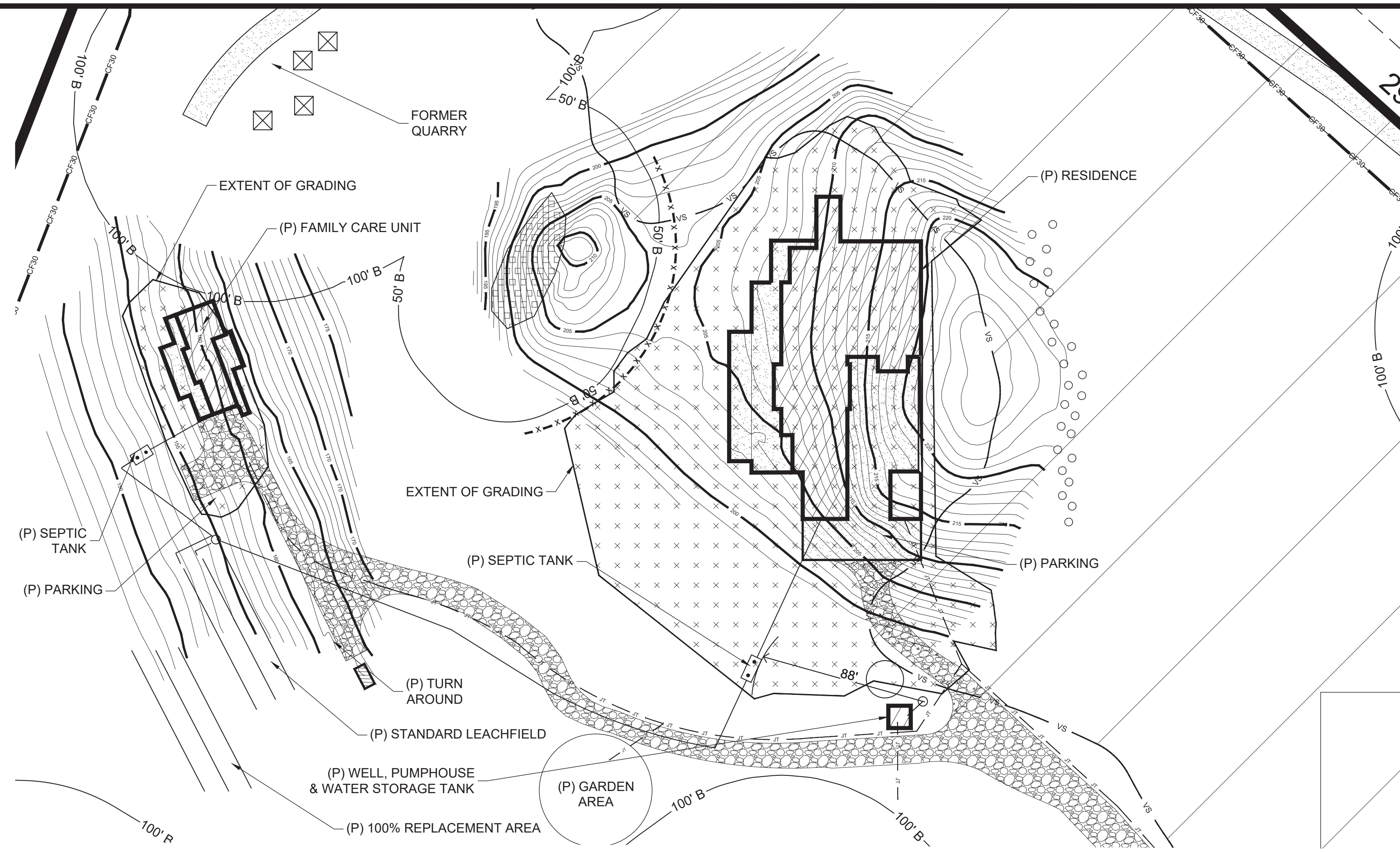
ATTACHMENT E

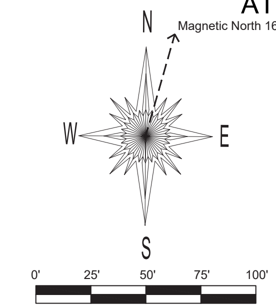
(P) CHICKEN COOP
145" (D) x 68" (W) x 67" (H)

(P) PERSONAL OBSERVATORY
89" Dia. x 89" (H)

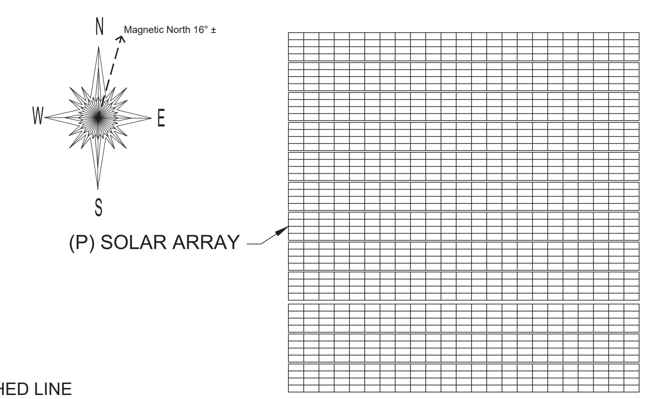
(P) FENCE

(P) SOLAR ARRAY

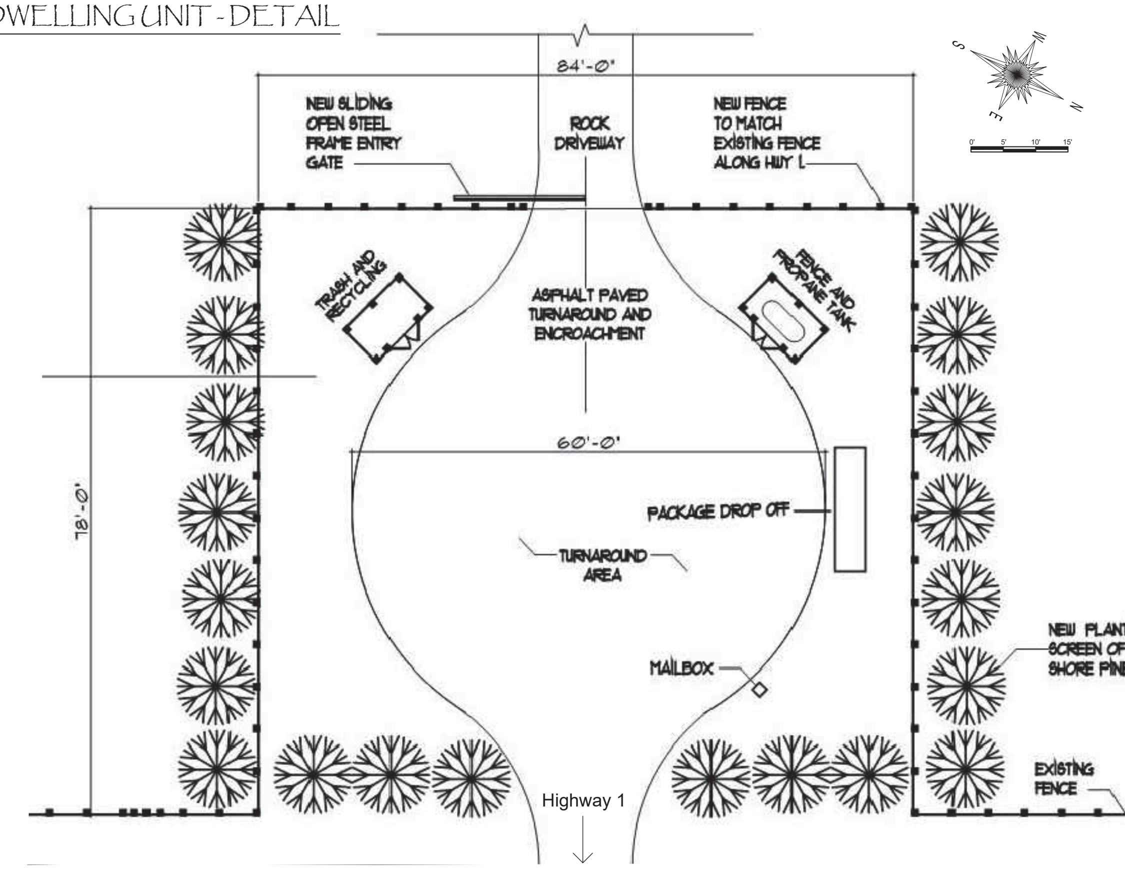




RESIDENCE AND FAMILY CARE UNIT/ACCESSORY DWELLING UNIT - DETAIL



(P) SOLAR ARRAY - PLAN VIEW
1:50



FENCED AREA FOR DELIVERIES AT ENTRANCE - DETAIL

Legend	Type	Distance from Development
	COASTAL BLUFF SCRUB (ESHA)	91'±
	TUFTED HAIRGRASS MEADOW (ESHA)	377' ±
	SHORE PINE FOREST (ESHA)	420' ±
	SLOUGH SEDGE SWARD (ESHA)	199' ±
	PRESUMED WETLAND (ESHA)	210' ±
	DECEIVING SEDGE (RARE PLANT)	351' ±
	HARLEQUIN LOTUS (RARE PLANT)	320' ±
	PYGMY CYPRESS (RARE PLANT)	698' ±
	SHORT LEAVED EVAX (RARE PLANT)	100' ±

LEGEND:

- VIEW SHED LINE
- CAL FIRE 30' YARD SETBACK
- 30' BUILDING SETBACK; 30' BUILDING SETBACK AS NOTED ON PARCEL MAP, C2 D20 P3
- CORRIDOR PRESERVATION SETBACK
- 50' YARD SETBACK
- BUFFER
- JOINT TRENCH
- STRAW WATTLES
- ESA (ENVIRONMENTALLY SENSITIVE AREA) FENCE
- DITCH
- PUBLIC VIEWSHED
- (E) ROAD / DRIVEWAY
- (P) GRAVEL DRIVEWAY
- (P) ASPHALT DRIVEWAY
- (P) CONCRETE DRIVEWAY
- EXTENT OF GRADING

SITE PLAN - DETAIL | 1 : 40 | 1

Partial Land Survey by:
Francis Land Surveyor
P.O. Box 1162
Mendocino, CA 95460
(707) 937-9900

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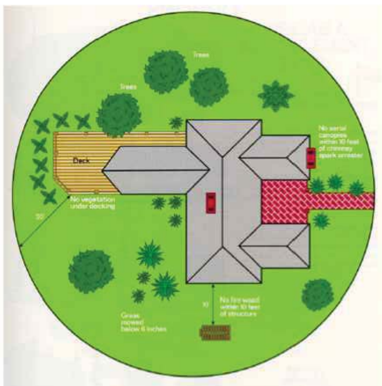
SOLAR & FENCE	TH	6.12.19
ADDED GATE, SHIFTED CORRECT APPROACH	TH	7.6.20
CDP MODIFICATION FOR REVIEW	TH	9.17.20
CDP MODIFICATION FOR CCC	TH	1.27.21

SHEET 2 OF 3 SHEETS

ATTACHMENT E



Title 14 Code of California Regulations: Division 1.5, Chapter 7, Subchapter 2, Article 5.
Fuel Modification and Defensible Space Standards

To reduce the intensity of a wildfire by reducing the volume and density of flammable vegetation, the strategic siting of fuel modification and greenbelts shall provide

1. increased safety for emergency fire equipment and evacuating civilians; and
2. a point of attack or defense from a wildfire.

Fuel Modification and Defensible Space Standards (implementation)

Structures on parcels 1 acre and larger shall be set back from the property line at least 30 feet. Smaller parcels shall provide for comparable mitigation.

Flammable waste generated by construction or development must be lawfully disposed of before final approval of a project.

Greenbelts that are proposed as a part of a development or project shall be strategically located to separate wildland fuels and structures.

DEFENSIBLE SPACE AROUND STRUCTURES

A person that owns, leases, controls, operates, or maintains a building or structure in, upon, or adjoining any mountainous area, forest-covered lands, brush-covered lands, grass-covered lands, or any land that is covered with flammable material, shall at all times do all of the following:

(a) Maintain around and adjacent to the building or structure a firebreak made by removing and clearing away, for a distance of not less than 30 feet on each side of the building or structure or to the property line, whichever is nearer, all flammable vegetation or other combustible growth. This subdivision does not apply to single specimens of trees or other vegetation that is well-pruned and maintained so as to effectively manage fuels and not form a means of rapidly transmitting fire from other nearby vegetation to any building or structure.

(b) Maintain around and adjacent to the building or structure additional fire protection or firebreak made by removing all brush, flammable vegetation, or combustible growth that is located within 100 feet from the building or structure or to the property line or at a greater distance if required by state law, or local ordinance, rule, or regulation. This section does not prevent an insurance company that insures a building or structure from requiring the owner of the building or structure to maintain a firebreak of more than 100 feet around the building or structure. Grass and other vegetation located more than 30 feet from the building or structure and less than 18 inches in height above the ground may be maintained where necessary to stabilize the soil and prevent erosion.

This subdivision does not apply to single specimens of trees or other vegetation that is well-pruned and maintained so as to effectively manage fuels and not form a means of rapidly transmitting fire from other nearby vegetation to a dwelling or structure.

(c) Remove that portion of any tree that extends within 10-feet of the outlet of a chimney or stovepipe.
(d) Maintain any tree adjacent to or overhanging a building free of dead or dying wood.
(e) Maintain the roof of a structure free of leaves, needles, or other dead vegetative growth.
(f) Provide and maintain at all times a screen over the outlet of every chimney or stovepipe that is attached to any fireplace, stove, or other device that burns any solid or liquid fuel. The screen shall be constructed of nonflammable material with openings of not more than one-half inch in size. (PRC 4291)

LEGEND:

CF30	CAL FIRE 30' YARD SETBACK
	(E) SHORE PINES
	(P) TREE REMOVAL & LIMBING

* NO TREES WILL BE REMOVED OR LIMBED

Wynn Coastal Planning, Inc.
703 N. Main Street
Fort Bragg, California 95437
(707) 964-2537
www.WCPlan.com

SCHAFFER

3980 N. Highway 1
Albion, CA 95410

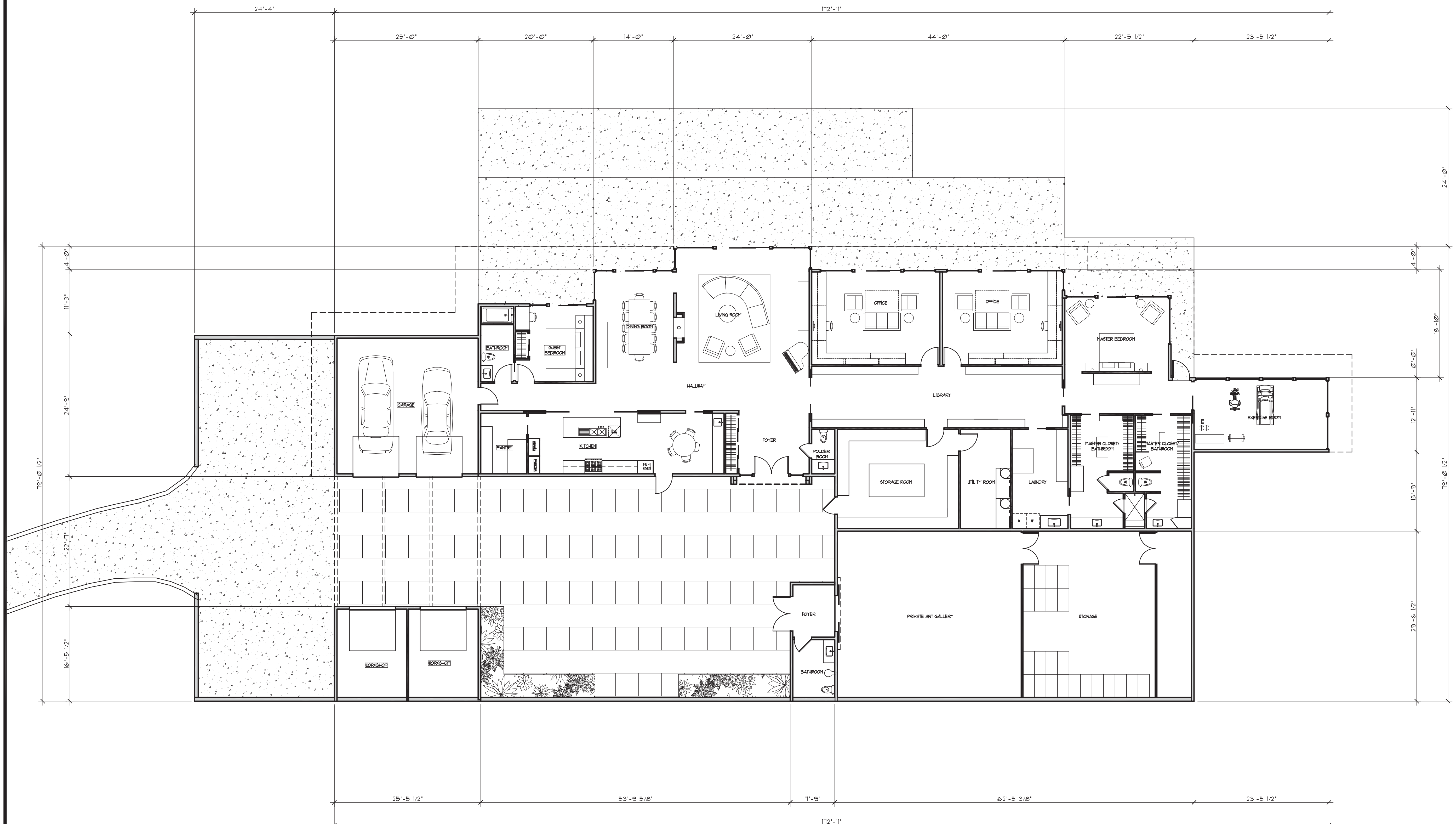
REVISION	BY	DATE
CORRECTED OSTOVS	TH	7.19.18
SOLAR & FENCE	TH	6.12.19
ADDED (E) GATES @ HWY. CORRECT RD. APPROACH	TH	7.6.20
CDP MODIFICATION: FCU TO GC	TH	9.17.20
CDP MODIFICATION: GC TO FCU	TH	1.27.21

APN: 123-030-09-00
DRAWN BY: TH
DATE: 6/11/2018
SCALE: AS SHOWN
APPROVED BY: AW

SHEET 3 OF 3 SHEETS

FIRE SAFE & BMP's PLAN | 1 : 80 | 1

ATTACHMENT E



NORTH

FLOOR PLAN

1/8" = 1'-0"

SCHLOSSER, NEWBERGER ARCHITECTS
ROBERT SCHLOSSER and TODD NEWBERGER
435 NORTH MAIN STREET FORT BRAGG, Ca. 95437
Phone (707) 961-0911 Fax (707)961-0912
www.lsndesign.com

RESIDENCE
FLOOR PLAN

NEW SINGLE FAMILY RESIDENCE FOR:
KEN and ROSWITHA
SCHAFFER
3890 NORTH HIGHWAY ONE
ALBION, CA 95410

ISSUE DATE
6-6-18
REVISIONS

LICENSED ARCHITECT
ROBERT SCHLOSSER
C-13301
4/30/2019
Renewal Date
STATE OF CALIFORNIA

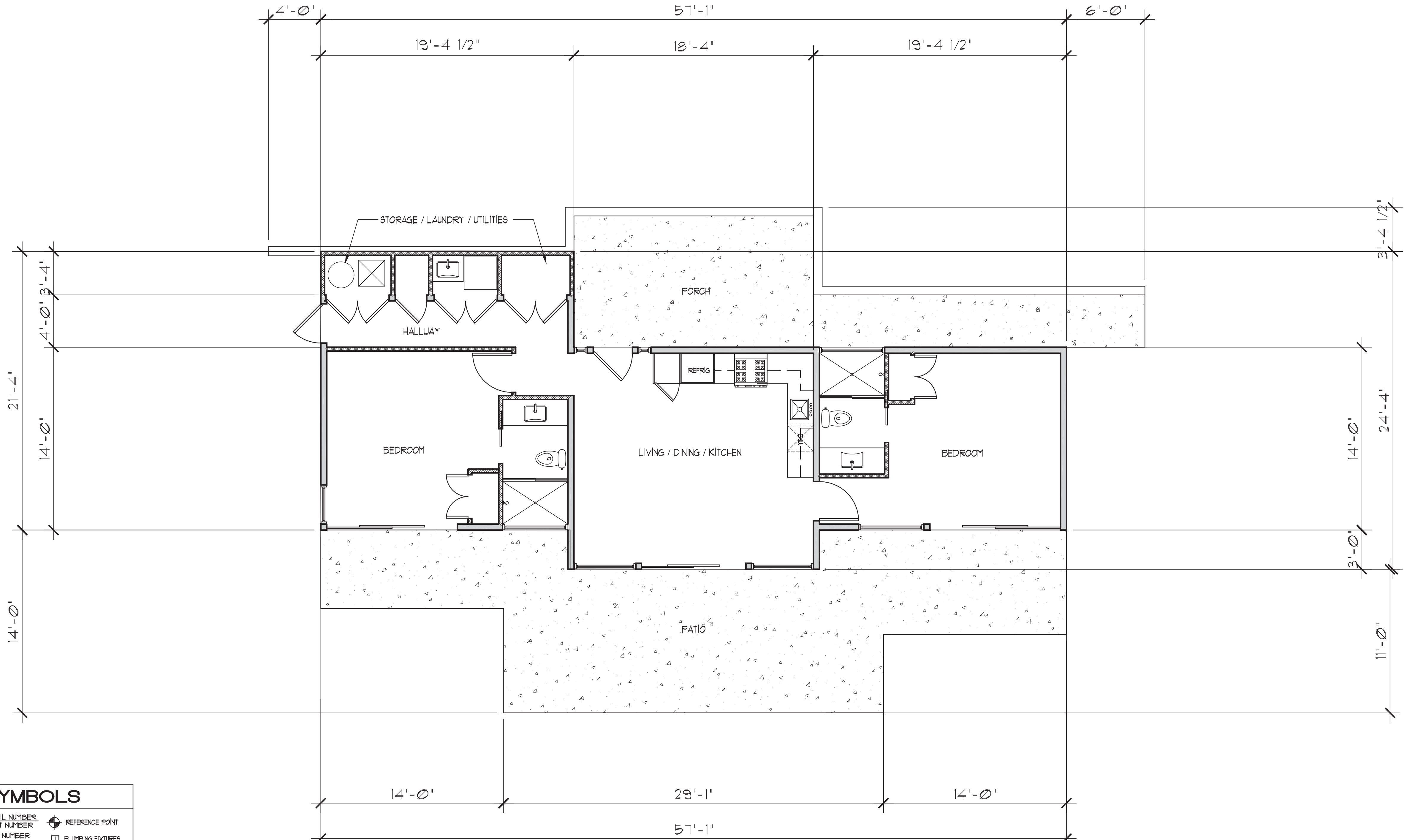
DRAWN

CHECKED

SCALE
AS NOTED

SHEET
A2.1
OF SHEETS

ATTACHMENT E



SYMBOLS

- DETAIL NUMBER / SHEET NUMBER
- NOTE NUMBER
- SECTION NUMBER / SHEET NUMBER
- ROOM NUMBER
- DOORS
- REFERENCE POINT
- PLUMBING FIXTURES
- APPLIANCES

WALL LEGEND

- 2X12 STUD WALLS
- 2X8 STUD WALLS
- 2X6 STUD WALLS
- 2X4 STUD WALLS

NORTH

FLOOR PLAN

1/4" = 1'-0"

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FAMILY CARE UNIT
FLOOR PLAN

NEW SINGLE FAMILY RESIDENCE FOR:
KEN and ROSWITHA
SCHAFFER
3890 NORTH HIGHWAY ONE
ALBION, CA 95410

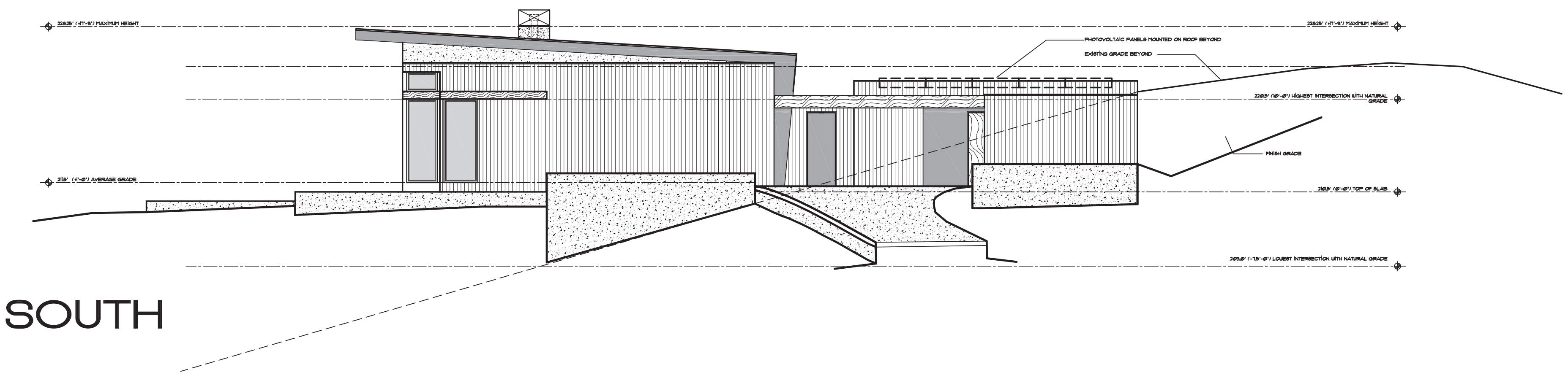
ISSUE DATE	5-21-18
REVISIONS	

LICENSED ARCHITECT
ROBERT SCHLOSSER
C-13301
4/30/2019
Renewal Date
STATE OF CALIFORNIA

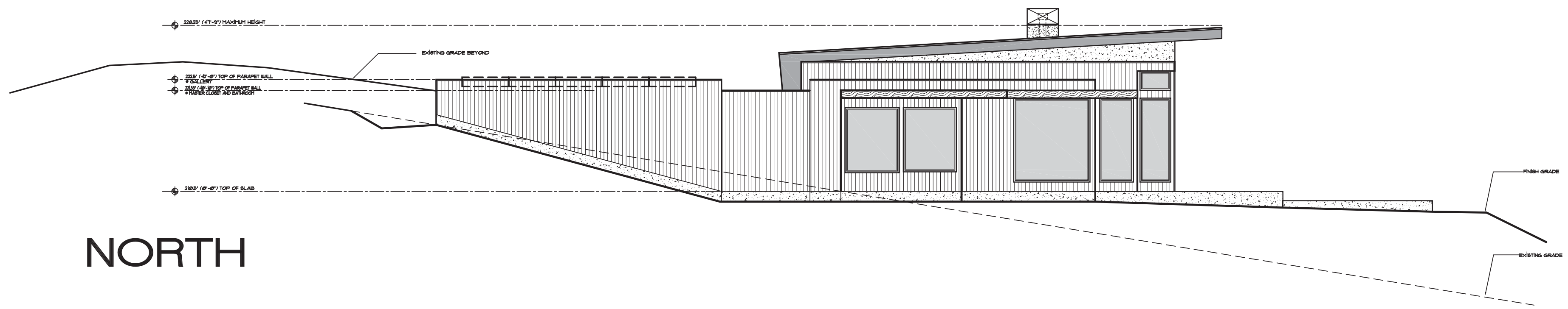
DRAWN	RS
CHECKED	RS
SCALE	AS NOTED
SHEET	A2.4

OF SHEETS

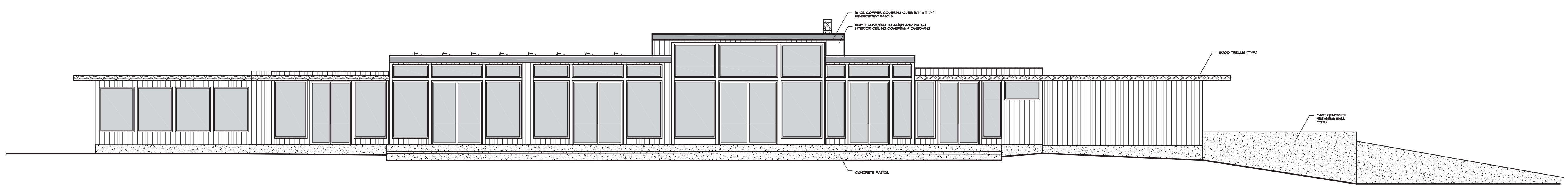
ATTACHMENT E



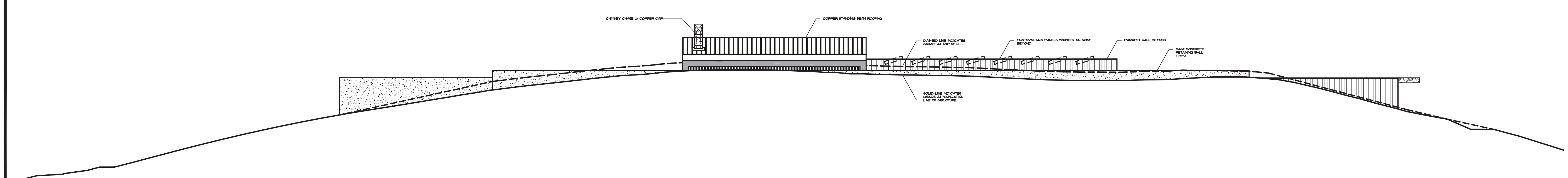
SOUTH



NORTH



WEST



EAST

EXTERIOR ELEVATIONS

1/8" = 1'-0"

EXTERIOR MATERIALS

METAL SIDING:	INSULATED METAL PANELS w/ BRONZE ANODIZED FINISH.
WOOD SIDING:	'A' CLEAR WESTERN RED CEDAR SIDING W/ CLEAR OIL FINISH
FIBERCEMENT SIDING:	SMOOTH 4X8 FIBERCEMENT SHEET SIDING PANELS PAINTED TO MATCH COLOR OF BRONZE ANODIZED SIDING AND ALUMINUM SASH
CASINGS:	'A' CLEAR WESTERN RED CEDAR, SEE ELEVATIONS FOR SIZES
TRIM:	'A' CLEAR WESTERN RED CEDAR, SEE ELEVATIONS FOR SIZES
SOFFITS:	CLEAR ALL HEART REDWOOD BOARDS WITH RESAWN TEXTURE
FASCIA:	'A' CLEAR WESTERN RED CEDAR, SEE ELEVATIONS FOR SIZES
TRELLIS POSTS:	'B' GRADE WESTERN RED CEDAR. SEE ELEVATIONS FOR SIZE
TRELLIS BEAMS AND PERLINS:	'B' GRADE WESTERN RED CEDAR. SEE ELEVATIONS FOR SIZE
EXTERIOR WOOD FINISH:	2 COATS "DUCKBACK" OR EQUAL CLEAR PENETRATING OIL FINISH
WINDOWS:	ALUMINUM SASH WITH BRONZE ANODIZED FINISH
SLIDING GLASS DOORS:	ALUMINUM SASH WITH BRONZE ANODIZED FINISH
MULLION COVERS:	ALUMINUM BREAKMETAL WITH BRONZE ANODIZED FINISH
EXTERIOR DOORS:	COPPER CLAD WOOD AND PAINTED FIBERGLASS
GARAGE DOORS:	'A' CLEAR WESTERN RED CEDAR SIDING, BLIND CUT TO MATCH WITH EXTERIOR SIDING MATERIAL AND PATTERN.
SLOPED ROOFING:	STANDING SEAM COPPER ROOFING.
FLAT ROOFING:	80 MIL PVC MEMBRANE ROOFING, WHITE COLOR.
FLASHING:	16 OZ. COPPER
GUTTERS:	16 OZ. COPPER
DOWN SPOUTS:	16 OZ. COPPER
CHIMNEY CAPS:	16 OZ. COPPER
CHIMNEY CHASE:	CEMENT PLASTER w/ PAINT FINISH
RETAINING WALLS:	CAST IN PLACE REINFORCED CONCRETE / INTEGRAL COLOR W/ BOARD FORMED FINISH AND NATURAL STONE CONTINUOUS WALL CAP.
WALKS AND PATIOS:	CAST IN PLACE REINFORCED CONCRETE / INTEGRAL COLOR WITH SALT FINISH
COURTYARD PAVING:	SMOOTH SQUARE NATURAL FLAGSTONE PAVERS
NAILING:	ALL EXPOSED NAILING TO BE STAINLESS RING SHANK TYPE

SCHLOSSER, NEWBERGER ARCHITECTS
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www.lsndesign.com

EXTERIOR ELEVATIONS RESIDENCE

NEW SINGLE FAMILY RESIDENCE FOR:
KEN and ROSWITHA SCHAFFER
3890 NORTH HIGHWAY ONE
ALBION, CA 95410

ISSUE DATE 5-22-18
REVISIONS

LICENSED ARCHITECT ROBERT SCHLOSSER C-13301 4/30/2019 Renewal Date STATE OF CALIFORNIA

DRAWN KG
CHECKED RS
SCALE AS NOTED
SHEET

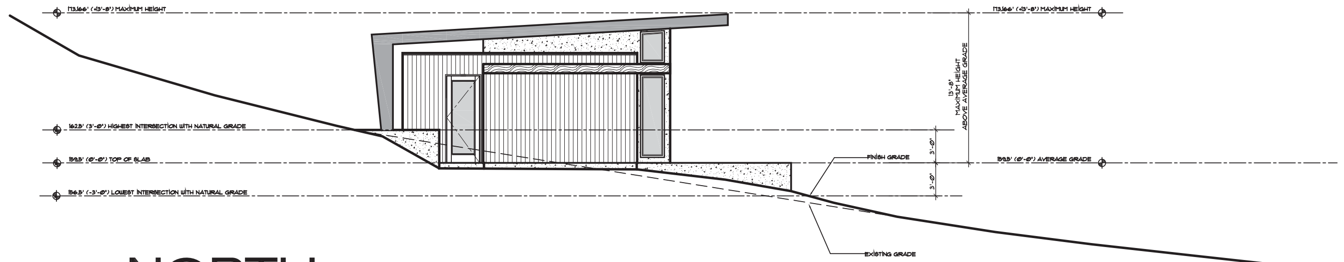
A3.1

OF SHEETS

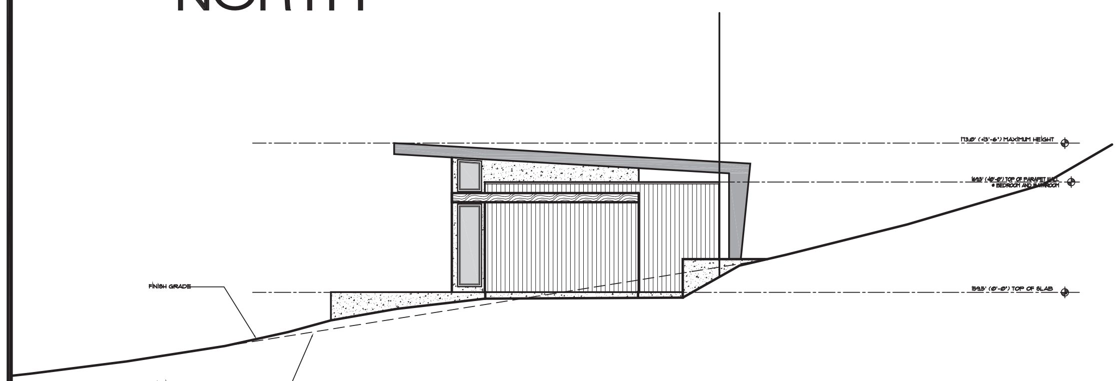
ATTACHMENT E

EXTERIOR MATERIALS

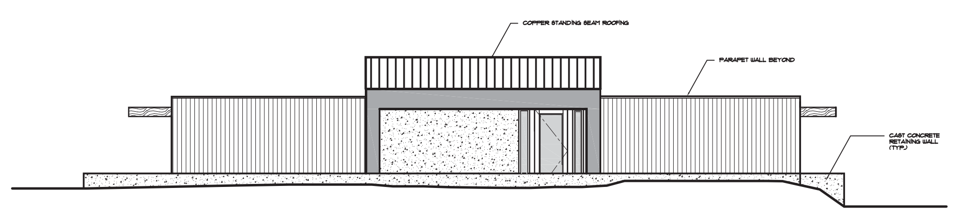
METAL SIDING:	INSULATED METAL PANELS w/ PAINT FINISH,
WOOD SIDING:	'A' CLEAR WESTERN RED CEDAR VERTICAL T&G SIDING W/ CLEAR OIL FINISH
CASINGS:	'A' CLEAR WESTERN RED CEDAR, SEE ELEVATIONS FOR SIZES
TRIM:	'A' CLEAR WESTERN RED CEDAR, SEE ELEVATIONS FOR SIZES
FASCIA:	'A' CLEAR WESTERN RED CEDAR, SEE ELEVATIONS FOR SIZES
TRELLIS POSTS:	'B' GRADE WESTERN RED CEDAR. SEE ELEVATIONS FOR SIZE
TRELLIS BEAMS AND PERLINS:	'B' GRADE WESTERN RED CEDAR. SEE ELEVATIONS FOR SIZE
EXTERIOR WOOD FINISH:	2 COATS "DUCKBACK" OR EQUAL CLEAR PENETRATING OIL FINISH
WINDOWS:	ALUMINUM SASH WITH BRONZE ANODIZED FINISH
SLIDING GLASS DOORS:	ALUMINUM SASH WITH BRONZE ANODIZED FINISH
EXTERIOR DOORS:	COPPER CLAD WOOD AND PAINTED FIBERGLASS
SLOPED ROOFING:	STANDING SEAM COPPER ROOFING.
FLAT ROOFING:	80 MIL PVC MEMBRANE ROOFING, WHITE COLOR.
FLASHING:	16 OZ. COPPER
GUTTERS:	16 OZ. COPPER
DOWN SPOUTS:	16 OZ. COPPER
CHIMNEY CAPS:	16 OZ. COPPER
CHIMNEY:	CEMENT PLASTER w/ PAINT FINISH
RETAINING WALLS:	CAST IN PLACE REINFORCED CONCRETE / INTEGRAL COLOR W/ BOARD FORMED FINISH
WALKS AND PATIOS:	CAST IN PLACE REINFORCED CONCRETE / INTEGRAL COLOR WITH SALT FINISH
NAILING:	ALL EXPOSED NAILING TO BE STAINLESS RING SHANK TYPE



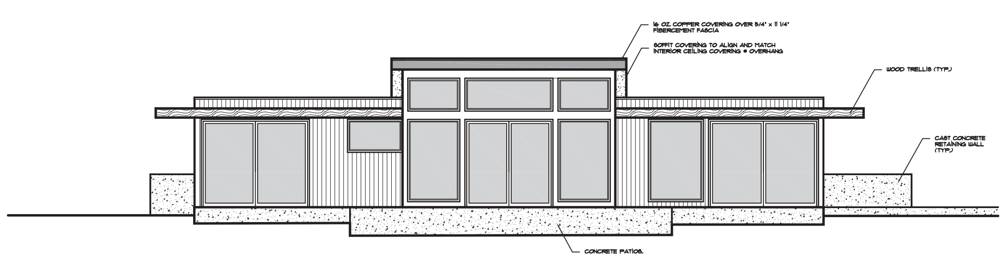
NORTH



SOUTH



EAST



WEST

EXTERIOR ELEVATIONS

1/8" = 1'-0"

SCHLOSSER, NEWBERGER ARCHITECTS
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EXTERIOR ELEVATIONS FAMILY CARE UNIT

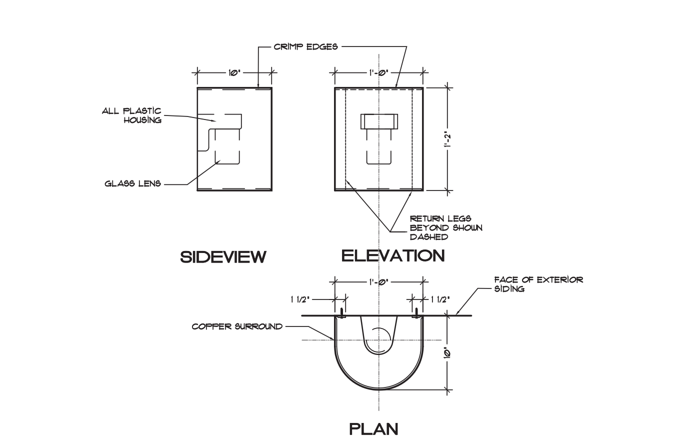
NEW SINGLE FAMILY RESIDENCE FOR:
KEN and ROSWITHA SCHAFFER
3890 NORTH HIGHWAY ONE
ALBION, CA 95410

ISSUE DATE: 5-21-18
REVISIONS

LICENSED ARCHITECT ROBERT SCHLOSSER C-13301 4/30/2019 Renewal Date STATE OF CALIFORNIA

DRAWN: RS
CHECKED:
SCALE: AS NOTED
SHEET: A3.2
OF SHEETS

ATTACHMENT E

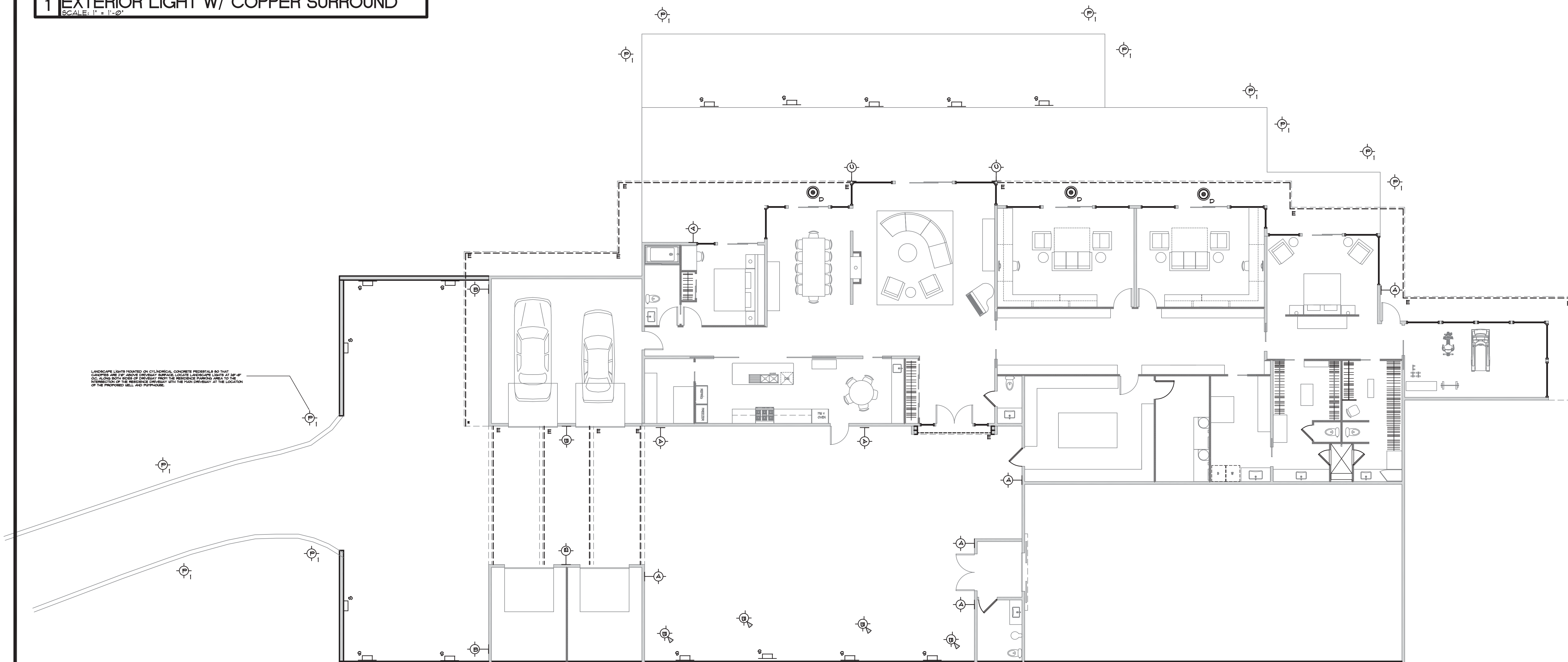


1 EXTERIOR LIGHT W/ COPPER SURROUND
SCALE: 1" = 1'-0"

EXTERIOR LIGHTING FIXTURE SCHEDULE

NOTE: ALL OUTDOOR LIGHT FIXTURES SHALL BE UL LISTED FOR USE IN WET LOCATIONS (TYP.)

SYM	FUNCTION	MANUFACTURER	MODEL #	TRIM / COLOR	LAMP	REMARKS
A	WALL SCONCE	SUPERIOR	5418WA8BL118QEW-K	16 OZ. COPPER	18W CF	COPPER SURROUND, SEE DETAIL 1 SUPERIOR LTG. CONTACT INFO: 800-432-7995
B	FLOOD LIGHT ON MOTION DETECTOR	RAB	QB-2	BLACK	(2) R40 75W	W/ INTEGRAL SMS-500 MOTION DETECTOR
C	WALL SCONCE	BEGA	6322P	BLACK	13W CF QUAD 2P	
D	DOWNLIGHT RECESSED CAN	HALO	H457ICAT	TL410SN REFLECTOR W/ FROSTED GLASS LENS BAFFLE: SATIN NICKEL (SN) - TRIM: SN	560 LUMEN LED 3000K	
E	STRIP LIGHT	FLEXFIRE LED	ULTRABRIGHT SLIM SERIES	BRONZE ALUM. CHANNEL	4.4W PER FOOT LED STRIP	CONTINUOUS STRIP LIGHTING FASTENED TO TRELLIS MEMBERS. BRONZE COLOR ALUMINUM CHANNEL WITH CLEAD COVER CONTINUOUS. MANUFACTURER'S POWER SUPPLY AND CONNECTOS, SIZED TO LENGTH.
P 1	PATH LIGHT	FX LUMINAIRE	DM-20 DELMARE	COPPER	20W T4 XENON	FX LUMINAIRE POTENZA 120VOLT TO 12V TRANSFORMER W/ PHOTOCONTROL SWITCH OR EQUAL. MANUFACTURER, SIZE AND LOCATION TO BE SELECTED BY ELECTRICIAN AND FIELD VERIFIED W/ ARCHITECT
B	GARDEN LIGHT	FX LUMINAIRE	LO-35 LAMPADA OTTONE	COPPER	35W - MR-16 XENOLUX - 40°	120VOLT TO 12V TRANSFORMER
S	STEP LIGHT	FX LUMINAIRE	CP-10 CANDELAPASSO	COPPER	10W T4 XENON	



NORTH

SITE ELECTRICAL PLAN
1/4" = 1'-0"

SCHLOSSER, NEWBERGER ARCHITECTS
ROBERT SCHLOSSER and TODD NEWBERGER
435 NORTH MAIN STREET FORT BRAGG, Ca. 95437
Phone (707) 961-0911 Fax (707)961-0912
www.lendesign.com

SITE ELECTRICAL PLAN RESIDENCE

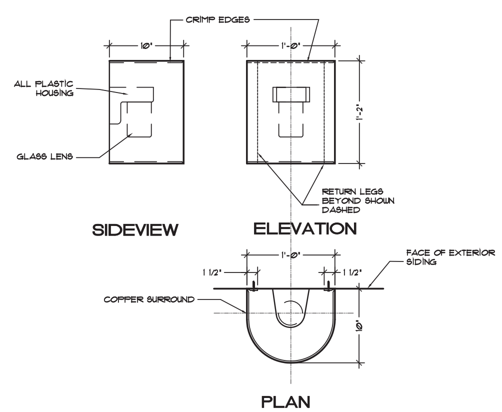
NEW SINGLE FAMILY RESIDENCE FOR:
KEN and ROSWITHA SCHAFFER
3890 NORTH HIGHWAY ONE
ALBION, CA 95410

ISSUE DATE
5-21-18
REVISIONS

LICENSED ARCHITECT
ROBERT SCHLOSSER
C-13301
4/30/2019
Renewal Date
STATE OF CALIFORNIA

DRAWN
CHECKED
SCALE
AS NOTED
SHEET
E1.2
OF SHEETS

ATTACHMENT E



1 EXTERIOR LIGHT W/ COPPER SURROUND
SCALE: 1" = 1'-0"

EXTERIOR LIGHTING FIXTURE SCHEDULE

NOTE: ALL OUTDOOR LIGHT FIXTURES SHALL BE UL LISTED FOR USE IN WET LOCATIONS (TYP.)

SYM	FUNCTION	MANUFACTURER	MODEL #	TRIM / COLOR	LAMP	REMARKS
A	WALL SCONCE	SUPERIOR	5418WA8BL118QEW-K	16 OZ. COPPER	18W CF	COPPER SURROUND, SEE DETAIL 1 SUPERIOR LTG. CONTACT INFO: 800-432-7995
B	FLOOD LIGHT ON MOTION DETECTOR	RAB	QB-2	BLACK	(2) R40 75W	W/ INTEGRAL SMS-500 MOTION DETECTOR
C	WALL SCONCE	BEGA	6322P	BLACK	13W CF QUAD 2P	
D	DOWNLIGHT RECESSED CAN	HALO	H457ICAT	TL410SN REFLECTOR W/ FROSTED GLASS LENS BAFFLE: SATIN NICKEL (SN) - TRIM: SN	560 LUMEN LED 3000K	
E	STRIP LIGHT	FLEXFIRE LED	ULTRABRIGHT SLIM SERIES	BRONZE ALUM. CHANNEL	4.4W PER FOOT LED STRIP	CONTINUOUS STRIP LIGHTING FASTENED TO TRELLIS MEMBERS. BRONZE COLOR ALUMINUM CHANNEL WITH CLEAD COVER CONTINUOUS. MANUFACTURER'S POWER SUPPLY AND CONNECTOS, SIZED TO LENGTH.
P 1	PATH LIGHT	FX LUMINAIRE	DM-20 DELMARE	COPPER	20W T4 XENON	FX LUMINAIRE POTENZA 120VOLT TO 12V TRANSFORMER W/ PHOTCONTROL SWITCH OR EQUAL, MANUFACTURER, SIZE AND LOCATION TO BE SELECTED BY ELECTRICIAN AND FIELD VERIFIED W/ ARCHITECT
B	GARDEN LIGHT	FX LUMINAIRE	LO-35 LAMPADA OTTONE	COPPER	35W - MR-16 XENOLUX - 40°	120VOLT TO 12V TRANSFORMER
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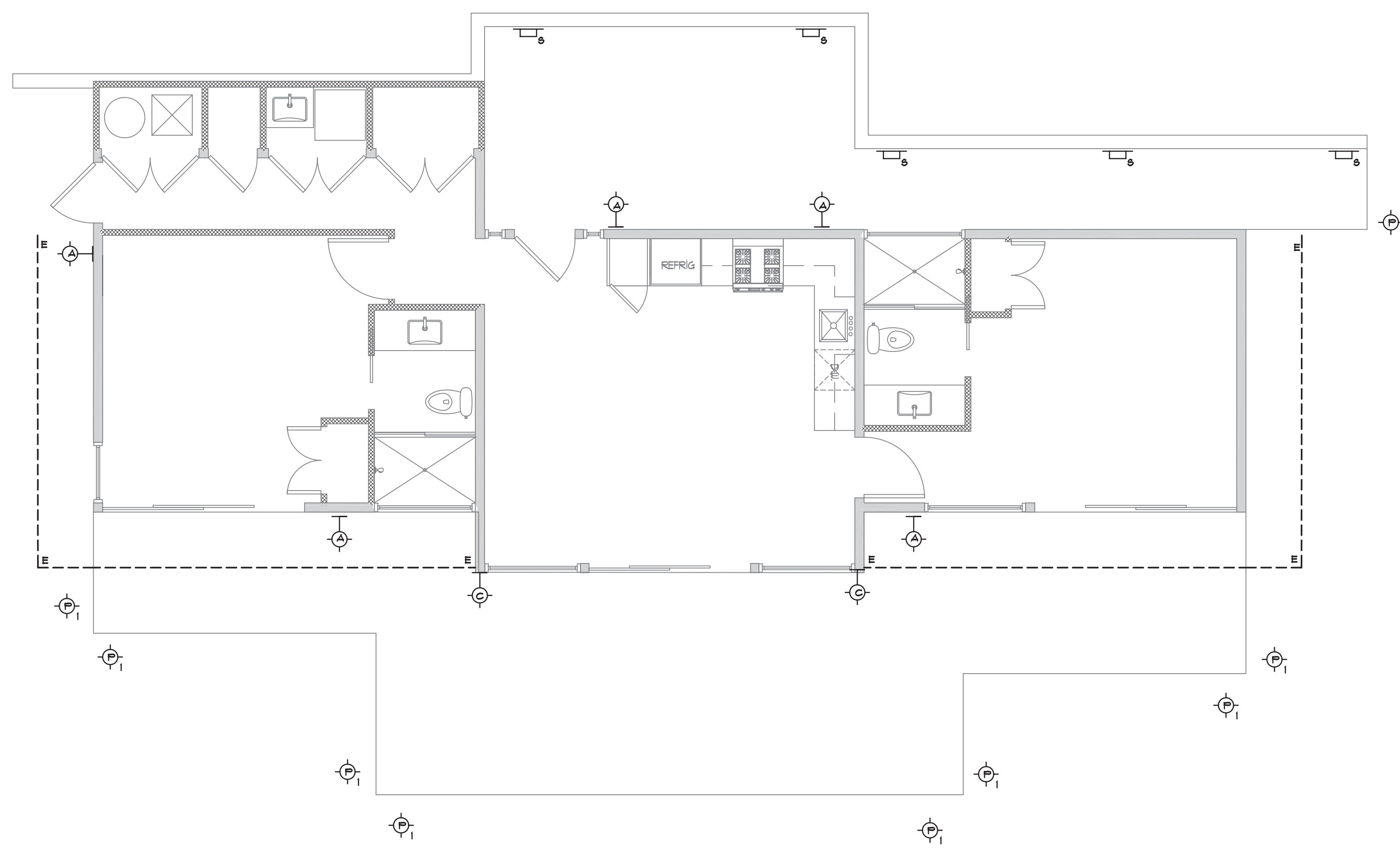

LANDSCAPE LIGHTS MOUNTED ON CYLINDRICAL CONCRETE PEDESTALS WHERE NECESSARY SO THAT CANOPIES ARE 2'0" ABOVE TO PATHWAY OR PARKING AREA SURFACE. LOCATE LANDSCAPE LIGHTS AT 10'-0" O.C. ALONG ONE SIDE OF PATHWAY FROM THE FAMILY CARE UNIT TO THE PARKING AREA TO THE NORTHWEST OF THE BUILDING AND AROUND THE PERIMETER OF THE PARKING AREA.

NORTH

SITE ELECTRICAL PLAN

1/4" = 1'-0"

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SITE ELECTRICAL PLAN
FAMILY CARE UNIT

NEW SINGLE FAMILY RESIDENCE FOR:
KEN and ROSWITHA
SCHAFFER
3890 NORTH HIGHWAY ONE
ALBION, CA 95410

ISSUE DATE
5-21-18
REVISIONS

LICENSED ARCHITECT
ROBERT SCHLOSSER
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4/30/2019
Renewal Date
STATE OF CALIFORNIA

DRAWN
CHECKED
SCALE
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SHEET
E1.2
OF SHEETS