

**CONSTRUCTION VIBRATION MONITORING SUMMARY REPORT**

**MARCH 1- MARCH 31, 2016**

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

**Prepared for:  
CSX Transportation**

**Prepared by:  
Gannett Fleming Inc.**

**March 2016**

# **VIRGINIA AVENUE TUNNEL RECONSTRUCTION**

## **Construction Vibration Monitoring Summary**

Gannett Fleming Inc. (GFI) has prepared this 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 construction vibration monitoring summary report is intended to fulfill aspects of the vibration monitoring commitments contained in the ROD for the Virginia Avenue Tunnel reconstruction.

The Project Team 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. 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 Construction Vibration Monitoring**

Construction vibration level data was collected for the reporting period starting March 1 through March 31, 2016. Eight fixed vibration monitoring locations have been measured continuously to monitor vibration levels since the beginning of major construction activities in May 2015. Vibration level data was collected every minute for the duration of the vibration monitoring period. The locations of the 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 <sup>rd</sup> Street and Virginia Avenue SE                                       |
| V3      | Between 3 <sup>rd</sup> Street and 4 <sup>th</sup> Street SE, in front of Townhomes           |
| V4      | Corner of 4 <sup>th</sup> Street SE and I Street SE   |
| V5      | Corner of 5 <sup>th</sup> Street and Virginia Avenue SE, in front of Capper Senior Apartments |
| V6      | Adjacent to fence of Marine Corp Recreational Facility on 6 <sup>th</sup> Street SE           |
| V7      | In front of Building on 7 <sup>th</sup> Street SE   |
| V8      | Corner of 10 <sup>th</sup> Street SE and L Street SE  |

### Vibration Data Summary Charts

Table 2 presents the results of the maximum vibration levels measured during the month of March 2016 and shows how the measured levels compare to the established vibration criteria. The average daily vibration level results are plotted in Figure 2. An exceedance of the vibration criteria was recorded during construction and pile drilling activities at Locations V2 and V4. However, the infrequent rate of occurrence (two times during the month) and the short duration of the events (1 to 3 seconds) are not expected to cause damage to any of the nearby structures at Locations V2 and V4.

**Table 2. Construction Vibration Monitoring Results – March 2016**

| Site ID | Vibration Monitoring Location   | Construction Monitoring |                               |                     |
|---------|---|-------------------------|-------------------------------|---------------------|
|         |   | Max. Lv (VdB)           | Criteria <sup>a,b</sup> (VdB) | Exceedance (Yes/No) |
| V1      | West of New Jersey Avenue SE  | 95                      | 102 <sup>c</sup>              | No                  |
| V2      | Corner of 3 <sup>rd</sup> Street and Virginia Avenue SE                                       | 105                     | 102 <sup>c</sup>              | Yes                 |
| V3      | Between 3 <sup>rd</sup> Street and 4 <sup>th</sup> Street SE, in front of Townhomes           | 98                      | 98 <sup>d</sup>               | No                  |
| V4      | Corner of 4 <sup>th</sup> Street SE and I Street SE   | 93                      | 90 <sup>e</sup>               | Yes                 |
| V5      | Corner of 5 <sup>th</sup> Street and Virginia Avenue SE, in front of Capper Senior Apartments | 90                      | 94 <sup>f</sup>               | No                  |
| V6      | Inside the fence of Marine Corp Recreation Facility on 6 <sup>th</sup> Street SE              | 91                      | 94 <sup>f</sup>               | No                  |
| V7      | In front of Building on 7 <sup>th</sup> Street SE   | 91                      | 94 <sup>f</sup>               | No                  |
| V8      | Corner of 10 <sup>th</sup> Street SE and L Street SE  | 83                      | 94 <sup>f</sup>               | No                  |

- a. Federal Railroad Administration (FRA). *CREATE Noise and Vibration Assessment Methodology*. December 2007.
- b. Federal Transit Administration (FTA). *Transit Noise and Vibration Impact Assessment*. U.S. Department of Transportation Report No. FTA-VA-90-1003-06, May 2006.
- c. Reinforced- concrete, steel or timber (no plaster)
- d. Engineered Concrete and masonry (no plaster) buildings
- e. Buildings extremely susceptible to vibration damage
- f. Non-Engineered timber and masonry buildings

**Figure 2. Summary of Construction Vibration Monitoring Data (VdB) – March 2016**

