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FOUNDATIONS, WALLS, PILES
UNDERPINNING, TIEBACKS
DEEP RETAINED EXCAVATIONS
SHORING & BULKHEADS
CEQA, EARTHWORK & SLOPES
CAISSONS, COFFERDAMS
COASTAL & MARINE STRUCTURES

February 11, 2013

SOIL MECHANICS, GEOLOGY
GROUNDWATER HYDROLOGY
CONCRETE TECHNOLOGY

Thomas N. Lippe, Esq.
329 Bryant Street, Suite 3D
San Francisco, CA 94107

Subject: Central Subway Phase 2, North Beach Construction Variant, San Francisco
Proposed Termination & Extraction of TBMs in Block 101 (Pagoda Theater)
Supplement to Letter-Report of February 5, 2013

Dear Mr. Lippe:

In the subject letter-report I referenced City Planning's supplemental EIS/EIR and quoted from it (SFPD 2013, page 17 ¶3) that the proposed excavation under the former Pagoda Palace was intended to be "70 feet below grade level" for the "retrieval shaft structure" (*clearly* indicated as ultimately 75 feet on the drawing (Figure 12, page 16). I have since heard that the depth shown by City Planning could be a mistake, that excavation depth would be about 42 feet. I have been asked if a 42 foot excavation presents the same negative effects on neighboring properties as would an excavation of 75 feet. The answer is yes: Underpinning and tiebacks under adjacent buildings and dewatering outside the excavation will still be required for a 42 foot depth.

The geotechnical investigation report for La Corneta Taqueria postulated "weathered sandstone of the Franciscan formation may be present within 40 to 50 feet below ground surface" (Treadwell & Rollo 2008, page 7) therefore no part of a 42 foot deep excavation would be in competent bedrock. A 42 foot deep excavation will be about 36 feet below the groundwater table, which is at Elevation +56.5 feet (Treadwell & Rollo 2008, page 8) so it will be entirely in surficial materials (silts and clays intermixed with sand) where groundwater is flowing from Russian Hill to San Francisco Bay. Dewatering will be required outside the excavation for its full depth, which is consistently below all the adjacent buildings. No building in the area that will be affected by the excavation has a foundation or basement deeper than 10 feet below the surface grade (noted to be at nominal Elevation +62.5), so at least 30 feet of ground under the buildings surrounding the excavation will have groundwater (and particulate) pumped from beneath them.

Groundwater flowing from the predominately sandy materials above bedrock (at the 42 foot depth where an excavation would occur) is much more significant insofar as support for the surrounding buildings is concerned than groundwater that flows through the bedrock (from 42 feet to 70 feet deep), so the difference between a 42 foot excavation and a 75 foot excavation from a groundwater buoyancy and loss of ground standpoint is relatively insignificant. Another phenomenon not mentioned in the 2/5/13 letter-report is "piping"; water seeping through fine grained soils that erodes the soil grain-by-grain and forms pipes or tunnels that pull soil particles with dewatering. Buildings in fill and sand beyond the estimated influence of dewatering (noted on 2/5/13) are also likely to suffer and/or generate claims for damage.

Yours truly,


Lawrence B. Karp

