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Attention: Ryan Doody

Subject: Summary Letter_Rev1
Geotechnical Construction Phase Services
4732 Brooklyn Avenue NE
Seattle, Washington
File No. 21887-003-00
SDCI No. 6706198-CN

INTRODUCTION

This letter presents a summary of GeoEngineers' construction observation services for the University District Safeway Development Project located in Seattle, Washington. Our services for this project were completed in general accordance with our Master Services Agreement dated January 25, 2021.

The project involved the development of a seven story mixed-use building with two levels of below-grade parking. The project site is bounded by NE 50th Street to the north, an alley to the east, adjacent property (4700 Brooklyn Avenue NE) to the south and Brooklyn Avenue NE to the west.

The excavation for the building extended up to approximately 30 feet below site grades. The north, south and west walls of the excavation were completed using temporary soldier pile and tieback shoring and the east wall completed using hybrid soldier pile/soil nail/tieback shoring.

OBSERVATIONS

GeoEngineers visited the site on an intermittent basis on 44 occasions between December 29, 2020 through November 17, 2021, to monitor adjacent building settlement, excavation, shoring installation and performance monitoring, tieback anchor installation and testing, soil nail installation and testing, soldier pile installation, observe temporary erosion control, and attend two pre-construction meetings. This summary letter focuses on the inspection items detailed for permit number 6706198-CN. Detailed reports of our construction observation services are presented in our daily field reports for the project, Numbers 1 through 44 (dated December 29, 2020 through November 17, 2021). Copies of these field



reports were provided to the City of Seattle Department of Construction and Inspection (SDCI), the Seattle Department of Transportation (SDOT), CA Ventures, Malcolm Drilling, and others during construction.

Adjacent Building Settlement

Monitoring points were established on the shoring walls and adjacent buildings to monitor deflections during shoring construction. GeoEngineers reviewed the survey data as it was received. Shoring wall and adjacent building settlements were determined to be within the tolerable bounds (less than 1 inch).

Shoring Installation and Performance Monitoring

We observed the installation of a hybrid soil nail and tieback shoring system on the east side of the excavation as well as a soldier pile tieback shoring system along the north, south, west and east sides of the excavation. The shoring was installed from March 9 to April 23, 2021. The shoring walls were surveyed two times a week. GeoEngineers reviewed the survey data as it was received.

Based on our observations, it is our opinion that the shoring was installed in general accordance with the project plans and specifications and performed adequately. Shoring wall deflections were within tolerable bounds (less than 1 inch).

Tieback Anchor Installation, Testing and Destressing

Approximately 124 tieback anchors were installed for the project between March 9 and April 14, 2021. Installation of tiebacks consisted of drilling a 5½-inch-diameter hole to the required depth, inserting cable strands in the hole and then grouting the hole full depth with structural grout. The tiebacks were prefabricated with bond breakers over the unbonded length consisting of a grease-filled polyethylene sheathing. The majority of the production tiebacks were installed at a declination of 25 to 40 degrees.

There were a total of six verification tiebacks. The verification test consisted of loading the tiebacks to 150 percent of the design load and holding the load for 60 minutes, then loading the tiebacks to 200 percent of the design load and holding the load for 10 minutes.

Proof tests were completed prior to locking of each tieback at its design load to confirm that the production nails met the specified pullout resistance. The proof test consisted of loading the tiebacks to 133 percent of the design load and holding the maximum load for 10 minutes.

The tiebacks along the north, east and west walls were destressed. Destressing of tiebacks consisted of torching the tieback strands and wedges. The tiebacks along the south wall was left stressed per the property easement with the south property owner.

Based on our observations, it is our opinion that the tieback anchor installation, testing and destressing was completed in general accordance with the project plans and specifications and the designer's recommendations.

Soil Nail Installation and Testing

Approximately 139 soil nails were installed for the project between March 12 and April 23, 2021. Installation of soil nails consisted of drilling a 6-inch-diameter hole to the required depth, inserting a



threaded steel bar in the hole and then grouting the hole full depth with structural grout. The majority of the production soil nails were installed at a declination of 15 degrees.

There were a total of two verification soil nails. The verification test consisted of loading the soil nail to 150 percent of the design load and holding the load for 60 minutes, then loading the nails to 200 percent of the design load and holding the load for 10 minutes.

Five proof tests were completed during installation of the production soil nails to confirm that the production nails met the specified pullout resistance. The proof test consisted of loading the soil nails to 150 percent of the design load and holding the maximum load for 10 minutes.

Based on our observations, it is our opinion that the soil nail installation and testing was completed in general accordance with the project plans and specifications and the designers' recommendations.

Soldier Pile Installation

Soldier piles were installed for the project between February 16 and March 5, 2021. Installation of soldier piles consisted of drilling a 30-inch-diameter shaft to the required depth, inserting the soldier pile while checking for elevation and plumbness, and then filling the shaft with lean mix concrete.

Based on our observations, it is our opinion that the soldier pile installation described above was completed in general accordance with the project plans and specifications and the designers' recommendations.

Dewatering

We observed the installation of a temporary vacuum wellpoint dewatering system during our site visits from March 16 to April 13, 2021. Dewatering discharge volumes were documented by other members of the team. Groundwater levels were monitored prior, during and after temporary dewatering using several monitoring wells in the vicinity. Temporary dewatering continued throughout construction up to a point where the permanent structure could resist the hydrostatic buoyancy pressures at which point temporary dewatering was not required.

Based on our observations, it is our opinion that the temporary dewatering was constructed and maintained to effectively construct the below grade portion of the building and temporary shoring.

Excavation and Slope Stability

Excavation of soil and stability of slopes/vertical cuts in front of the shoring walls were observed throughout construction.

The cut slopes and excavations at the site remained stable and were completed in general accordance with the project plans and our recommendations.

Temporary Erosion Control

Temporary erosion control was monitored during each site visit by GeoEngineers. The contractor implemented temporary erosion control measures as necessary to keep dirty water and soils from leaving the site. Based on our observations, it is our opinion that the erosion control measures were in general accordance with the project plans and specifications.

CONCLUSIONS

Based on observations and evaluations completed for the project, we conclude that the work discussed herein for the 4732 Brooklyn Avenue NE Project has been completed in accordance with the intent of our recommendations and the City of Seattle approved project plans and specifications.

We trust this letter meets your current needs. Please call if you have any question regarding this letter.

Respectfully submitted,
GeoEngineers, Inc.



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