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Date: October 27, 2022
Project Number: 19-009
Subject: 301 Mission Retrofit Supplemental Monitoring Report 077: Results as of October 26, 2022

CONTEXT

This supplemental memorandum summarizes results from the monitoring plan implemented at the 301 Mission property following the process established in a letter from Simpson, Gumpertz and Heger (SGH) to the San Francisco Department of Building Inspection (SFDBI) dated March 23, 2022. Instrumentation to temporarily monitor the structure during the excavation and shoring project phases was installed on April 20, 2022, including survey prisms installed at approximately one floor level above grade on the exterior of the building. This supplemental memorandum is for review only. It only contains ongoing monitoring information. This supplemental memorandum does not contain recommendations based upon the ongoing monitoring information.

PRESENTATION OF DATA

Figure S-01 presents the locations of the survey prisms (including both control and target prisms) as referenced in later figures.

Figure S-02 presents the differential horizontal movement toward the excavation at survey prisms installed at approximately one floor level above grade on the exterior of the building, as well as the average in each of the project north-south and east-west direction, since April 26, 2022, through October 26, 2022. Limits established in the aforementioned letter are included for reference.

Figure S-03 presents differential lateral roof deflection data due to shoring wall installation and excavation since April 26, 2022, through October 26, 2022. Limits established in the aforementioned letter are included for reference. Note that differential lateral roof deflection due to shoring wall installation and excavation is calculated following the aforementioned letter as:

$$\Delta_R = \Delta_{R-prism} - \Delta_H - \alpha T$$

where: Δ_R is the computed differential lateral roof deflection due to shoring wall installation and excavation;
$\Delta_{R-prism}$ is the differential lateral roof deflection obtained from prism data;
Δ_H is the average differential horizontal movement “at-grade”;
α is the weekly lateral roof deflection rate (computed as described below); and,
T is the number of weeks since initiation of shoring wall installation or excavation.

The time frame over which α is computed changes depending on the phase of the work, as specified in the aforementioned letter. For the construction phase during which the shoring wall is installed (currently ongoing), α is computed from the two months of monitoring conducted immediately prior to the shoring wall installation (i.e., monitoring data from February 22, 2022, through April 25, 2022). During the excavation phase (to occur in the future), α will be readjusted to reflect the recorded lateral roof deflection rate in the two months immediately preceding the start of excavation (dates to be determined).

Figure S-04 presents rates of differential lateral roof deflection data due to shoring wall installation and excavation since April 26, 2022, through October 26, 2022. Limits established in the aforementioned letter are included for reference. Note that the rates are calculated as:

$$\frac{d\Delta_R}{dT} \approx \frac{\Delta_{R,t} - \Delta_{R,t-1}}{T_t - T_{t-1}}$$

where: t is an index representing the current instance in time; and
$t - 1$ is an index representing the previous instance in time.

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 S-01A – Instrument Location Map: Horizontal Survey Control and Target Points at First Level
Figure S-02 – Differential Horizontal Movement Toward Excavation Since 04/26/2022 through 10/26/2022
Figure S-03 – Differential Lateral Roof Deflection Data due to Shoring Wall Installation and Excavation since 04/26/2022 through 10/26/2022
Figure S-04 – Rate of Differential Lateral Roof Deflection Data due to Shoring Wall Installation and Excavation since 04/26/2022 through 10/26/2022

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Project No. 0220-00383 HORIZONTAL TARGET EXHIBIT.dwg

EXHIBIT MAP
301 MISSION ST
COUNTY OF SAN FRANCISCO
STATE OF CALIFORNIA
APRIL 2022

Note: Image provided by Guida on 04/26/2022

Project No: 19-009.00	Date: 5/3/2022	Created By: NBW	Checked By: DGM	Figure No: **077S-01**

SLATE GEOTECHNICAL CONSULTANTS

INSTRUMENT LOCATION MAP
HORIZONTAL SURVEY CONTROL AND TARGET POINTS AT FIRST LEVEL

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

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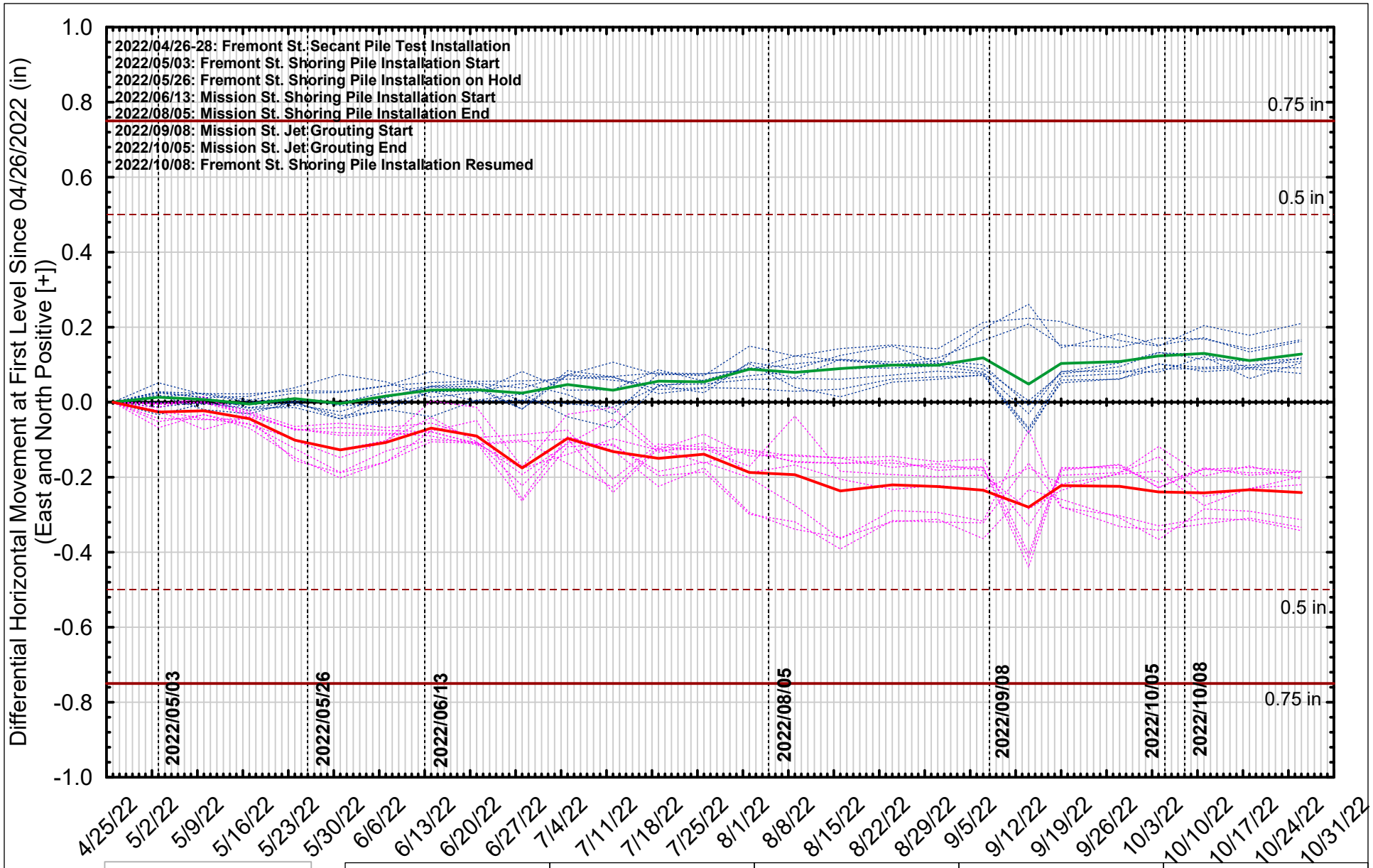

- Horizontal A Limit
- Horizontal B Limit
- Individual N-S
- Average N-S
- Individual E-W
- Average E-W

Project No: 19-009.00	Date: 10/27/2022	Created By: TB	Checked By: DGM	Figure No: **077S-02**

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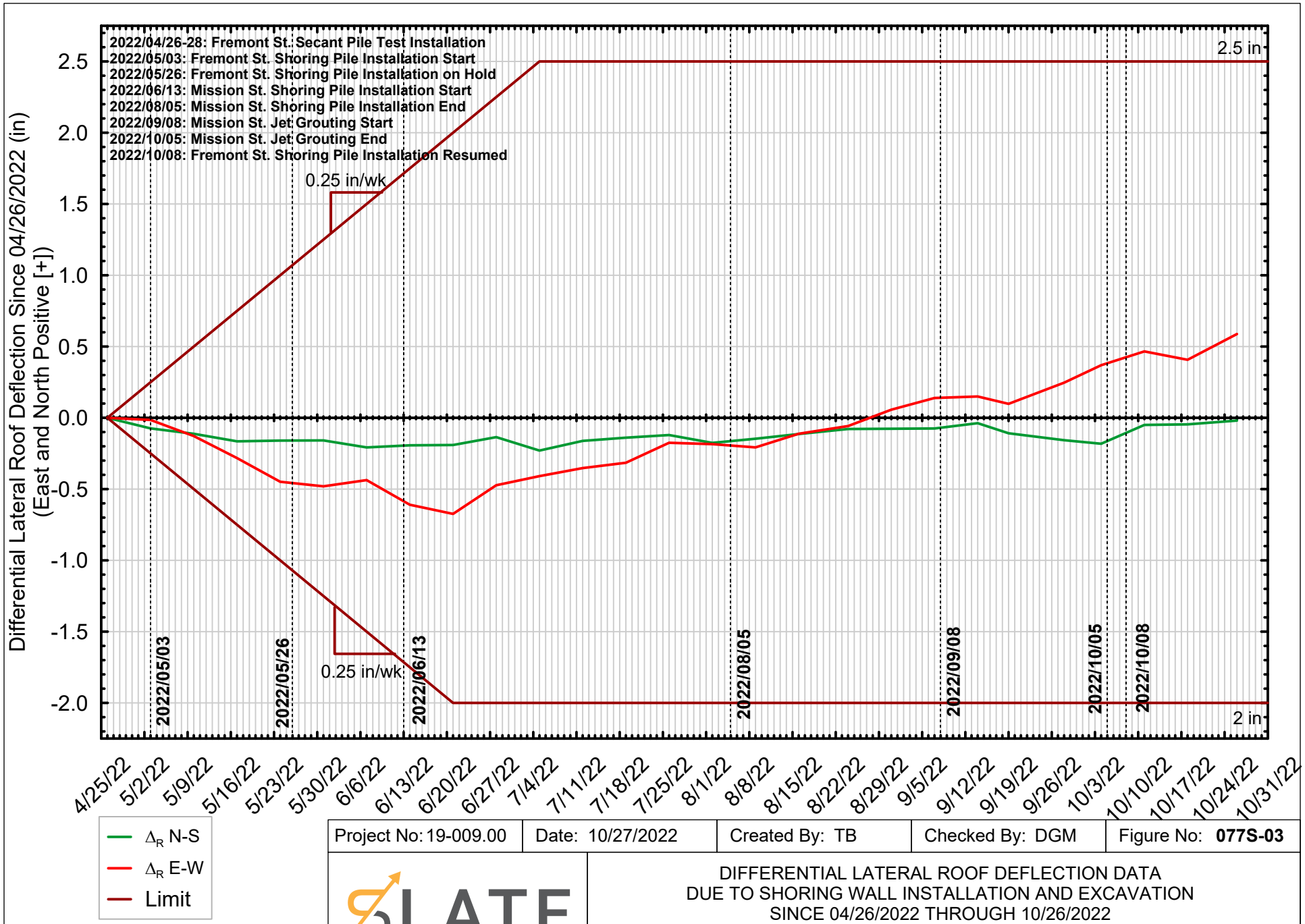
DIFFERENTIAL HORIZONTAL MOVEMENT TOWARD EXCAVATION
SINCE 04/26/2022 THROUGH 10/26/2022

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

Filepath: S:\SlateDrive - Documents_Projects_2019\19-009.00_Millennium Tower Retrofit\10_Construction\01_Monitoring Reports\TowerSoilWater\00_Figures\BuildingTranslation\Fig_077S-03_LatDef_Data_Diff.grf



Project No: 19-009.00	Date: 10/27/2022	Created By: TB	Checked By: DGM	Figure No: **077S-03**

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DIFFERENTIAL LATERAL ROOF DEFLECTION DATA
DUE TO SHORING WALL INSTALLATION AND EXCAVATION
SINCE 04/26/2022 THROUGH 10/26/2022
Millennium Tower Perimeter Pile Upgrade: Instrumentation Monitoring Data
City and County of San Francisco, California

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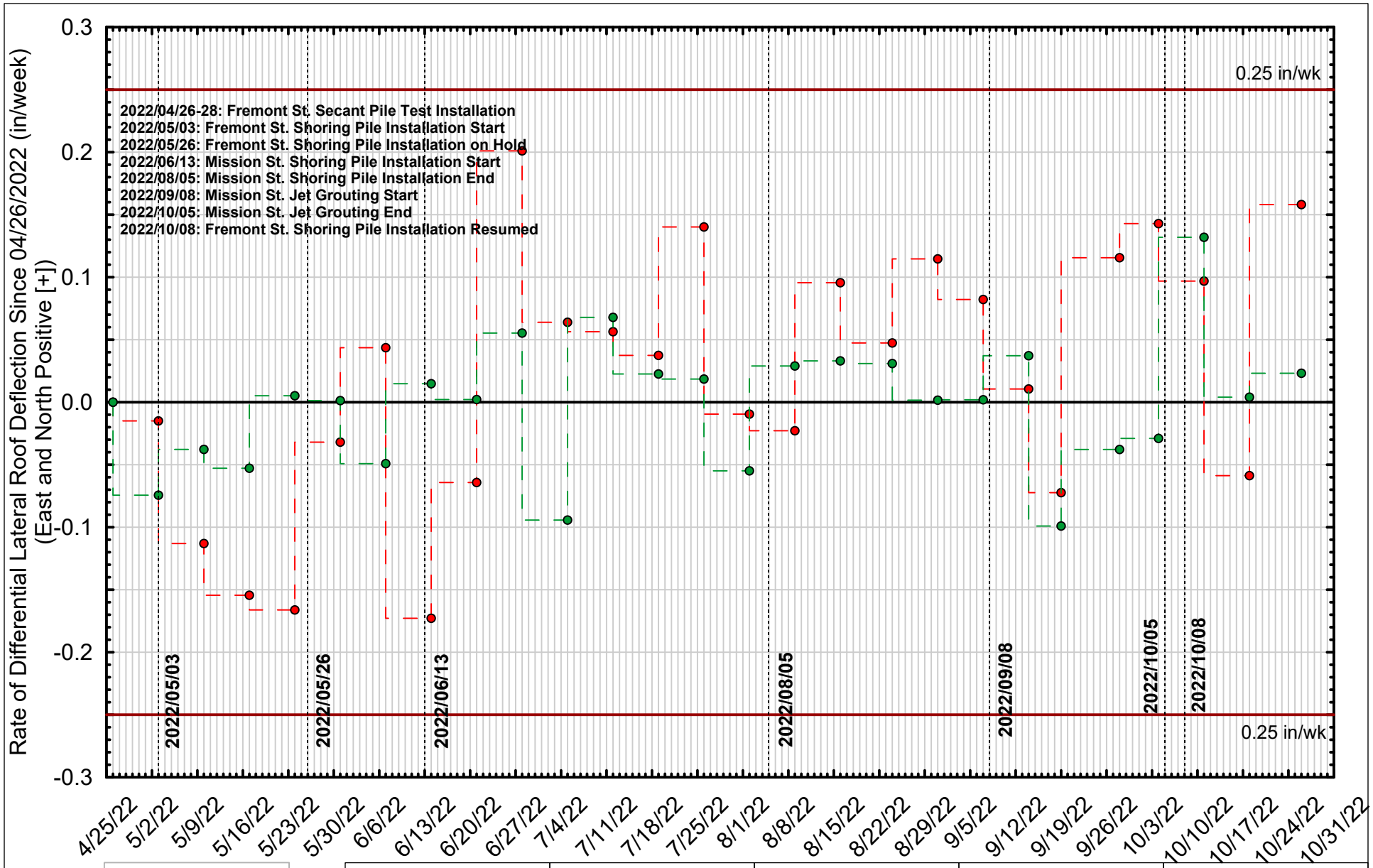

Rate of Δ_R E-W

Rate of Δ_R N-S

Limit

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RATE OF DIFFERENTIAL LATERAL ROOF DEFLECTION DATA
DUE TO SHORING WALL INSTALLATION AND EXCAVATION
SINCE 04/26/2022 THROUGH 10/26/2022
Millennium Tower Perimeter Pile Upgrade: Instrumentation Monitoring Data
City and County of San Francisco, California