EXHIBIT 2

an existing building will be located in close proximity to the shoring wall, the temporary shoring should be designed to limit deflections of the adjacent buildings to ½ inch or less.

Ground anchors should be designed to maintain an acceptable clearance from buried utilities in the right-of-way. The tiebacks will be required to be temporary because the ground anchors will extend into the City of Seattle right-of-way, and a street use permit will be required. The following section highlights specific considerations for each shoring wall.

- **Northwest Corner** – The northwest corner of the site (adjacent to 230 14th Avenue East and 224 14th Avenue East) is anticipated to be completed using temporary cut slopes to reach planned foundation elevation. The north end of the corner is anticipated to include grade changes of between 10 and 15 feet. The south end of the corner is anticipated to include grade changes of between 25 and 30 feet below site grades. We recommend that a horizontal offset of 5 feet be completed from adjacent building foundations prior to transitioning to temporary cut slopes.
- **Northeast Corner** – The northeast corner of the site (adjacent to 315 15th Avenue East) is anticipated to be completed using cantilever soldier piles/soldier piles with tiebacks. If plans or as-built information is not available for the adjacent building, potholing may be necessary to confirm the foundation elevations, conditions, and locations relative to the property line. A tour of the building may be sufficient to estimate the foundation elevation.
- **East, South, and West Walls** – We recommend that the east, south, and west shoring walls be completed using soil nail shoring with full depth vertical elements. Coordination with existing utilities will be required for ground anchors extending into the public right-of-way (15th Avenue East, East John Street, and 14th Avenue East).

We provide geotechnical design and construction recommendations for conventional soldier pile and tieback walls and soil nail shoring in the following sections. The City of Seattle will require that GeoEngineers review shoring design completed by others.

8.3.1. Excavation Considerations

Site soils may be excavated with conventional excavation equipment, such as trackhoes or dozers. It may be necessary to rip the glacially consolidated soils locally to facilitate excavation. The contractor should be prepared for occasional cobbles and boulders in the site soils. Likewise, surficial fill may contain foundation elements and/or utilities from previous site development, debris, rubble and/or cobbles and boulders. We recommend that project specifications identify procedures for measurement and payment of work associated with obstructions.

8.3.2. Soldier Pile and Tieback Walls

Soldier pile walls consist of steel beams that are concreted into drilled vertical holes located along the wall alignment, typically about 8 feet on center. After excavation to specified elevations, tiebacks are installed, if necessary. Once the tiebacks are installed, the pullout capacity of each tieback is tested, and the tieback is locked off to the soldier pile at or near the design tieback load. Tiebacks typically consist of steel strands that are installed into pre-drilled holes and then either tremie grouted or pressure grouted. Timber lagging is typically installed behind the flanges of the steel beams to retain the soil located between the soldier piles. Geotechnical design recommendations for each of these components of the soldier pile and tieback wall system are presented in the following sections.