HARTCROWSER

A division of Haley & Aldrich

4 October 2021

Mr. Don Cole
City of Mercer Island – Community Planning & Development
9611 SE 36th Street
Mercer Island, WA 98040

**Re: Geotechnical Recommendations for Site Stabilization**
**Mercer Island Mixed Use Development**
**2885 78th Avenue SE**
**Mercer Island, Washington**
0202744-000 (19413-00)

Dear Mr. Cole:

In accordance with your request and the requirements of the City of Mercer Island (City) Work Stoppage, Excavation, and/or Site Restoration Bond, Hart Crowser, a division of Haley & Aldrich (Hart Crowser), is providing this letter outlining our geotechnical recommendations for the Mercer Island Mixed Use Development project in the event that the project is abandoned, and the retained excavation requires long-term stabilization.

Hart Crowser provided a final geotechnical report entitled "Multi-Family Development, Mercer Island, Washington" dated 3 November 2020 based on the 75 percent structural design plans dated 3 September 2020 and provided by PCS Structural Solutions.

David Winter, PE is the Geotechnical Engineer-of-Record for the project. However, the shoring system is designed by R. John Byrne, PE of Ground Support PLLC (Ground Support). The shoring plans (revised 20 August 2021) and calculations (revised 25 August 2021) were provided to Hart Crowser for review, and the shoring design has applied our geotechnical recommendations appropriately.

## Project Description

The project consists of a four-story, mixed-use building with one to two levels of below-grade parking located at 2885 78th Avenue SE in Mercer Island, Washington. The excavation will vary from about 8.5 feet below existing ground surface (bgs) on the west side to about 20 feet bgs on the north and east sides. Ground Support has designed a soldier pile and timber lagging system with a single row of tiebacks across all sides of the excavation.

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## Recommendations

If the site should be abandoned once it has been fully excavated and supported by the Ground Support's shoring design, then we recommend placement of a compacted soil berm against the shoring walls to the full height of the excavation. The berm should have a 5-foot bench at its crest with a slope no steeper than 2 horizontal to 1 vertical (2H:1V) to the base of the excavation. The backfill gradation is less critical than the ability to compact the fill into a stable condition that will support the lateral loads on the shoring if the shoring system fails or relaxes support over time. Because on-site soil will have been excavated, the imported material should be granular soil with less than 20 percent by weight passing the U.S. No. 200 mesh sieve (based on the minus 3/4-inch fraction) and have a maximum size of 4 inches. In wet subgrade areas, clean material with a gravel content of at least 30 to 35 percent may be necessary to provide a stable base for the placement of subsequent soil lift. Gravel is material coarser than a U.S. No. 4 sieve.

All fill should be placed and compacted in lifts with a loose thickness no greater than 10 inches. For hand-operated "jumping jack" or plate/sled compactors, loose lifts should not exceed 6 inches. Fill should be compacted to at least 90 percent of the modified Proctor maximum dry density (as determined by ASTM D1557 test procedure). To ease placement and compaction, the moisture content of the fill should be controlled to within approximately 2 percent of the optimum moisture. Optimum moisture is the moisture content corresponding to the maximum Proctor dry density. If restoration activities occur during the wet season, then compaction may be more difficult and, thus, the Contractor may choose to use a granular soil with about 5 percent or less fines (material passing the U.S. No. 400 mesh sieve).

Plastic sheeting should be used to cover the berms to prevent erosion. Periodic inspection and replacement of the protective cover may be necessary.

The site should have protective fencing constructed around the perimeter for security. Equipment, stockpile(s) or other heavy loads should not be placed within 20 feet of the edge of the excavation.

## Summary

The recommendations in this letter are based on the project information provided to Hart Crowser by Johnston Architects, PCS Structural, and Ground Support as of the date of this letter. If project conditions change, then Hart Crowser should be allowed to review the recommendations and revise if necessary.

This letter is for the exclusive use of XingHua Group for specific application to this project and site. We completed this work in accordance with generally accepted geotechnical engineering practices for the

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nature and conditions of the work completed in the same or similar locations, at the time the work was performed. We make no other warranty, express or implied.

We appreciate this opportunity to support the Mercer Island Mixed Use Development. Please let us know if we may provide any additional information or clarification of this letter.

Sincerely,

**HART CROWSER, A DIVISION OF HALEY & ALDRICH**


**DAVID G. WINTER, PE**
Geotechnical Engineer-of-Record
General Manager

**JOSEPHA (JODEE) TAYLOR, PE**
Project Manager
Geotechnical Engineer

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