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REVIEW OF GEOTECHNICAL REPORTS BY GEOCON AND TREADWELL-ROLLO FOR COAST HOTEL/DREAM INN MIXED USE DEVELOPMENT

SUMMARY COMMENTS

1. Both reports are fairly standard geotechnical investigations based on several soil borings, a few measurements of soil properties, and with most of report being typical boilerplate on grading/excavation/drainage/construction criteria. The techniques used are appropriate for the site.

2. With non-local consulting firms, as is the case for both of these reports, the details of the local geology/seismology/etc. of the region are usually quite brief.

3. The Treadwell-Rollo investigation was focused on a larger project and as a result was a more comprehensive investigation as part of an Environmental Impact Report. The consultant who performed the coastal erosion/cliff stability/etc. portion of that report (John Kasunich of Haro-Kasunich & Associates) is the geotechnical engineer I had mentioned in our phone conversation as the best local person to involve if we felt that additional input was necessary.

3. The GEOCON investigation provided more information on their four soil borings than the Treadwell-Rollo report included for their two on-site boring. More specifically, the GEOCON borings took 5-7 Standard Penetration Test (STP) measurements in each of their borings, whereas Treadwell-Rollo
collected just 3 readings for each of the borings.

The STP values provide very useful information on the bearing capacity of the two materials underlying the site, and are obtained by driving a sampler into the soil with a 140-pound hammer dropping repeatedly through a 30-inch fall; the STP values are the number of blows or drops of the hammer to advance the sampler one foot. Where very firm material is encountered, which is the case with the underlying bedrock on this site, the sampler was driven less than 12 inches and counts are given for the actual penetration depth: 50 blows for 5 inches, for example.

4. The six borings from 2004 and 2017 reveal very uniform conditions at depth on the site as follows (see attached composite boring logs). This uniformity of conditions across the site indicates to me that additional borings are not necessary.

NATURE OF SUBSURFACE MATERIALS

• *Surficial asphalt and base rock*- less than 12 inches

• *Quaternary Terrace Deposits*- Clayey sands: To depths of 13-14 feet
  - Blow counts (for 12 inches) 10-29.
  - Water table is quite uniform and is perched just above the Purisima sandstone and at a depth of 12-13 feet in four of the five holes where water was encountered. In B-1 the water table was recorded at a depth of 16 feet, two feet below the base of the sandy terrace deposits. There is a strong permeability contrast between these sandy terrace deposits and the underlying bedrock across the entire west side of Santa Cruz, which leads to a common shallow perched seasonal water table.

•*Tertiary Purisima Formation*- weathered sandstone encountered at consistent depth of 13-14 feet that extended to bottom of borings (19.5 – 29.5 feet). Blow counts in Purisima sandstone ranged from 47-57 for 12 inches of penetration. Where sandstone was firmer, very high blow counts were recorded to penetrate intervals of less than 12 inches: 50/5", 80/11", 77/11", 90/9", indicating very firm material. The Purisima bedrock very capable of supporting loads planned for
the site.

ISSUES/QUESTIONS

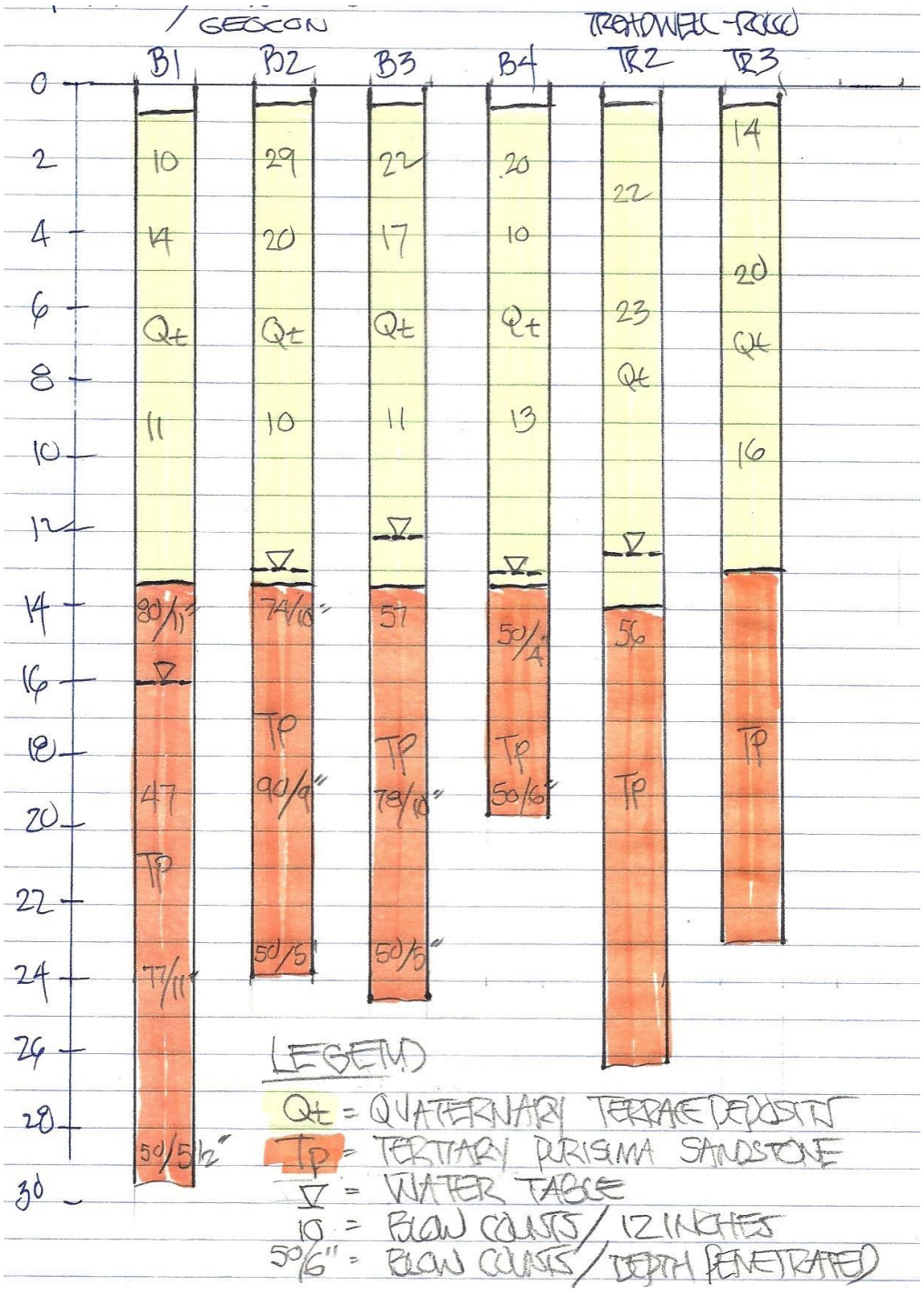
• One level of parking below grade vs. two levels of parking? GEOCON investigation assumed one level. In our phone conversation I thought I understood that you were considering the possibility of two levels of below ground parking.

The clayey sands of the Quaternary Terrace Deposits extend to depths of 13-14 feet. Based on the unconsolidated nature of these materials, and their low blow counts, so I see no problems excavating to this depth. Blow counts in the underlying Purisima bedrock indicate it is a very firm material although boring log indicates: "excavates as sand". If the plan is to develop two levels of parking below grade, this is the place where a geotechnical engineer or grading contractor needs to weigh in on the effort and equipment needed to go to 18 feet, 20 feet? There may be local experience within the city of experience with Purisima sandstone excavation to this depth? The construction of 10-story Dream Inn may have involved significant excavation into the Purisima bedrock.

• Depending upon depth of excavation, the perched water table will need to be dealt with. During field borings, the water table was present 12-13 feet below grade and perched on Purisima (except B-1). Waterproofing of below grade concrete walls would be needed combined with a collection and drainage system.

• Based on shortest distance to coastal bluff and seaward edge of Dream Inn (~160 feet) from proposed development, and depending upon depth of excavation and methods or equipment used, I don't see any significant impact of excavation on stability of coastal bluff beneath hotel.

COMPOSITE OF SOIL BORING LOGS FROM BOTH SURVEYS


/ GEOCON
TREMIE-ROCO
B1
B2
B3
B4
TR2
TR3
0
2
4
6
8
10
12
14
16
18
20
22
24
26
28
30
10
14
Qt
11
80/11"
47
Tp
77/11"
50/5½"
29
20
Qt
10
74/10"
Tp
90/9"
50/5"
22
17
Qt
11
57
Tp
78/10"
50/5"
20
10
Qt
13
50/4"
Tp
50/6"
22
23
Qt
56
Tp
14
20
Qt
16
Tp
LEGEND
Qt = QUATERNARY TERRACE DEPOSITS
Tp = TERTIARY PURISIMA SANDSTONE
▽ = WATER TABLE
10 = BLOW COUNTS / 12 INCHES
50/6" = BLOW COUNTS / DEPTH PENETRATED