April 15, 2015
File: 502.302altr.doc

Monahan Pacific Corporation
1101 Fifth Avenue, Suite 300
San Rafael, CA 94901

Attn: Mr. Geoffrey Forner

Re: Geotechnical Feasibility Evaluation
Cotati Village Mixed Use/"Reds" Site
Northwest Corner of Alder Ave and Hwy 116
Cotati, California

Gentlemen:

Introduction

This letter summarizes our geotechnical feasibility evaluation of the +/- 5.5 acre property located at the northwest corner of Alder Avenue and Highway 116 in Cotati, California. We are providing services in accordance with our proposal and Monahan Pacific Corporation's PW April 5, 2016. Our scope of services included review of readily-available reference documents, a site reconnaissance to observe existing conditions, brief evaluation of geologic and geotechnical hazards, and preparation of this report discussing geologic/geotechnical factors affecting the feasibility of the proposed site development along with some preliminary design criteria.

Project Description

The proposed project consists of removing an existing commercial "tavern", two homes and outbuildings currently located on the subject site and constructing new commercial and institutional improvements on the two subject parcels. Proposed improvements include a +/- 6,000 square foot office building along the frontage of Highway 116 (Gravenstein Highway), and the remainder of the project area will be developed as an assisted living facility including a 35-unit, single-story, memory care unit, and adjacent two-story general assisted living facility. Ancillary improvements are anticipated to include asphalt paved roadways and parking lots, underground utilities, concrete flatwork for patios and sidewalks and landscape areas. Buildings are anticipated to be of slab-on-grade construction utilizing shallow foundations. A Site Plan is provided on Figure 1.

Existing Site Conditions

During a brief site reconnaissance we performed on April 12, 2016, our staff personnel walked portions of the property to document existing surface conditions. As mentioned above, the site is improved with several structures including a single-family residence and detached garage, and old tavern, workshop/barn structure, and a couple small sheds located mainly in the southeast corner of the property. A second single-family residence and detached garage is located in the northeast corner of the property. Driveways providing access to the various structures from Alder Avenue and Gravenstein Highway are gravel surfaced. The minimal flatwork around the structures seems to be performing relatively well considering their age with no evidence of significant heaving or expansion cracking. The structures themselves, while old and dilapidated, also seem to be performing relatively well with no significant foundation

1333 N. McDowell Boulevard, Suite C, Petaluma, California 94954
707/765-6140 Fax-707/765-6222

distress observed. We noted that the majority of the site is undeveloped with tall grasses, some small shrubs and a few mature trees.

Regional Geology

The site is located within the Coast Range Geomorphic Province of California. The regional bedrock geology consists of complexly folded, faulted, sheared, and altered sedimentary, igneous, and metamorphic rock of the Jurassic-Cretaceous age (65-190 million years ago) Franciscan Complex.

For the last 15,000 years, the sea level has continually risen (due to melting of glaciers from the Wisconsin glaciations) and flooded lower topographic zones. For the last 8,000 years, silt and clay particles carried in suspension in floodwater have been deposited in the San Francisco Bay and adjacent tidal river basins to form a highly compressible clay/silt/organic soil known as "bay mud." This process continues today.

Regional geologic mapping by the California Geological Survey (CGS 2003) indicate the project site is underlain by Pleistocene alluvial fan deposits consisting of undivided silt, clay, sand and gravel. Artificial fill is mapped along Highway 116, likely as part of the initial roadway construction.

Expected Subsurface Conditions

Based on our review of available reference documents and experience in the area, we anticipate that subsurface conditions at the site will consist of recent alluvial deposits, mainly clays and sands. Bedrock will be quite deep and groundwater depths can be relatively shallow during the winter months. Our surficial review of the sandy and clay soils suggest low to moderate plasticity with moderate stiffness.

Seismicity

The project site is located within a seismically active area and will therefore experience the effects of future earthquakes. Within the Bay Area, faults are concentrated along the San Andreas Fault zone. The movement between rock formations along either side of a fault may be horizontal, vertical, or a combination and is radiated outward in the form of energy waves. The amplitude and frequency of earthquake ground motions partially depends on the material through which it is moving. The earthquake force is transmitted through hard rock in short, rapid vibrations, while this energy movement becomes a long, high-amplitude motion when moving through soft ground materials, such as bay mud.

An “active” fault is one that shows displacement within the last 11,000 years and, therefore, is considered more likely to generate a future earthquake than a fault that shows no sign of recent rupture. The locations of the currently known active faults relative to the project site are shown on Figure 2.

Preliminary Geologic Hazards Evaluation

This section identifies preliminary geologic hazards at the project site, their potentially significant adverse impacts on planned development, and common (feasible) mitigation measures, as appropriate. The most significant geologic hazards at the project site are likely to be strong seismic ground shaking and potentially expansive soils. These and other commonly considered

geologic hazards are discussed below. A more detailed review of hazards will be included in a future design-level report.

Seismic Shaking: The site will likely experience seismic ground shaking similar to other areas in the seismically active Bay Area. Earthquakes along several active faults in the region could cause moderate to strong ground shaking at the site. The intensity of earthquake motion will depend on the characteristics of the generating fault, distance to the fault and rupture zone, earthquake magnitude, earthquake duration, and site specific geologic conditions. Alluvial soil deposits underlie the site. Therefore, a CBC soil Type of S_D (stiff soil profile) should be applied to the site for seismic analysis. A summary of the principle active faults affecting the site, their closest distance to the development area, moment magnitude of characteristic earthquake, and probable peak ground accelerations at the site are shown in Table A.

TABLE A
ESTIMATED PEAK GROUND ACCELERATION
FOR PRINCIPLE ACTIVE FAULTS
COTATI VILLAGE MIXED USE
COTATI, CALIFORNIA

Fault	Moment Magnitude for Characteristic Earthquake	Closest Estimated Distance (kilometers)	Median Peak Ground Acceleration (g)
Rodgers Creek	7.3	7.7	0.34
San Andreas	8.0	24.5	0.22
Maacama	7.4	22.5	0.19
Hayward	7.3	44.0	0.11
San Gregorio	7.4	48.3	0.11

1) REFERENCE: Caltrans ARS (2016)

The most likely source for future earthquakes close to the site is the Rodgers Creek Fault. The calculated accelerations should only be considered as reasonable estimates. Many factors (soil conditions, distance, orientation to the fault, etc.) can influence the actual ground surface accelerations.

The potential for strong seismic shaking at the project site is high. The significant adverse impact associated with strong seismic shaking is potential damage to structures and improvements.

Seismic Shaking Mitigation Measures - The seismic design of the structure should be in accordance with the most recent version of the California Building Code (CBC, 2013). Based on our reconnaissance, a CBC soil type of S_D (stiff soil) will likely apply to the development area.

Fault Surface Rupture: Under the Alquist-Priolo Special Studies Zone Act, the California Division of Mines and Geology produced 1:24,000 scale maps showing all known active faults and defining zones within which special fault studies are required (CDMG, 2000). The site is not located within an Alquist-Priolo Special Studies Zone. The potential for fault surface rupture at the site is therefore remote.

No mitigation measures are required.

Liquefaction Potential: Liquefaction refers to the sudden, temporary loss of soil strength during strong ground shaking. This phenomenon can occur in saturated, loose, granular deposits when they are subjected to seismic shaking. Liquefaction related phenomena include seismically induced settlement, flow failure, and lateral spreading.

The anticipated subsurface conditions include variable alluvial deposits. Alluvial deposits typically consist of layers of clayey, sandy and gravelly soils. The granular layers may be susceptible to liquefaction. Liquefaction susceptibility mapping by the Association of Bay Area Governments (ABAG) indicates that the majority of the site has a low potential of liquefaction, while a small area along the frontage of Highway 116 has a moderate potential of liquefying.

Liquefaction Mitigation Measures – None likely, although subsurface exploration must be performed to confirm the absence of loose, saturated granular layers.

Flooding: FEMA maps indicate that the project site is within a 500-year flood zone. Detailed evaluation of the flooding potential at the site and design of appropriate flood control and drainage improvements, including finished floor elevations, should be provided by the project Civil Engineer.

Flooding Mitigation Measures – Design of drainage facilities for the project is normally conducted by the project Civil Engineer.

Expansive Soil: Expansive soils tend to change volume (shrink & swell) with seasonal changes in moisture content. During our site reconnaissance, surficial soils around the project site seemed to have low to moderate expansive potential. Further evaluation of surficial soils should be conducted during an investigation report.

Expansive Soil Mitigation Measures – Expansive soils, if present, could be mitigated through compaction at high moisture contents, over-excavation and replacement or potentially through lime treatment. Evaluation and recommendations for expansive soil mitigation measures should be included as part of a future Geotechnical Investigation report.

Conclusions

Based on our evaluation, we judge the project is feasible from a geotechnical standpoint. The significant geologic and geotechnical issues that need to be considered for development include the potential for strong ground shaking and expansive soils. Other issues, such as liquefaction will need to be considered. A geotechnical investigation with subsurface exploration and laboratory testing will be required to provide design-level recommendations and criteria for the project.

As discussed above, strong seismic ground shaking can be mitigated by careful design in accordance with current building codes using stiff soil site parameters. Shallow foundations and slab-on-grade lower floors are likely appropriate for the planned improvements as long as expansive soils are mitigated. Asphalt pavements should also be feasible, as are conventional concrete sidewalks. Lime treatment could be considered to strengthen soils and reduce required pavement sections and lime can also “winterize” the site to expand the construction season.

Supplemental Services

As the project planning progresses, a design-level geotechnical investigation including subsurface exploration and laboratory testing will be needed to provide geotechnical recommendations and criteria for the design and construction of the project.

When the plans and specifications near completion, we should review them to confirm that the intent of our geotechnical recommendations has been incorporated and provide supplemental recommendations, if needed.

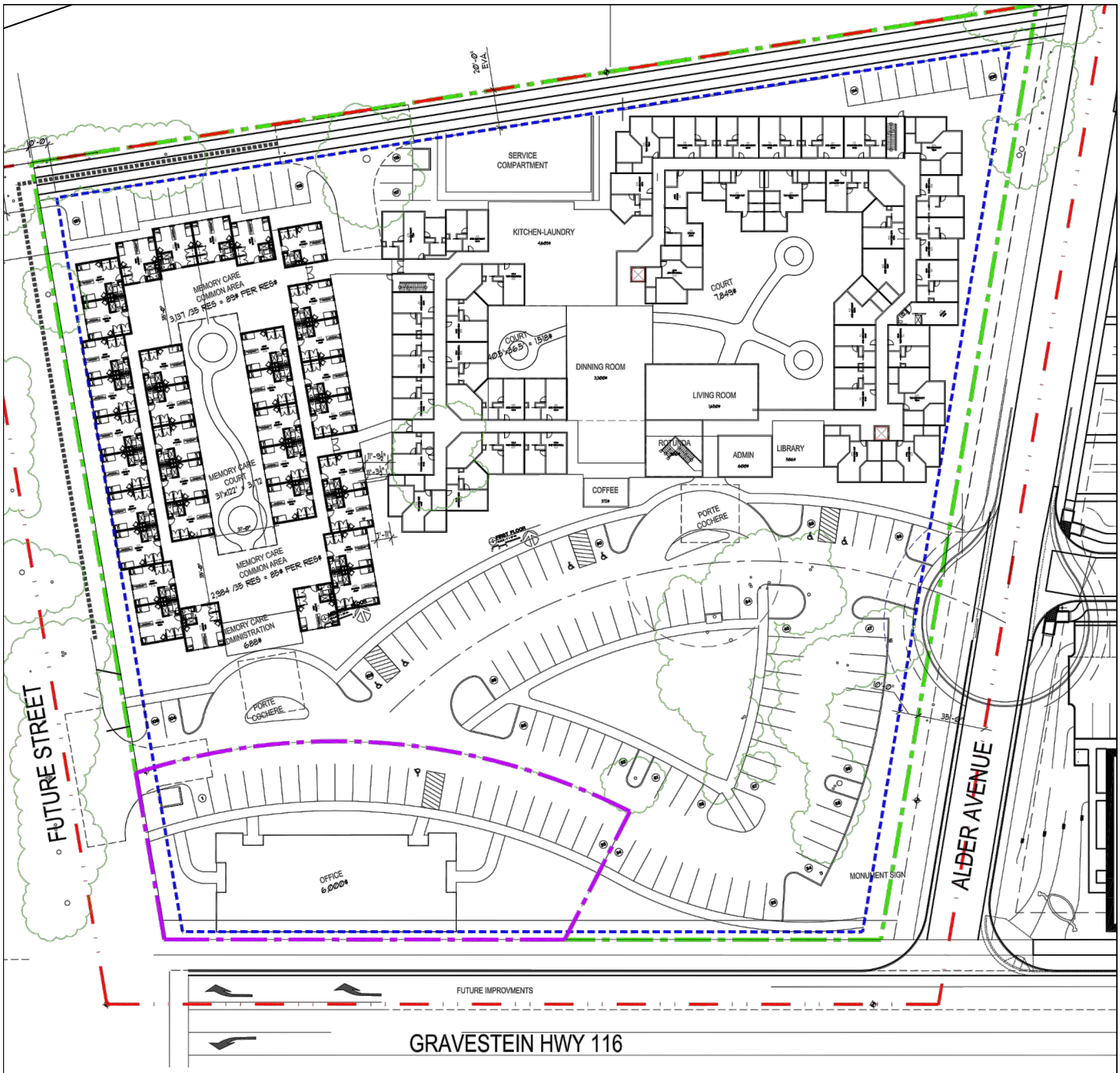
During construction, we must observe and test the geotechnical portions (foundations, subsurface drainage, site grading, etc.) of the project to confirm that subsurface conditions are as expected and that our recommendations are still appropriate for the site conditions.

Please call if there are any questions or if we can be of further service.

Yours very truly,
MILLER PACIFIC ENGINEERING GROUP

Mike Morisoli
Geotechnical Engineer No. 2541
(Expires 12/31/16)

Attachments: Figure 1, Site Plan
Figure 2, Active Fault Map



SITE PLAN

SCALE

0 40 80 160 FEET

REFERENCE: Site Plan Provided by Ronald James Ped Architects

MILLER PACIFIC ENGINEERING GROUP
504 Redwood Blvd.
Suite 220
Novato, CA 94947
T 415 / 382-3444
F 415 / 382-3450
www.millerpac.com

A CALIFORNIA CORPORATION, © 2015, ALL RIGHTS RESERVED

FILE: 502.302 Figures.dwg

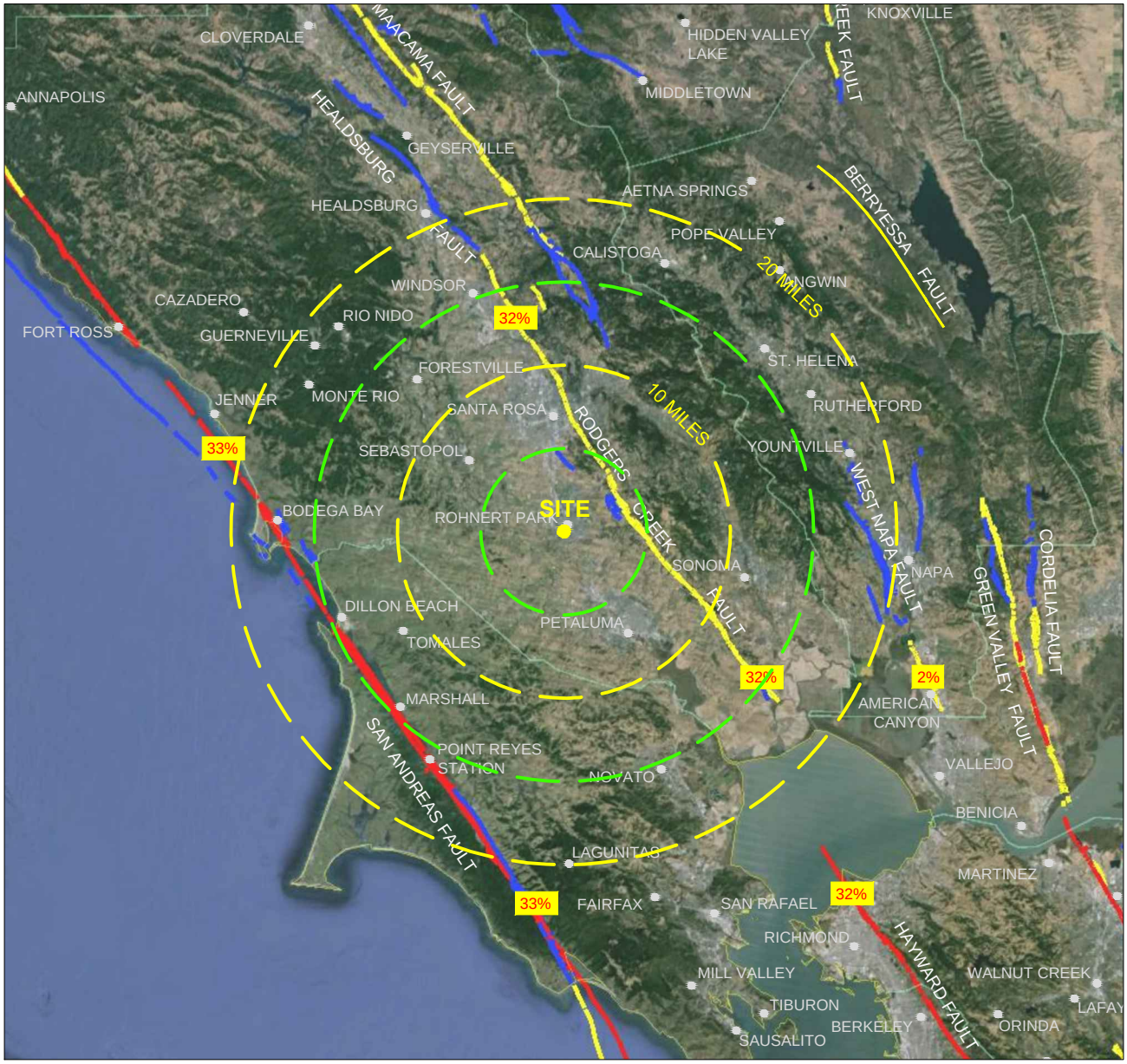
SITE PLAN

Cotati Village Mixed Use
Alder Avenue and Highway 116
Cotati, California

Project No. 502.302 Date: 4/7/16

Drawn NGK
Checked

1
FIGURE



SITE COORDINATES: LAT. 38.3334, LON. -122.7213

NORTH

LEGEND

(COLOR INDICATES AGE OF MOST RECENT KNOWN MOVEMENT)

- HISTORIC (<150 YEARS)
- HOLOCENE (<11,000 YEARS)
- LATE QUATERNARY (<1.0M YEARS)
- 32% PROBABILITY OF AT LEAST ONE M>6.7 EARTHQUAKE BETWEEN 2015 AND 2045 FOR FAULTS SHOWN

DATA SOURCE:

1) Working Group on California Earthquake Probabilities (WGCEP)(2014), "Long-Term Time-Dependent Probabilitites for the Third Uniform California Earthquake Rupture Forecast (UCERF3), Bulletin of the Seismological Society of America (BSSA), Volume 105, No. 2A, 33pp, April 2015.

MILLER PACIFIC ENGINEERING GROUP
504 Redwood Blvd.
Suite 220
Novato, CA 94947
T 415 / 382-3444
F 415 / 382-3450
www.millerpac.com

A CALIFORNIA CORPORATION, © 2015, ALL RIGHTS RESERVED

FILE: 502.302 Figures.dwg

ACTIVE FAULT MAP

Cotati Village Mixed Use
Alder Avenue and Highway 116
Cotati, California

Project No. 502.302 Date: 4/7/16

Drawn NGK
Checked

2
FIGURE