



**King County**

Department of Natural Resources and Parks  
Wastewater Treatment Division

# NORTH MERCER ISLAND/ENATAI Sewer Upgrade Project

## Construction Vibrations: What is monitoring? Why is it needed?

### What's Happening... and Why

Vibration is the shaking motion caused by events or activities such as earthquakes, trucks, or machinery driving nearby. Vibration can also be caused by construction activities such as demolition, excavation, and compaction. A level of increased vibration is expected when using any large equipment or machinery during construction.

Vibration monitoring is a standard practice on many construction projects to help ensure that vibrations do not exceed levels (also known as thresholds) that could potentially cause damage to nearby utilities or structures.

This fact sheet explains potential causes for vibrations during construction and the tools the North Mercer Island/Enatai Sewer (NME) Upgrade project uses to monitor vibrations and address potential concerns from neighbors near active construction.

### Types of Vibration – Intermittent and Continuous

During construction, vibrations can travel through the ground and transmit through the foundations to nearby structures' walls, floors, and roofs. In general, humans will perceive vibrations at levels much lower than vibrations that will cause damage to a structure that is built to code. Feeling vibrations can cause alarm to many people, but it is rarely a risk to structures. Construction activities will stop immediately if vibrations are recorded at levels higher than the allowable thresholds. Then we adjust our approach to bring vibrations back to allowable limits. These limits are developed with local jurisdictions and are informed using standard metrics.

Most vibrations related to construction fall into two categories: continuous or intermittent.

### Continuous vibrations:

**Soil Compaction:** Soil compaction uses a machine that creates downward force and the machine's weight to compact soil after it has been added back to excavations or construction sites.

**Excavation:** Excavation involves digging into the ground below grade (below the ground surface level) and removing soil to make space for new pipes or other below-grade equipment.

**Tunneling or Horizontal Directional Drilling (HDD):** During horizontal directional drilling (HDD), the contractor uses a machine on the surface to drill an underground pathway for the new pipe and then pulls the pipe through the new path.

*King County is upgrading four miles of sewer pipeline across north Mercer Island and south Bellevue. It is a big project that has been years in the making and will involve years of construction. Project work will be in heavily used public spaces, and in some residential areas. While the work to get there may involve temporary inconveniences, the upgrade will provide great public benefit.*

*We are committed to keeping you informed about what's happening and why. This is one of a series of fact sheets that explain the North Mercer/Enatai (NME) Sewer Upgrade Project and what the public can expect—during construction and after the work*



Soil Compaction



Tunnelling

### **Intermittent vibrations:**

**Pavement Breaking:** Crews use a saw to break up the pavement at joints to create concrete slabs. Then they strike the concrete repeatedly using a jackhammer to loosen and remove pre-cut pavement slabs.

**Soldier Pile Installation:** Pile installation is a technique where crews push steel beams or concrete piles deep into the ground. These beams can act as support or foundations for structures built around or on top of them.

### **How does King County prepare for vibration during construction?**

King County prepares for potential vibrations during all capital projects' design, pre-construction, and construction phases.

**During design,** we work with local jurisdictions to establish the vibration thresholds for our project areas. Standard vibration thresholds and measurements used in the United States inform acceptable vibration thresholds during construction. These thresholds are written into the permits that the contractors follow to complete all construction work.

**During pre-construction,** the contractor does surveys of structures and buildings near the work area. These surveys help document existing site conditions before work starts and help King County evaluate potential damage claims and concerns during construction.



*Pavement breaking*



*Pile Driving*



**During construction,** vibration monitors are installed and checked daily. For the North Mercer Enatai project, we have monitors onsite at all work areas and portable vibration monitors that can be moved around to help monitor vibrations and potential vibration concerns.

### **Request an evaluation during construction**

If you believe that vibrations from construction are causing damage to your home or property, please contact the Community Services team. Call or text 425-305-3578 or email [NMEsewer@kingcounty.gov](mailto:NMEsewer@kingcounty.gov).

## **NORTH MERCER ISLAND/ENATAI**

## **Sewer Upgrade Project**

**Talk to us!** For more information or to schedule a virtual meeting, please contact:

The community services team at **425-305-3578** or [NMEsewer@kingcounty.gov](mailto:NMEsewer@kingcounty.gov)

Sign up for text alerts. Text **KING MERCERSEWER** to **468-311**.



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ALTERNATE FORMATS AVAILABLE  
206-477-5371 OR TTY REPLY: 711