

PRECONSTRUCTION BACKGROUND VIBRATION MONITORING SUMMARY REPORT

**VIRGINIA AVENUE TUNNEL RECONSTRUCTION PROJECT
WASHINGTON, DC**

**Prepared for:
CSX Transportation**

**Prepared by:
Gannett Fleming Inc.**

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VIRGINIA AVENUE TUNNEL RECONSTRUCTION

Preconstruction Background Vibration Monitoring Summary

Gannett Fleming Inc. (GFI) has prepared this background vibration monitoring report as part of the ongoing efforts to comply with the commitments presented in the Virginia Avenue Tunnel Reconstruction Final Environmental Impact Statement (FEIS) and Section 4(f) Evaluation (May, 2014) and further detailed in the Record of Decision (ROD), November, 2014. CSX Transportation, the project sponsor, has agreed to a number of environmental commitments as mitigation for environmental impacts that will result from the Virginia Avenue Tunnel Reconstruction Project. The commitments are divided between those related to construction of the Project and those related to the restoration of affected areas upon project completion of the Selected Alternative. These environmental commitment measures are mitigations which avoid the impact altogether by not taking a certain action or parts of an action; minimize impacts by limiting the degree or magnitude of the action and its implementation; rectify the impact by repairing, rehabilitating, or restoring the affected environment; reduce or eliminating the impact over time by preservation and maintenance operations during the life of the action; or compensate for the impact by replacing or providing substitute resources or environments. This preconstruction background vibration monitoring summary report is intended to fulfill initial aspects of the vibration monitoring commitments contained in the ROD for the Virginia Avenue Tunnel reconstruction.

GFI has installed perimeter vibration monitoring stations adjacent to various buildings within the Project limits. These monitoring stations are intended to monitor construction vibration associated with the Project. Construction vibration will be monitored throughout the Project's construction period. Highly sophisticated monitoring devices have been installed at eight locations to ensure the construction activities are performed in compliance with the permitted vibration levels. The monitoring devices will record the vibration level and automatically report the data back to the Project Engineers.

Methodology of Preconstruction Vibration Monitoring

Preconstruction vibration data was collected from late February, 2015 to mid-April, 2015 at seven of the eight monitoring station. The seven fixed vibration monitoring locations were measured for two (2) weeks to determine the preconstruction ambient vibration conditions. Vibration data was collected every minute for the duration of the vibration monitoring period. The locations of the seven vibration monitoring stations are depicted in Figure 1 and the addresses described in Table 1.

Figure 1. Vibration Monitoring Locations

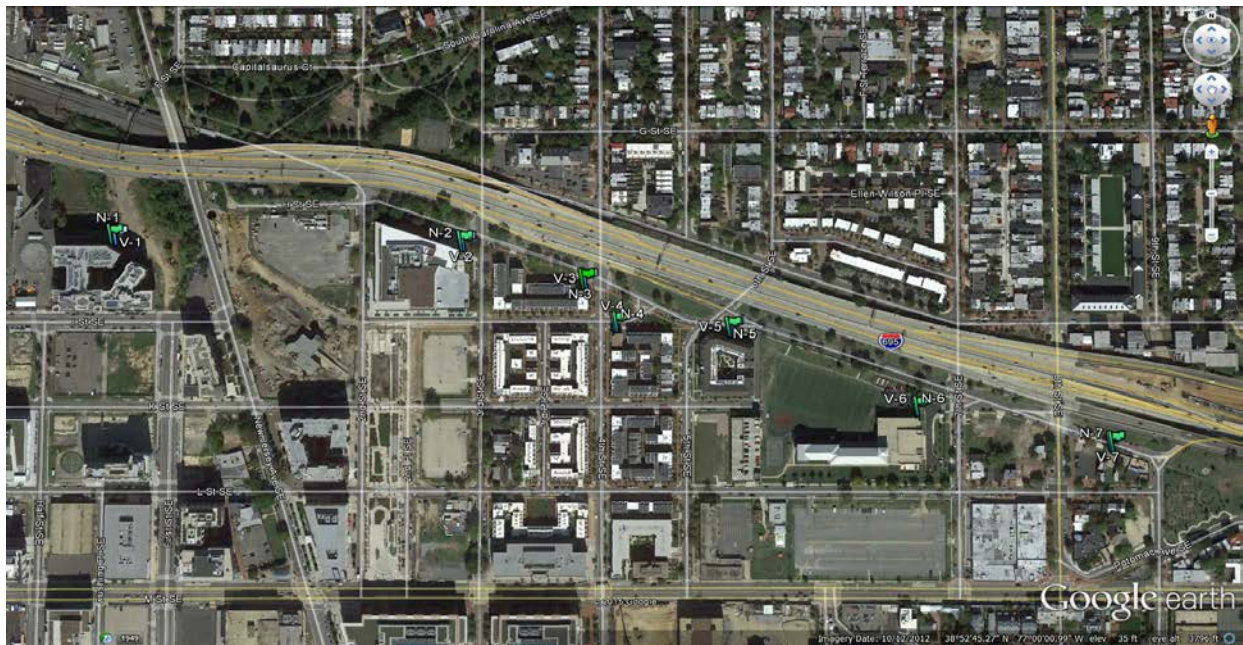


Table 1. Vibration Monitoring Locations Description

Site ID	Vibration Monitoring Location
V1	West of New Jersey Avenue SE
V2	Corner of 3 rd Street and Virginia Avenue SE
V3	Between 3 rd Street and 4 th Street SE, in front of Townhomes
V4	Corner of 4 th Street and I Street SE
V5	Corner of 5 th Street and Virginia Avenue SE, in front of Capper Senior Apartments
V6	Adjacent to fence of Marine Corp Recreation Facility on 6 th Street SE
V7	In front of Building on 7 th Street SE

Vibration Data Summary Charts

Table 2 presents the results of the vibration levels measured during the 14-day preconstruction period. These results are plotted in Figure 2 and show how the measured levels compare to the established vibration criteria. As shown below, Station V1 levels are higher as compared to the other locations, because of the nearby pile driving activities at an adjacent construction site.

As noted above, vibration monitors were deployed in eight locations along with noise monitoring devices. Station V8 is located in the middle of the Virginia Avenue Park. Since there are no buildings or structures within the park, there are no applicable vibration criteria for these open lands and therefore no vibration results are displayed in Table 2 for this location [Note that noise monitoring results for this site and the other seven locations are presented in the Preconstruction Background Noise Monitoring Report.] Prior to construction, Station V8 will be moved closer to the intersection of 10th Street SE and L Street SE and vibration data will be reported and compared with the appropriate vibration criteria for structures.

Table 2. Preconstruction Vibration Monitoring Results^a

Site ID	Vibration Monitoring Location	Preconstruction Monitoring		
		Lv (VdB)	Criteria ^{b,c} (VdB)	Exceedance (Yes/No)
V1	West of New Jersey Avenue SE	88	102 ^d	No
V2	Corner of 3 rd Street and Virginia Avenue SE	73	102 ^d	No
V3	Between 3 rd Street and 4 th Street SE, in front of Townhomes	74	98 ^e	No
V4	Corner of 4 th Street and I Street SE	73	90 ^f	No
V5	Corner of 5 th Street and Virginia Avenue SE, in front of Capper Senior Apartments	76	94 ^g	No
V6	Adjacent to fence of Marine Corp Recreational Facility on 6 th Street SE	72	94 ^g	No
V7	In front of Building on 7 th Street SE	74	94 ^g	No

- a. Table 2 has been revised from the previous version of this report to update the criteria based on new information of the building construction material and to update the vibration level based on the adjustment to the crest factor in accordance with FRA publication listed below
- b. Federal Railroad Administration (FRA). *CREATE Noise and Vibration Assessment Methodology*. December 2007.
- c. Federal Transit Administration (FTA). *Transit Noise and Vibration Impact Assessment*. U.S. Department of Transportation Report No. FTA-VA-90-1003-06, May 2006.
- d. Reinforced- concrete, steel or timber (no plaster)
- e. Engineered Concrete and masonry (no plaster) buildings
- f. Buildings extremely susceptible to vibration damage
- g. Non-Engineered timber and masonry buildings

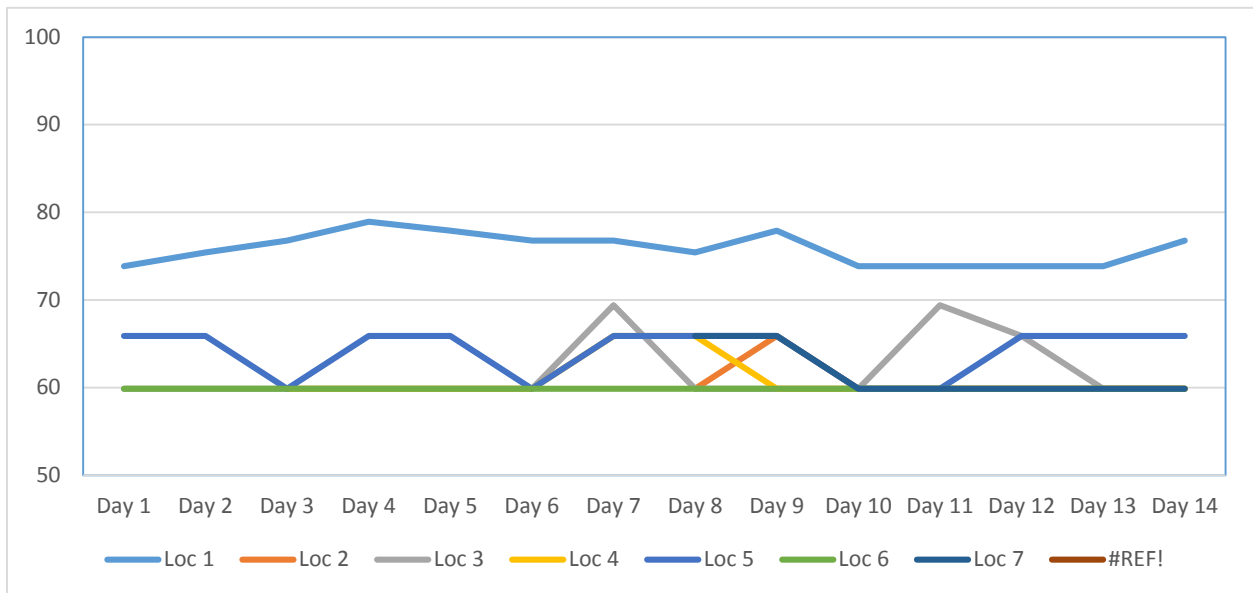


Figure 2. Summary of Preconstruction Background Vibration Monitoring Data (VdB)