



Department of
Design and
Construction

PART 1 | Introduction Monthly Reports

Air Quality, Noise and Vibration Monitoring

NYC Borough-Based Jails Program
A Design-Build Program

Program Wide

Last Updated 10/27/2022

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I. Introduction

The Borough-Based Jails Program

New York City has embarked on the biggest justice reform effort in its history, expressed in one of the largest public works projects it has undertaken in decades.

The City has committed to closing the detention centers on Rikers Island and building four new smaller, safer and fairer borough-based detention centers at a time when New York City has the lowest crime and incarceration rates of any large city in the United States. This is part of a once in many generations opportunity to build a smaller and more humane justice system that is grounded in dignity and respect, offering better connections to and space for families, attorneys, courts, medical and mental health care, education, therapeutic programming, and service providers.

The construction must realize these values through innovative and high-quality design that will foster safety and well-being for those incarcerated, their families, and staff, through normalized environments. It must be a beacon of high-quality civic architecture that integrates into the immediate neighborhood context and is an asset to all New Yorkers. The City will build four modern, humane facilities in the Bronx, Brooklyn, Manhattan, and Queens by 2027 that will house no more than 3,300 people. The land use actions were approved by the City Council in October 2019, and preparation included stakeholder engagement, community outreach, and the completion of an Environmental Impact Statement (EIS). For more information visit:

<https://rikers.cityofnewyork.us/city-environmental-quality-review/>

The Borough-Based Jails Program (BBJP) will be executed under a Design-Build project delivery method whereby the City manages only one contract/team per project (a design-builder) with a single point of responsibility for both design and construction services. The designer and construction contractor are on the same team and work together from the beginning, providing unified design and construction services to fit the owner's project requirements, schedule and budget. The result is a more cost-efficient project with a shorter timeline from design initiation to completion. The Department of Design and Construction (DDC) is awarding a separate Design-Build contract for each of the four detention facilities, as well as early works packages at all four sites, resulting in nine contracts:

- The Bronx: site preparation contract, new facility contract
- Brooklyn: dismantle/interim sally port contract, new facility contract
- Manhattan: dismantle/ interim sally port contract, new facility contract
- Queens: garage contract, dismantle/ interim sally port space contract, new facility contract

The new facilities are anticipated to be in service for over 80 years and will be designed for efficient use of energy and low greenhouse gas emissions in alliance with NYC's low carbon goals and resilient to our climate-change-related risks of increased heat, increased precipitation, and sea level rise. For more information visit the project website at <https://rikers.cityofnewyork.us/>

II. BBJ Environmental Monitoring

Community health and safety are essential to the City of New York on any project. The Borough-Based Jails (BBJ) project team is committed to ensuring there is limited impact during our construction activities requiring the Design Builders not just to comply with environmental laws and regulations but go above and beyond the required New York State and City requirements, including a real-time monitoring plan for air quality, noise, and vibration at each of the sites.

Environmental monitoring will be performed during the dismantle, site preparation, and construction of the new facilities for the Borough Based Jails Program situated in the four sites described below:

- **Manhattan Site:** 124/125 White Street
- **Brooklyn Site:** 275 Atlantic Avenue
- **Queens Site:** 126-02 82nd Avenue
- **The Bronx Site:** 745 E. 141st Street



Fig.1 Project Sites

Environmental Alerts & Oversight:

The US Environmental Protection Agency (EPA) regulates air pollution by setting National Ambient Air Quality Standards, and the Occupational Safety and Health Administration (OSHA) sets acceptable limits for workplace exposure of air pollutant concentration levels called Permissible Exposure Levels (PEL). The NYC Department of Environmental Protection (DEP) and Department of Buildings (DOB) define noise and vibration level standards and limits.

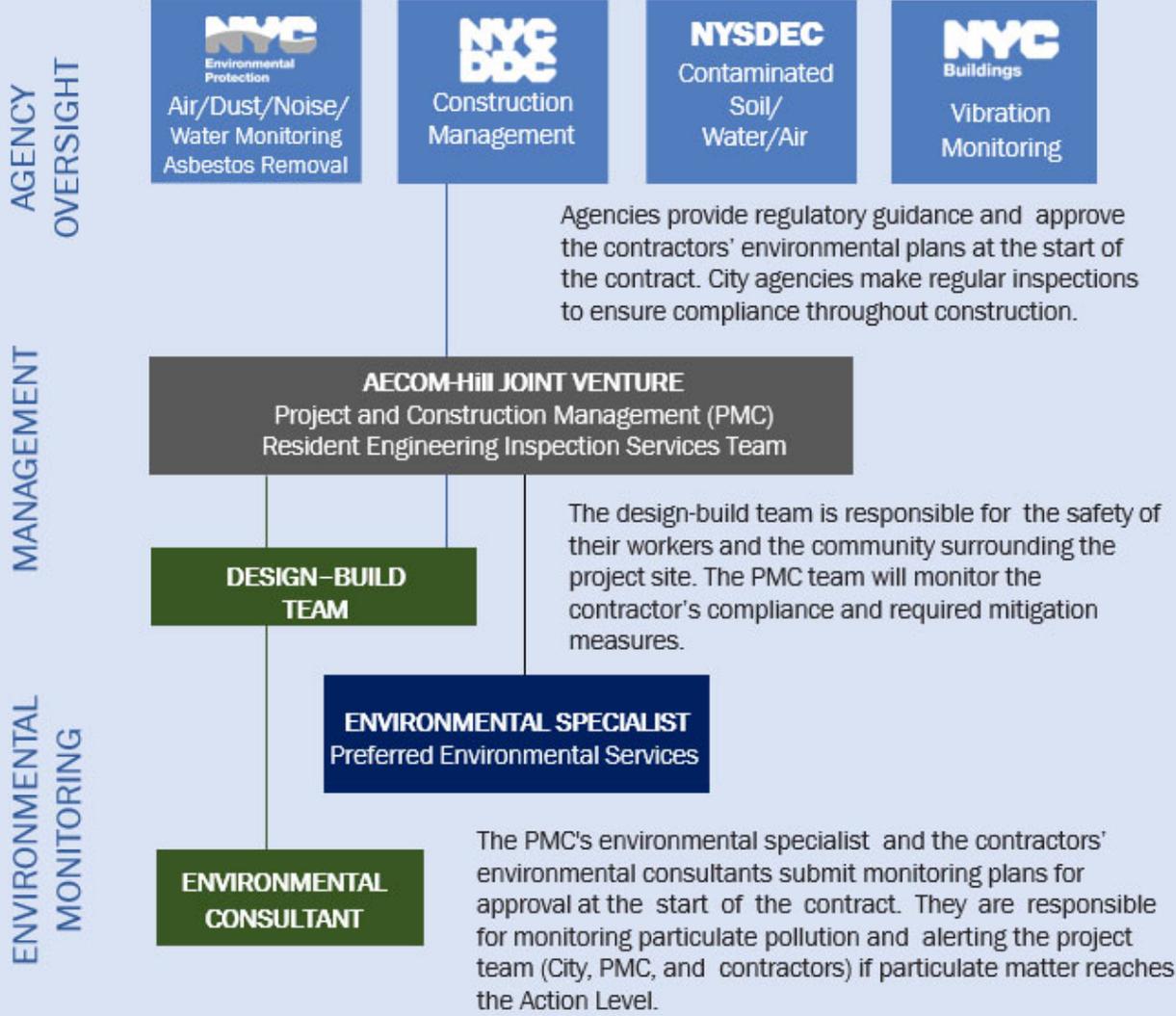
The BBJ Construction Management Team, Project Contractors and Environmental Specialists receive real-time alerts when Particulate Matter (PM), decibels (dBA), or velocity of vibration (ips) numbers approach an Action Level. The Action Level is set below the respective standard/limits as noted. When Action Levels are reached, the construction activities are assessed, and the contractor immediately acts to apply steps to evaluate the source and follow steps to mitigate.

The BBJ team provides Environmental Monitoring updates at quarterly Neighborhood Advisory Committee (NAC) meetings and posts the BBJ Monthly Environmental Monitoring Reports on the website for the public to review. For more information, submit an inquiry to our borough-specific Community Construction Liaison. <https://rikers.cityofnewyork.us/>.

Environmental monitoring began in August of 2022 for the Brooklyn, The Bronx and Manhattan sites and due to the nature of the work is expected to begin in November of 2022 for the Queens site and will continue throughout the life of the project.

Oversight Team

Oversight for the environmental monitoring program is multi-tiered and includes checks and balances between several agencies and entities.



While the BBJ Team has been tasked to monitor Air Quality, Noise and Vibration around our construction activities, we do understand there are many other impacts affecting air quality in the City. Residents should follow all **Notify NYC** Advisories: <https://a858-nycnotify.nyc.gov/>

Fig.2 Oversight Team

III. Air Quality Monitoring

The BBJ team will be conducting air quality monitoring throughout construction at all four sites to ensure the ongoing health and safety of the adjacent community. In particular, the BBJ Air Quality Monitoring program will measure levels of Particulate Matter (PM) for PM10 size as well as atmospheric conditions. The Air quality section of the monthly reports will summarize the Particulate Matter (PM) readings collected by the environmental subconsultant to each Project¹.

What is Particulate Matter (PM) and how is it measured?

As described by the [Environmental Protection Agency](#), PM stands for particulate matter (also called particle pollution): the term for a mixture of solid particles and liquid droplets found in the air. Some particles, such as dust, dirt, soot, or smoke, are large or dark enough to be seen with the naked eye. Others are so small they can only be detected using an electron microscope. Particle pollution includes:

PM10: inhalable particles, with diameters that are generally 10 micrometers and smaller.

Sources of PM: These particles come in many sizes and shapes and can be made up of hundreds of different chemicals. Some are emitted directly from a source, such as construction sites, unpaved roads, fields, smokestacks, or fires. Most particles form in the atmosphere as a result of complex reactions of chemicals such as sulfur dioxide and nitrogen oxides, which are pollutants emitted from power plants, industries, and automobiles.

The Clean Air Act requires EPA to set national air quality standards for particulate matter, as one of the six criteria pollutants considered harmful to public health and the environment. The law also requires EPA to periodically review the standards to ensure that they provide adequate health and environmental protection, and to update those standards as necessary. National Ambient Air Quality Standards (NAAQS) for PM pollution specify a maximum amount of PM to be present in outdoor air.

Limiting PM pollution in the air protects human health and the environment. Currently, the EPA has established standard to protect both public health and welfare for PM10 (24-hour average concentration level of 150 µg/m³ not to be exceeded more than once per year on average over 3 years).

The table here illustrates the Permissible Exposure Limit (PEL) and Action Levels (AL) for net PM10 concentrations over a 24-hour Time Weighted Average (TWA):

	Action Level (AL) over a 24-hour TWA	Permissible Exposure Limit (PEL) over a 24-hour TWA
PM10	100µg/m ³	150µg/m ³

Monitoring machines placed strategically along the edge of active construction activities measure PM from construction equipment emissions and dust as well as site meteorology conditions such as wind direction and speed. Some instruments monitor existing conditions and others measure the potential

¹ For the Queens site, given the further distance from the closest structure and residential community (sensitive receptors), air quality, noise, and vibration monitoring will be performed during the most impactful work milestones, such as sheet piling, and excavation activities.

increase of PM concentrations from construction. Through careful monitoring with real-time alerts, the team knows when additional control measures are needed during construction to protect air quality for residents. If the construction is not meeting the requirements set by the oversight agencies, work may be halted, and an assessment will be made to protect residents.

Along with air quality monitoring, the contractor is required to take extensive preventative measures to control dust and limit construction equipment emissions. Potential mitigation techniques include but are not limited to:

- Implement a watering program to minimize dust emissions.
- Use newer and cleaner equipment.
- Install fence around construction area to serve as a buffer between emission sources and nearby sensitive receptors.

How to read air quality monitoring data plots:

The PM readings in monthly reports will include data plots similar to the one shown below. The data plots illustrate **Net Particulate Matter (Net PM)** levels (blue line on data plot) in a **15-minute Time Weighted Average (TWA)**. As mentioned above, the federal limits for PM exposure are evaluated on a **24-hour TWA**. By evaluating PM readings on the 15-minute TWA, the BBJ project can ensure that Net PM never exceeds the 24-hour TWA, or daily value.

Air Quality System #1- Dust Monitoring Station - September:

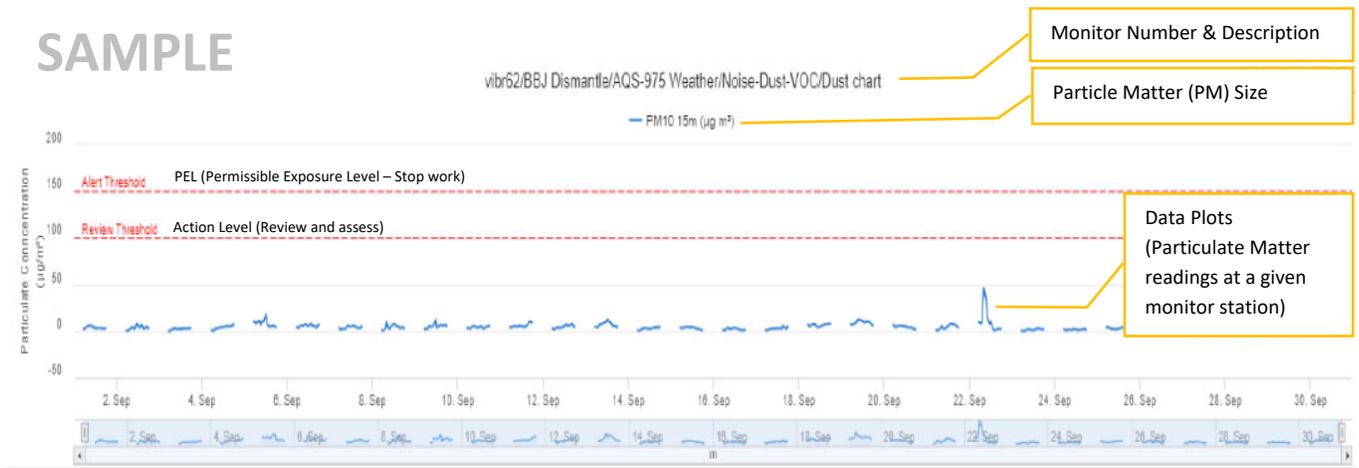


Fig.4 Sample Air Quality Monitoring Data Plot

Daily value for PM refers to the 24-hour average concentration of PM calculated or measured from midnight to midnight (local time).

An **exceedance** is a daily value that is above the level of the 24-hour time weighted average after rounding to the nearest 10 µg/m3 (i.e., values ending in 5 or greater are to be rounded up).

An **exceptional event** is an uncontrollable event caused by natural sources of particulate matter or an event that is not expected to recur at a given location. Inclusion of such a value in the computation of exceedances or averages could result in inappropriate estimates of their respective expected annual values.

An **outlier** is a data point on a graph or in a set of results that is very much bigger or smaller than the next nearest data point. For example, outliers among monitoring data can be due to instrument malfunctions, the influence of harsh environments, and the limitation of measuring methods.

The Action Level (AL) is the level set by the BBJ Air Quality Monitoring Plan, lower than the Permissible Exposure Limit (PEL), by where the contractor will be made aware of an increase in particulate matter before reaching the PEL, to begin to implement mitigation techniques. Automated alerts are dispatched to designated PMC (AECOM-Hill JV) personnel whenever the AL is exceeded.

The Permissible Exposure Limit (PEL) is a regulatory limit to protect public health/welfare set by the National Ambient Air Quality Standards (NAAQS) in line with the requirements of the Clean Air Act (CAA) on the amount or concentration of a substance in the air. The Environmental Protection Agency (EPA) has set a 24-hour time weighted average (TWA) as standard for evaluating Particulate Matter (PM) levels (Daily value).

Baseline or background data is the data measured before the construction shifts begin and throughout the day.

IV. Noise Monitoring

The BBJ team will be conducting noise monitoring throughout construction at all four sites to ensure the ongoing health and safety of the adjacent community. The Borough-Based Jails (BBJ) project team is ensuring that noise from construction will be intermittent and of limited duration, and total noise levels will not rise to the level of a significant adverse noise impact*. The BBJ requires the Design Builders not just to comply but go above and beyond the required New York State and City requirements. The noise section of the monthly reports will summarize the readings collected by the environmental subconsultant to each Project.²

Sound level meters are located on-site to monitor and ensure noise levels comply with New York City's noise codes (Local Law 113.) During construction maximum noise level cannot exceed the following:

- **7:00 AM to 6:00 PM weekday:** 80 A-weighted decibels (dBA) as measured 50 or more feet from the source or sources at a point outside the property line or on a public right-of-way.
- **6:00 PM to 7:00 AM and weekend, if a permit is obtained:** 70 dBA as measured 50 or more feet from the source or sources at a point outside the property line or on public right-of-way, or an increase of 7 dBA above ambient (baseline), whichever is higher.
- **During construction and/or container and material handling:** 10 dBA above the ambient level as measured at any point within a receiving property or as measured at 15 feet or more from the source on a public right-of-way.

What is being measured?

- **Decibels (dBA) level:** Adjusted measurement of noise that considers the sensitivity of the human ear to the various sound frequencies that we can hear. A normal conversation corresponds to 60 dB, a heavy traffic to 85 dB, and a concert to 120 dB.

*DEP defines significant adverse noise impact from temporary construction activities as the increase of

² For the Queens site, given the further distance from the closest structure and residential community (sensitive receptors), air quality, noise, and vibration monitoring will be performed during the most impactful work milestones, such as sheet piling, and excavation activities.

15 dBA or more for prolonged duration of twelve consecutive months or more or increase of 20 dBA or more for prolonged duration of 3 consecutive months or more at a noise sensitive receptor.

Steps and measures to monitor and control noise:

To ensure noise levels are respected, preventive measures are being taken during daily construction activities, and will be increased if monitoring devices indicate additional action is needed.

- Use mufflers on construction equipment (dump trucks, concrete mixers, excavation equipment, generators, trucks removing soil, etc.)
- Install noise monitoring stations distributed across the site.
- Perform initial background readings of all noise stations one week before construction activity in the area begins.
- Use absorbing materials placed around areas of noise generation (i.e., installing mass-loading vinyl or noise curtains.)
- Minimize truck idling or staging trucks within the site.
- Lowering debris into trucks in lieu of dropping.
- Utilize densifying attachments rather than impact hammers for slab dismantle.

How to read noise monitoring data plots:

The noise monitoring readings in monthly reports will include data plots similar to the one shown below. The data plots illustrate **Decibel's level (dBA) setting an alarm at 80 dBA** where the contractor will be made aware of an increase in noise before reaching higher levels, to begin to implementing mitigation techniques.

Air Quality Systems #1 – Noise Monitoring Station - September:

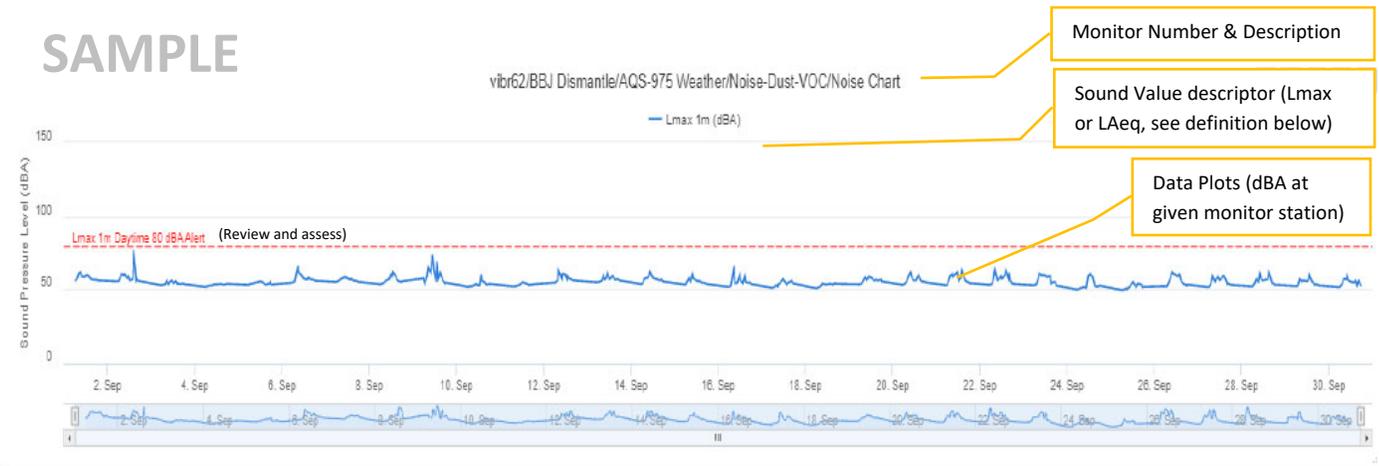


Fig.5 Sample Noise Monitoring Data Plot

Sound levels could be measured using the following descriptors:

Lmax or Maximum Sound Level is the highest sound level measured during a single noise event.

LAeq or A-weighted equivalent continuous sound level is the average received sound energy over time.

V. Vibration Monitoring

Based on environmental assessment and engineering analysis the projects are not expected to result in vibration at a level that could result in architectural or structural damage. The design-build team will maintain real-time vibration monitoring equipment that will be monitored and interpreted by the vibration consulting firm's personnel and monthly reports will be provided to the public. These monitoring devices will be placed strategically along the edge of active construction activities and monitor all structures within 90 feet of the Project Site with potential vibration impact from construction activities specifically for heavy equipment operations such as rock excavation, pile/lagging installation, etc.³

What is being measured?

- **Inches per second (in/sec):** Velocity of vibration is measured in peak units such as inches per second (ips), describing how fast a heavy spot moves through a cycle.
- Baseline/ Background level will be measured to provide reference for evaluating impacts

The NYC Department of Buildings (DOB) defines vibration level limits thresholds for historical structures at 0.5 in/sec exceedance level. **The BBJ program will set a warning level at 0.3 in/sec or more stringent for historical structures. For non-historical structures, the exceedance level is defined at 1 in/sec and warning level at 0.5 in/sec.**

Vibrations do not necessarily translate to structural damage. While you may feel vibrations, it does not mean there is damage or concern. The average person feels a vibration at around 0.1 millimeters (0.04 inch)/second which is fairly low. Vibrations that could cause structural damage need to have a substantially higher level. The project team is available if any questions arise.

Steps to monitor and reduce vibration during construction.

To ensure vibration levels are not impactful, preventive measures are being taken during daily construction activities, and will increase these measures if monitoring devices indicate additional action is needed.

- Cushioning items during dismantling
- Using appropriately sized equipment
- Lowering debris to the extent possible with a crane
- Removing debris in large pieces to another site to process rather than processing on-site
- Utilizing densifying attachments rather than impact hammers for slab dismantle
- Using smaller hand-held dismantle equipment in place of larger dismantle machines

How to read vibration monitoring data plots:

The vibration monitoring readings in monthly reports will include data plots similar to the one shown below. The data plots illustrate peak particle velocity (PPV) in inches per second (ips or in/s) and show thresholds for the warning level at 0.5 ips, where the contractor will be made aware to begin to implementing mitigation techniques. The exceedance levels is 1 ips for non-historical structures, where the contractor will stop work.

³ It should be noted that, at the Queens site, the closest sensitive structure is approximately 165 feet from the construction site. Therefore, vibration monitoring program would only be considered as necessary in those weeks with potential worst-case conditions when major excavation or impact pile driving activities occur.

Vibration Monitor - (R01) September:

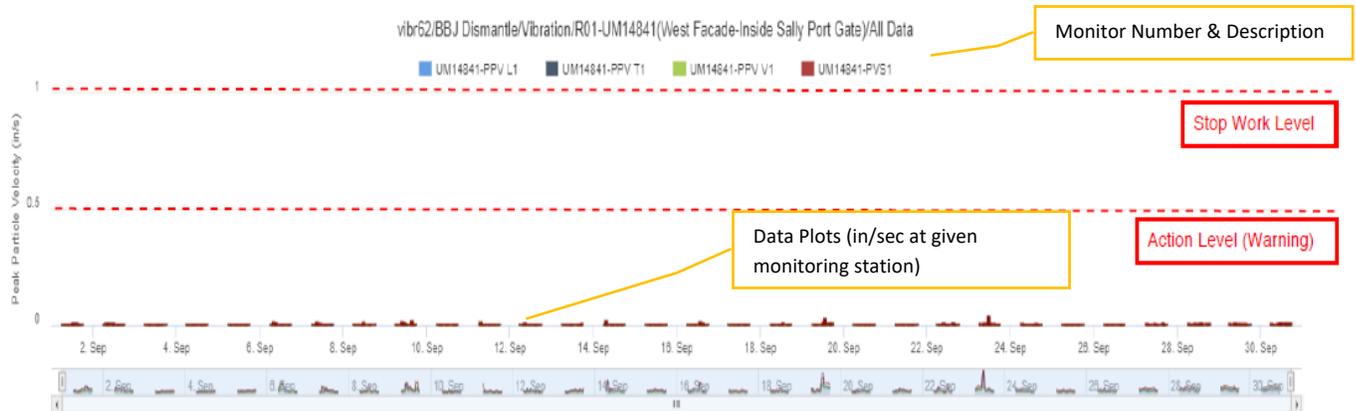


Fig.6 Sample Vibration Monitoring Data Plot

VI. Asbestos Abatement Air Monitoring

Air quality monitoring of the asbestos removal is occurring in addition to the community air monitoring (CAM) and is in place and ongoing throughout the asbestos removal process for all BBJ sites.

The monthly monitoring reports will not include readings regarding asbestos abatement air monitoring. For the asbestos abatement work, air samples will be collected in close proximity to the regulated work area as well as any other locations as may be required by the regulations, to monitor the potential airborne fiber concentration. If any air sample results are above 0.01 f/cc (the minimal level of airborne fiber concentration allowable), appropriate corrective action will be taken. The Design-Build team will follow all rules and protocols in accordance with both NYCDEP and NYS requirements and will monitor the air at all times that asbestos abatement activities are occurring. Please see links below for further information:

- [Asbestos Abatement, NYC DEP website](#)
- [Asbestos Rules and Regulations, Title 15, Chapter 1 of the Rules of the City of New York](#)

VII. Resources

- BBJ Website: <https://rikers.cityofnewyork.us/>
- BBJ Environmental Review Process web page: <https://a002-cegraccess.nyc.gov/ceqr/Details?data=MThET0MwMDFZ0&signature=e330cd9c78430a8d28b580b159a7183c6bd2b3d8>
- EPA Particulate Matter (PM) Pollution - Particulate Matter (PM) Basics: <https://www.epa.gov/pm-pollution/particulate-matter-pm-basics#PM>
- EPA Particulate Matter (PM) Pollution - Setting and Reviewing Standards to Control Particulate Matter (PM) Pollution: <https://www.epa.gov/pm-pollution/setting-and-reviewing-standards-control-particulate-matter-pm-pollution>
- EPA Particulate Matter (PM) Pollution - National Ambient Air Quality Standards (NAAQS) for PM: <https://www.epa.gov/pm-pollution/national-ambient-air-quality-standards-naaqs-pm>
- EPA Particulate Matter (PM) Pollution - Applying or Implementing Particulate Matter (PM) Standards: <https://www.epa.gov/pm-pollution/applying-or-implementing-particulate-matter-pm-standards>