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December 2018

# 2018 Pile Driving Report

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## Executive Summary

The Portland City Noise Code incorporates a convention exempting a series of construction equipment from having any specific sound limitations or decibel level limits when operated during the daytime.

This convention was established with the understanding that many pieces of equipment are not practical to install or engineer sound abatement methods to help protect the public from the loudest forms of construction.

This applicable section of the Title 18 Noise Control states:

### *“18.10.060 Construction Activities and Equipment*

**A. Maximum sound levels:** No person shall operate any equipment or appurtenances thereto in commercial construction activities which exceeds 85 dBA, when measured at 50 feet (15.2 meters) from the source. **This standard shall not apply to trucks (see Section 18.10.020), pile drivers, pavement breakers, scrapers, concrete saws and rock drills.”**

The Noise Office first learned about noise impacts from pile driving in 2014, when a group of Pearl District residents began contacting the Noise Office about how they were impacted by pile driving construction. Since then, the Noise Office has spent an estimated 400 hours of staff time to explore the issue in more detail including:

- Conducting research
- Holding meetings
- Investigating complaints
- Hearing testimony
- Interacting with residents, contractors, developers, and union tradespeople
- Participating in the Noise Task Force convened by Commissioner Fritz

Additionally, City Council explored this issue and placed time limitations and public notification requirements for construction projects using pile driving. Through research and discussions with construction and geotechnical professionals, the Noise Office found no current engineered solutions, acoustic damping accessories or safe noise mitigation applications that were tested and ready to be incorporated into City Code or into the process of noise variance reviews by staff and the Noise Review Board. **As a result, the Noise Office does not recommend removing the current exemption on pile driving as a noise source in Title 18.**

## **Noise Office Pile Driving Overview**

The following section provides an overview of the pile driving issue and how the Noise Office has responded to addressing the issue over the last four years.

Number of projects and complaints related to driven pile in Portland:

- Between 2014 and 2017, there were 17 projects within city limits that used driven pile (grout and pipe).
- Out of these projects, one (Block 17 in the Pearl District) garnered 27 complaints to the Noise Office.
- Daimler (Swan Island) garnered one complaint and two phone queries.

In addition, six other complaints were received from callers around the city that mentioned pile driving. However, from the data received from complainants, there were no pile driving projects occurring on those dates anywhere in the city at the time of the complaints.

### **Locations and Number of Pile Driving Construction Projects:**

- South Waterfront - 2
- Portland Airport - 3
- Pearl District - 3
- Rocky Butte - 1
- North Portland – Swan Island - 1
- Portland Expo Center - 1
- Union Pacific Railway – East Portland (NE 2<sup>nd</sup>) - 1
- North Portland – Portland Water - 1
- SW Capitol – 1
- SE 2<sup>nd</sup> – 1
- NE 28<sup>th</sup> & Weidler – 1
- SE Water & Stark – 1

## **Sources and Data Collection Methods**

### **A list of sites was identified using:**

- A list of pile driving projects in Portland between 2014 and 2017 received from deep foundation contractors.
- Crossed referencing times/locations with complaints in TRACS (Noise Office software system).
- Crossed referencing phone logs (all calls received and the nature of the complaint/query) from all Noise Office OSSIs during this same time-period.
- Exporting Track-Its (online complaint system) into an Excel spreadsheet and filtered by type of complaint.

## **Meetings & Outreach**

To reach a wide variety of experts, the Noise Office used targeted outreach through phone calls and emails to groups representing deep foundation setting, general contractors, developers and union labor. Outreach was also conducted through the Noise Office mailing list, Noise Office website, and public notices in the newspaper.

The Noise Review Board held eleven meetings with pile driving on the agenda, including an October 2014 panel discussion of construction professionals consisting of the following industry professionals:

- Geotechnical Engineers - Scott Mills (Geo Design) and Jason Butler-Brown (Bureau of Development Services)
- General Contractor - Phil Dobbs (Hoffman Construction)
- Foundation Professionals:
  - Rory Martindale (DeWitt Construction)
  - Garth Ullakko (DeWitt Construction)
  - Ty DeWitt (DeWitt Construction)
  - Jim Brunkhorst (Pacific Foundations).

This was followed in November 2014, with more testimony and examples of regulations in other cities. Participants included:

- Pearl District residents
- Staff from DeWitt Construction
- Members of Pile Drivers Local 197

Two additional meetings were held in March 2015 and April 2015 to discuss a possible change to Title 18, and to take public testimony on the recommendation.

During other Noise Review Board meetings that did not include pile driving on the agenda, the board heard public testimony from community members. This testimony centered on the human health issues perceived from being exposed to pile driving, the noise associated with pile driving, and suggestions for how the Noise Office should address pile driving.

After all of the information garnered by the industry professionals in the meetings, and the testimony from community members and other invested parties, in July 2015, the Noise Review Board made the decision to recommend a code change to Title 18 to limit pile driving construction to the hours from 8:00 am to 6:00 pm, Monday through Friday, and to increase notification to residents 30 days before the start of pile driving construction. This code change was passed by City Council.

## **Noise Task Force**

Noise Office staff also participated on a Noise Task Force convened by Commissioner Amanda Fritz in October of 2015 and concluded November 2015. This task force consisted of community members and industry leaders charged with the task of exploring potential solutions for

addressing pile driver noise. Additionally, the goal of the task force was to initiate discussions with the Noise Review Board and examine if additional noise concerns or solutions had not been addressed or suggested.

**Task Force members were:**

- Maryhelen Kincaid (Portland resident)
- Tina Penman (Portland resident)
- Jim Brunkhorst (Pacific Foundations)
- Doug Shapiro (Hoyt Street Properties)
- Ryan Pittel (Portland resident)
- Mary Sipe (Portland resident)
- Melissa Stewart (Noise Review Board member)
- Ryan Hyke (Pacific NW Regional District Council of Carpenters)
- Brad Nile (Andersen Construction)
- Paul van Orden (Noise Office staff)
- Katherine Couch (Noise Office staff)

The task force was unable to reach consensus after several meetings. Due to numerous challenges, the efforts of the task force came to a standstill, which placed the responsibility of pile driving noise concerns back to the Noise Review Board.

In March 2016, Commissioner Fritz sent a letter to interested parties announcing that she would not be recommending further code changes. The letter states in part:

*“The Task Force reviewed and provided initial feedback on the revised variance process proposal, which I then shared with the Noise Review Board at its February meeting. I heard from both the Task Force and the Noise Review Board, as well as from the pile driver union members and representatives who attended the March Noise Review meeting, an overarching concern that a variance process would not deter the use of impact pile driving equipment. Many parties advised that such a process would only serve the purpose of delaying an inevitable construction activity, which would be a strain on developers and the community. I also heard the Board’s concern about its perceived role in evaluating a geotechnical report.”*

**2017 Pile Driving on Block 20**

After receiving information that Hoyt Street Properties was going to use driven pile for their project at Block 20 in the Pearl District, Noise Office staff added this item to the September 2016 Noise Review Board. A brief synopsis of the meeting is listed below:

*Since the area is in very close proximity to the Chapman kindergarten overflow school site, the board shared their concern for the children attending the school. The Noise Control Officer looked at the space and called a representative from Portland Public Schools and learned that the outdoor activity time was for one hour. The acoustical engineer on the Noise Review Board felt that indoor activities would not be much of an issue, but the larger challenge would be the use of an outdoor space. It was shared that Hoyt Street Properties is talking to the contractor about possibly using a curtain system*

*to help mitigate noise. (Note: the cost was split three ways from DeWitt, Hoyt St. and Andersen)*

*A motion is made and passed to make a resolution to make a request to BDS for notification, and to clarify who should make a formal call from the permit side, as well as giving the board more information and to establish a communication system. Another motion is then made to take pile driving noise out of exemption status to come to the NRB for a variance to set mitigation conditions.*

### **Removing the Exemption for Pile Driving**

Currently, there are no noise mitigation methods for pile drivers that have been thoroughly tested to be considered practical in reducing noise. Removing an exemption would not alter the need to use driven pile under certain circumstances, as recommended by a geotechnical engineer and would only delay an essential phase of the construction process.

Additionally, the City is limited by *Oregon State Building Code. 2017 ORS 455.040*. This State building code specifically states that Oregon Code preempts local ordinances and rules:

“The state building code shall be applicable and uniform throughout this state and in all municipalities, and no municipality shall enact or enforce any ordinance, rule or regulation relating to the same matters encompassed by the state building code but which provides different requirements unless authorized by the Director of the Department of Consumer and Business Services.”

Further, *Section 1803 (geotechnical investigations)* states that:

“Building sites for new structures and facilities defined by ORS 455.447 as essential facilities, hazardous facilities, major structures [parking facilities are considered major structures when they are over three stories and 30,000 square feet of aggregate floor area] and special occupancy structures shall be evaluated on the site-specific basis for vulnerability to seismic geologic hazards. This evaluation shall be done by an especially qualified engineer or engineering geologist registered by the state to practice as such.”

Removing the exemption would require an approved variance from the Noise Review Board although, the recommendations by a geotechnical engineer are required to determine the most appropriate method of setting foundations. Without an accepted form of noise mitigation, the Noise Review Board would not be able to require mitigation approaches for the pile driver machinery if a variance were to be required on a project. Furthermore, Noise Office staff cannot envision a situation where the Noise Review Board would not follow the recommendations of a geotechnical engineer.

### **Practical Noise Mitigation Approaches for the Loudest Forms of Pile Driving**

No approach to mitigate the sound at the pile driver has yet been tested and found to be both effective and safe. In the past there have been attempts, but these attempts were limited to specific projects with mixed results.

For example, in Seattle over a decade ago, a contractor believed they developed a mitigation solution by using a crane holding a large metal shield to lessen the impact to a nearby apartment complex. The crane/shield was in very close proximity to the pile driver rigging. Although it was successful in helping limit the sound levels, the wind rendered it unsafe to workers and pedestrians, and unwieldy to control.

In Portland, in 2017, a project in the Pearl District used a sound shroud to dampen the noise from pile driving. It was partially successful but took three iterations with the first two falling apart and not having any effect. During one iteration, a large bolt dropped from the pile driver injuring a worker on the ground. The final iteration, which was used the last three days, included engineering improvements suggested by a local acoustical engineer who was also on the City of Portland's Noise Review Board.

The Noise Office conducted onsite screening and found an approximate six decibel (dBA Max) reduction with the shroud installed. A reduction of the sound by six decibels was promising. Unfortunately, much like the sound shield example in Seattle, the project in the Pearl District had improvements to the sound levels but safety issues were not resolved.

With more stringent testing of the shroud, this approach may end up being utilized at some point. **Currently, however, the Noise Office does not feel comfortable requiring this experimental type of mitigation.** Worker safety is paramount in an already dangerous profession, and it would be irresponsible to endanger the lives of those in the building trades.

Throughout the duration of examining pile driving, the Noise Office has received various handouts and unsourced information from members of the public attending Noise Review Board meetings and City Council sessions. While some of the noise mitigation information is encouraging, the information presented has not been used in the United States and is not standardized by the industry.

## **Conclusion**

The pile driving issue is one that has, for the last four years, been driven by the misrepresentation of information. The Noise Office estimates that staff has spent approximately 400 hours on this issue, holding meetings, taking minutes, site monitoring from the field, outreach to ensure we had a fair representation of professionals at board meetings, finding and capturing facts relating to deep foundation methods, substrate types, and how it affects Portland. The Noise Office staff has also spent many hours fact-checking information that has been presented to City Council and found a substantial amount to be insignificant or not accurate.

The Noise Office cannot justify the need to remove an exemption from using hammer-driven pile. Given the fact that the choice of setting deep foundations is driven by a geotechnical engineer, the noise team does not believe that removing an exemption would alter the need to use driven pile under certain conditions. Additionally, removing an exemption would create an extra step and requirement in the construction process, which contradicts the City of Portland's commitment to prioritizing and streamlining the permitting process.

The Noise Office found no current engineered solutions, acoustic damping accessories or safe noise mitigation applications that were tested and ready to be incorporated into City Code or into the process of noise variance reviews by staff and the Noise Review Board. **At this time, pile driving should not have any further limitations as a noise source in Title 18 Noise Code. Therefore, the Noise Office does not recommend removing any exemption on pile driving in Title 18 Noise Code.**



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