MEMORANDUM

To: Bernard Rottner (COM)
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cc: Will Korger (ZFA)
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From: Dona Mann, P.E., G.E. (A3GEO)

Project: College of Marin, Kentfield Campus – New Academic Center (NAC) Building

Date: March 7, 2013

Supplemental Geotechnical Recommendations
Existing (On-Site) Fill Materials and Proposed Lightweight Lava Rock
College of Marin (COM), Kentfield Campus – New Academic Center (NAC) Building

Per your request, we are providing the following supplemental recommendations for the existing (on-site) fill materials and proposed lightweight lava rock:

**Input Parameters for L-Pile Analyses - Existing (On-Site) Fill Materials**

<table>
<thead>
<tr>
<th>Material</th>
<th>( \gamma ) (pcf)</th>
<th>( c_u ) (psf)</th>
<th>( \phi ) (degrees)</th>
<th>L-Pile p-y curve Soil Model</th>
<th>Soil Strain Parameter, ( E_{50} )</th>
<th>Soil Modulus Parameter, ( k ) (pci)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Existing Fill</td>
<td>110</td>
<td>0</td>
<td>28</td>
<td>Sand (Reese)</td>
<td>See note 4.</td>
<td></td>
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</tbody>
</table>

**Where:**
- \( \gamma \) = Total unit weight, pcf
- \( c_u \) = Undrained shear strength, psf
- \( \phi \) = Angle of internal friction, degrees

**Notes:**
1. Design groundwater level is at Elevation +10 feet.
2. Refer to “Geotechnical Investigation and Geologic Hazard Study” by A3GEO dated January 18, 2012, and “Supplemental Foundation Consultation Letter” by A3GEO dated May 18, 2012 for additional information. The parameters presented herein are intended to be used by the project structural engineer for the sole purpose of developing preliminary estimates of pile performance. The contractor will be required to provide a pile design that meets the performance criteria specified in the contract documents.
3. Effective unit weight = Total unit weight minus the unit weight of water.
4. It is acceptable to use L-Pile default parameters for soil modulus (k) and soil strain (\( E_{50} \)) based on the p-y curve soil model specified.
5. For material layer thicknesses, refer to attached cross-sections. Please note, Section A-A’ (Figure 3) has been revised.
6. Reliable contact between soil and/or rock and foundation element must be achieved.
7. Parameters presented herein do not include a factor of safety.
Passive Resistance for Existing Fill and Proposed Lightweight Lava Rock

For existing (on-site) fill soils and compacted lightweight lava rock [with a unit weight on the order of 60 pounds per cubic foot (pcf)], we recommend an allowable passive pressure equal to an equivalent fluid weighing 150 psf per foot of depth to a maximum value of 1500 psf (factor of safety \( \approx 2 \)).

Notes:

1. The information presented herein is supplementary to the recommendations provided in the “Geotechnical Investigation and Geologic Hazard Study” by A3GEO dated January 18, 2012, the “Supplemental Foundation Consultation Letter” by A3GEO dated May 18, 2012, and memorandums dated July 17, 2012 and October 18, 2012 which were titled “Geotechnical Input Parameters for L-Pile Analyses”, and “Lateral and Seismic Load Parameters for Lightweight Fill Materials”, respectively.
2. Passive resistance acting on the sides of grade beams in existing fill can be assumed to start at the bottom of the slab provided that the contract documents require that: 1) A3GEO inspect all grade beam trenches, and 2) the contractor remove and re-compact unsuitable materials as required by A3GEO.
3. Passive pressure may be increased by one-third for dynamic loading.
4. Passive pressure can be fully mobilized at \( \frac{1}{2} \)“ deformation or less.
5. It is essential that A3GEO review the contract documents before they are finalized to check conformance with the intent of our geotechnical recommendations.