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To: MR. ERIC FREDRICKSEN
Division of Engineering Services
Architectural and Structural Design

Attention: Mr. Gong Hong

Date: August 30, 2005

File: 04-SM-1-KP61.2/61.8
Devil's Slide Tunnel OMC
Bridge No. 35-0330
EA: 04-1123U1

From: **DEPARTMENT OF TRANSPORTATION**
DIVISION OF ENGINEERING SERVICES
GEOTECHNICAL SERVICES – MS 5

Subject: Foundation Recommendations

A foundation investigation was completed at the site in July and August 2005. Because the site is currently being regraded, it was not possible to conduct drilling and sampling observations, and there will be no Log of Test Borings. All recommendations are based on observations of site conditions and grading operations in July and August, 2005.

GEOLOGY

The building site is within a small quartz diorite pluton. Rock is generally intensely weathered or decomposed to brown silty sand and gravel, however fresh white quartz diorite has been locally exposed due to the site grading currently in progress. Up to 14 m (46') of the rock at the site has been, or will be removed.

Groundwater has not been encountered during the grading process, and is not expected.

SEISMICITY

The site is between the San Gregorio Fault Zone (Seismic Source Type A, M=7.5) about 2.5 km (1.5 mi) to the southwest, and the San Andreas Fault (Seismic Source Type A, M=8), 8 km (5 mi) to the northeast. Use UBC Seismic Zone 4 (Z=0.4), soil type SC, Seismic Coefficient C_a = 0.4, Seismic Coefficient C_v = 0.56, Near-Source Factor N_a = 1.5, and Near-Source Factor N_v = 2.0, for design.

SITE CONDITIONS

The building site was, until very recently, a small hill. Up to 14 m (46') of the hill has been, or will be, removed down to elevation +60 m to provide a level building pad for the OMC building. The majority of the building will be founded in cut consisting primarily of intensely weathered to decomposed quartz diorite bedrock. The remainder of the building, principally the eastern corner, and the eastern retaining wall, will be founded on fill. Discussions with the Resident Engineer of the current project revealed that native material being used for fill is compacted to 90% R.C. with difficulty. I have requested that fill material beneath the building and retaining wall be compacted to 95%, but this will apparently not be accomplished under the current construction project.

FOUNDATION RECOMMENDATIONS

The following recommendations are based on the foundation plans dated 07-26-05, and the General Plan current as of August 1, 2005.

The OMC building and retaining wall may be founded on a combination of spread footings and continuous strip footings. All footings constructed in original ground may use an allowable bearing capacity of 200 kPa (2 tsf) (ultimate bearing capacity > 600 kPa , 6 tsf).

Footings constructed in fill may use an allowable bearing capacity of 170 kPa (1.75 tsf) for widths less than 310 mm (24"), and 200 kPa (2 tsf) for widths greater than 310 mm (24") provided the fill is removed to a depth of one meter below the bottom of footing, or to undisturbed original ground, and replaced with granular material compacted to 95% R.C. For estimating purposes, it may be assumed that fill will underlie the building wherever the original ground elevation was less than +61m. Final grade is about elevation +60 m, but grading will have removed unsuitable material (topsoil) below elevation +60 m.

The retaining wall near the east corner of the building may be founded on spread footings with an allowable capacity of 200 kPa (2 tsf) provided the fill is removed to a depth of one meter below the bottom of footing and replaced with granular material compacted to 95% R.C. To minimize the possible effects of differential settlement between the

building and retaining wall, the retaining wall and building footings should not be structurally connected.

DESIGN PARAMETERS

Assuming backfill used is material generated from the current grading project, you may assume a unit weight of 120 pounds per cubic foot for all fill. The allowable active earth pressure may be taken as 31 pcf (equivalent fluid pressure), and passive earth pressure may be taken as 462 pcf. The earth pressure at rest assuming compacted fill may be assumed to be 96 pcf, in native material it is 48 pcf. Modulus of vertical subgrade reaction may be taken as 150 tons/ft^3. Sliding resistance between concrete and soil may be taken as 0.45.

Due to the proximity of the site to the ocean, there is no frost potential.

A vapor barrier is not required due to geotechnical concerns, however local building codes may require them.

CONSTRUCTION NOTES

Hard rock may be locally encountered, particularly where the excavated rock was thickest. Material disturbed during footing excavation should be compacted to 95% R.C., or removed and replaced with granular material compacted to 95% R.C.

If you have any questions or need additional information, please call John Bowman at 916-227-6980.

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