To: John Egan, PE, GE  
    Ron Hamburger, PE, SE  
    Phil Lovett  
    Kristin Gonsar

From: Debra Murphy, PE  
    Nathaniel Wagner, PE, PhD

Date: May 10, 2021  
Project Number: 19-009  
Subject: 301 Mission Retrofit Monitoring Report 001: Results as of May 7, 2021

CONTEXT

This memorandum summarizes results from the monitoring plan implemented at the 301 Mission property. Instrumentation to monitor the structure prior to, during and after the retrofit was installed in January 2021, including piezometers and extensometers. Settlement markers installed in April 2009 and January 2017, survey prisms mounted on the exterior of the structure in December 2016, and crack gauges installed in April 2009 have also been monitored.

INTERPRETATION

Figure 01 presents the instrument locations as referenced in later figures.

Figure 02 presents the historical settlement data interpreted from settlement markers installed on the B-1 Level of 301 Mission Tower. In addition, data from surveys performed during the retrofit are included.

Figure 05 presents historical lateral roof deflections in the project north-south and project east-west directions interpreted from survey prisms mounted on the exterior of the Tower, from InSAR data, and from a planar fit of the settlement marker data. In addition, data from survey performed during the retrofit are included.

Figure 07 presents the historical groundwater elevation interpreted from piezometer readings at locations near 301 Mission. In addition, data from piezometers installed to monitor groundwater elevation during the retrofit are included.

Note that several figures are omitted for various reasons. Figures 03, 04 and 06 are omitted because the baseline readings of the settlement markers and exterior prisms have yet to be obtained since production pile installation has not commenced. Figures 08 and 09 are omitted because the piezometers have yet to be connected to the automatic data loggers. Figures 10, 11 and 12 are omitted because the baseline readings of the extensometers have yet to be obtained since production pile installation has not commenced.

CLOSING

Please contact us if you have any comments or questions, or if you would like to discuss the results presented in this memorandum.

FIGURES

Figure 01A – Instrument Location Map: Settlement Markers, Piezometers, Extensometers  
Figure 01B – Tower Survey Prism Location Schematic
Figure 02 – Historical Settlement Marker Data
Figure 05 – Historical Lateral Roof Deflection Data
Figure 07 – Historical Groundwater Elevation Measurements at Locations Near 301 Mission
2. WEST ELEVATION OF SURVEY PRISM INSTRUMENTATION

3. ROOF PLAN OF SURVEY PRISM INSTRUMENTATION

City and County of San Francisco, California

Project No: 19-009.00  Date: 5/10/2021  Created By: NBW  Checked By: DGM  Figure No: 001-01B

Tower Survey Prism Location Schematic

Millennium Tower Perimeter Pile Upgrade: Instrumentation Monitoring Data

Filepath: S:\SlateDrive - Documents\Projects_2019\00.00\19-009.00_Millennium Tower Retrofit\10_Construction\01_Monitoring Reports\TowerSoilWater\00_Figures\Fig_001-01B_Prism_Mag.grf
HISTORICAL SETTLEMENT MARKER DATA

Millennium Tower Perimeter Pile Upgrade: Instrumentation Monitoring Data
City and County of San Francisco, California

Figure No: 001-02

Settlement (in) vs Time (1/1/06 to 1/1/32)

- SM-09, SM-17, SM-21, SM-25, SM-29, SM-33, LE-04, LE-21
- SM-10, SM-18, SM-22, SM-26, SM-30, SM-34, LE-17, LE-23

City and County of San Francisco, California
HISTORICAL LATERAL ROOF DEFLECTION DATA

Millennium Tower Perimeter Pile Upgrade: Instrumentation Monitoring Data
City and County of San Francisco, California
HISTORICAL GROUNDWATER ELEVATION MEASUREMENTS
AT LOCATIONS NEAR 301 MISSION

Millennium Tower Perimeter Pile Upgrade: Instrumentation Monitoring Data
City and County of San Francisco, California