

LAWRENCE B. KARP
CONSULTING GEOTECHNICAL ENGINEER

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

SOIL MECHANICS, GEOLOGY
GROUNDWATER HYDROLOGY
CONCRETE TECHNOLOGY

May 19, 2023

City & County of San Francisco
Department of Building Inspection
49 South Van Ness Avenue
San Francisco, CA 94103

Subject: 870 El Camino del Mar
(Block 1312 - Lot 019)
P/A 2021.1112.2309, Issued 1/6/22

Attention: Enrique Argumedo
Building Inspector - District 5

Dear Mr. Argumedo:

This correspondence constitutes final report of civil/geotechnical engineering and construction for the subject project under the current building permit, as referenced, which includes construction that was part of the prior building permit (P/A 2018.0523.9894-SR1, Issued 9/3/20). The former drawing set consisted of 86 Sheets and the revised permit set is 10 Sheets. Unconstructed portions of 9894 were revised with 2309.

For the record, brief comments why the original foundation design was revised would be helpful. The design as originally permitted (9894) had to be revised to become appropriate for ground conditions encountered during construction of the first sequence (every other one, 7 of 15 total intended) of 24 inch diameter drilled shafts, (9894 Plan Numbers 1, 3, 5, 7, 9, 11, and 13 that were already drilled, reinforced, and concreted into 15 feet of bedrock sockets).

The former plan (9894, Sheet S2.01) showed too many drilled shafts that were too closely spaced in the hillside's foliated sedimentary rock (radiolarian chert and sandstone/shale of the Franciscan), and non-prettested Dywidag Threadbars shown as tiebacks that were short, weakly anchored, and placed too high in elevation so no more shafts were drilled. The original drawings showed completed shafts that would be interconnected only by a tied-back square concrete beam along the tops of the shafts so the system would do little to retain the upslope overburden of the curtilage which was remedied by interconnecting the in-place drilled shafts with reinforced concrete wall segments, heights ranging from 6 to 10 feet, founded in the foliated rock.

Tieback revisions included anchorage of the composite shafts/wall segments with 3 DCP tiebacks instead of 4, using larger (1-3/8 inch) Dywidag Threadbars that were prettested, and increasing tieback depths. Revisions included internal concrete struts transferring tieback restraint to form an integrated system. Tiebacks were lowered in height from 12 inches to 4 feet and their lengths were increased to 40 feet minimum primary zone, which combination caused a fully integrated foundation system that would contain the curtilage and stabilize it with the surrounding land.

The overburden retaining wall, created by the drilled shafts and interconnecting segments above the intact but contorted bedrock, will effectively retain the overburden where the drilled shaft arrangement shown in 9894 would allow soil and groundwater to migrate between the drilled shafts that could lead to destabilizing the slope below the shafts affecting land outside the curtilage and neighboring properties as well as reducing passive support to the drilled shafts. New internal concrete struts transfer the tieback restraint to form the integrated foundation system shown on the revised permit. As noted above, tiebacks were lowered in height from 12 inches to 4 feet, and their primary lengths were increased to 40 feet minimum; that combination caused a fully integrated foundation system to contain the curtilage and stabilize it with the surrounding land.

After the drawings were revised, the undersigned applied for permit revisions which were approved on 1/6/22 (10 sheets: Architectural G0.00, A301, A401, and Structural S0.01 (General Notes), S2.00 (Plan, which replaced 9894's composite S2.01), S3.01 (Elevations), S4.01 (Section), S5.02, S5.03 and S5.04 (Details). The drawing counterparts approved for 9894 on 9/3/20 for the 7 revised structural drawings of 2309 were S0.01, S201 S3.01, S4.01, S5.02, S5.03 and S5.04. Prior to approval, discussions were held with the Structural Advisory Committee.

Foundation construction has now been fully completed in accordance with the revised plans; all the work is of high quality. All excavations were inspected by the undersigned. Tiebacks were grouted and later tested with the undersigned present at 140% of the lock-off load shown on the approved structural drawings and then locked-off at design loads with rounded Howlett nuts to compensate for the vertical seat of the plates. All exposed steel was coated with Farbertite Coal Tar Epoxy, which should be maintained. The Job Card shows building transition between permits and photographic record, including relevant drawings, appear at www.lbkarp.com/ECDM.html.

Yours truly,



Lawrence B. Karp



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Chronological References

Karp, Lawrence B.- Consulting Geotechnical Engineer, January 13, 1988a; "Foundation Underpinning, 1983-84, 890 El Camino del Mar, San Francisco, CA" [Block 1312-Lot 026] (Observations of soil and rock exposed in pits excavated during emergency underpinning for lateral support of building), report prepared for Lynchpin Productions, 10 pages.

Karp, Lawrence B.- Consulting Geotechnical Engineer, March 23, 1988b; "Underpinning & Tieback Soldier Beam Bulkhead - Plans & Specifications-890 El Camino del Mar, San Francisco, CA [Block 1312-Lot 026] (Permit Application 8803897, Permit Approved 3/25/88 & Permit Application 8900825-Permit Approved 1/26/89) (emergency construction for lateral support on hillside), drawings & calculations prepared for Paul Kantner, 15 sheets.

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Karp, Lawrence B.- Consulting Geotechnical Engineer, January 3, 2000a; "890 El Camino del Mar, San Francisco, CA [Block 1312-Lot 026], Foundation Improvements - Phase II, Plans, Details & Specifications" (Permit Application 2000.01.14.171, Permit 899529-Issued 1/14/00) (replacement of bridge between garages and residence, and interconnection of concrete columns for lateral support integration on hillside), drawings prepared for Mr. & Mrs. Gary F. Bengier, 12 sheets.

Karp, Lawrence B.- Consulting Geotechnical Engineer, February 29, 2000b; "890 El Camino del Mar, San Francisco, CA [Block 1312-Lot 026], Foundation Improvements - Phase III, Plans, Details & Specifications" (Permit Application 2000.03.02.3362, Permit 903558-Issued 3/2/00) (underpinning/ interior tieback wall interconnecting existing foundations for lateral support/integration on slope), drawings prepared for Mr. & Mrs. Gary F. Bengier, 12 sheets.

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Karp, Lawrence B.- Consulting Geotechnical Engineer, July 17, 2000c; "890 El Camino del Mar, San Francisco, CA [Block 1312-Lot 026], Foundation Improvements-Phase IV, Plans, Calculations & Specifications" (Permit Application 2000.07.28.6381.R2) (underpinning, interior tieback wall, and grade beams interconnecting existing foundations for integration of lateral support for hillside building), drawings prepared for Mr. & Mrs. Gary F. Bengier, 14 sheets.

Karp, Lawrence B.- Consulting Geotechnical Engineer, December 19, 2012; "300 Sea Cliff Avenue, San Francisco, CA [Block 1307-Lot 001B]; Seismic Acceleration Parameters for Design", letter-report prepared for Tarawaya LLC (Marc Benioff), 2 pages.

Karp, Lawrence B.- Consulting Geotechnical Engineer, January 6, 2013^a; “300 Sea Cliff Avenue, San Francisco, CA [Block 1307-Lot 001B]; Foundation Recommendations”, report prepared for Tarawaya LLC (Marc Benioff), 15 pgs.

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Karp, Lawrence B.- Consulting Geotechnical Engineer, July 30, 2014^a; “300 Sea Cliff Avenue, San Francisco, CA [Block 1312-Lot 001B]; Added Piers, New Grade Beams, New Slab Between Beams, Permit Application 2011.03.31.3262, Special Inspections & Structural Observations”, letter-report prepared for the City & County of San Francisco, Department of Building Inspection [LR3/13], 1 pg.

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Karp, Lawrence B.- Consulting Geotechnical Engineer, August 7, 2014^c; “300 Sea Cliff Avenue, San Francisco, CA [Block 1312-Lot 001B]; Voluntary Local Partial Seismic Upgrade at North Corner of Building (Modification to P/A 2011.12.22.1203), P/A 2013.01.30.9077, Special Inspections & Structural Observations”, letter-report prepared for the City & County of San Francisco, Department of Building Inspection [LR10/13], 1 page.

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Karp, Lawrence B.-Consulting Geotechnical Engineer, July 21, 2019^b; “870 El Camino del Mar, San Francisco, CA [Block 1312-Lot 019], “Foundation Addition Retrofit”, letter-report prepared for Hart Howerton Architects, 1 page.

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