

EXCAVATION SHORING MONITORING

Pier West - Bosa Development

A CUSTOMER SUCCESS STORY

BY RST INSTRUMENTS LTD.



Buildings and rail tracks adjacent to the waterfront development area.

BACKGROUND

Pier West by Bosa Development is a prominent high-rise and waterfront development in New Westminster, B.C. The two 53-storey, residential buildings will be the final piece of the waterfront's revitalization when completed. Set in an 11-acre property, Pier West is fronted by the Fraser River and is bordered in the north of the property by a busy rail line utilized by the Canadian National Rail, the Canadian Pacific Rail and the Southern Railway of British Columbia.

OBJECTIVE

GeoPacific proposed an instrumentation plan developed to monitor the site during the excavation and shoring of this development in order to ensure construction did not adversely affect surrounding rail tracks and buildings.

CHALLENGES

Work on Pier West occurred on a busy and densely developed location at the waterfront of New Westminster. The site is bordered by the Fraser River and a vital rail corridor. Monitoring the impact of excavation on the infrastructure around the site was important.

SOLUTION

Digital in-place inclinometer systems (IPI's) were used to monitor inclination at key locations in the shoring walls. This helped to manage risk, confirm design assumptions, and to mitigate possible impacts to adjacent structures such as the Fraser Discovery Centre. In addition, the data collected before, during and after construction provides the client with documentation in case conflict arises with other stakeholders. The data can be used to as evidence that damage was not caused by the owner.

KEY FACTS

LOCATION

New Westminster, BC Canada

PROJECT PARTNERS

Owner: BOSA Development
Geotechnical Consultant:
GeoPacific Consultants Ltd.

PROJECT DETAILS

GeoPacific provided geotechnical engineering services to Bosa Construction on this project. In conjunction with GeoPacific's design and construction oversight, their staff carried out the instrumentation and monitoring plan. The instrumentation plan included a robotic total station, vibrating wire load cells, and in-place inclinometer systems. RST Instruments supplied vibrating wire load cells and in-place inclinometers to monitor various shoring elements, including secant pile and cutter soil mixing (CSM) walls. IPI's were installed at soldier pile locations along the shoring wall. Load cells were used at the same locations as the IPI to monitor tie-back anchor loading in real time.

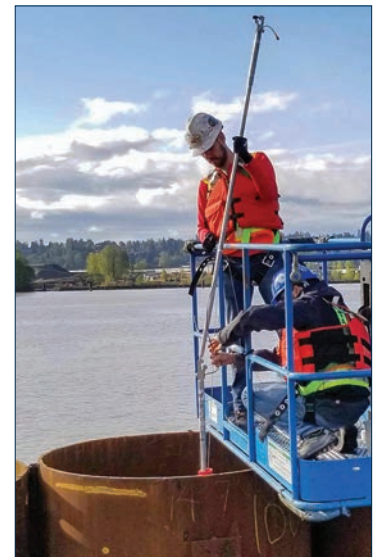
SCOPE/OBJECTIVE

In order to ensure the construction activity did not adversely affect surrounding rail tracks and buildings, an instrumentation plan was developed to monitor the site during the construction of this development. The project is made up of two high rise buildings with an over 11-acre park on New Westminster's boardwalk.



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Digital Bus In-Place Inclinometers being lowered into Inclinometer Casing inside of a pile.

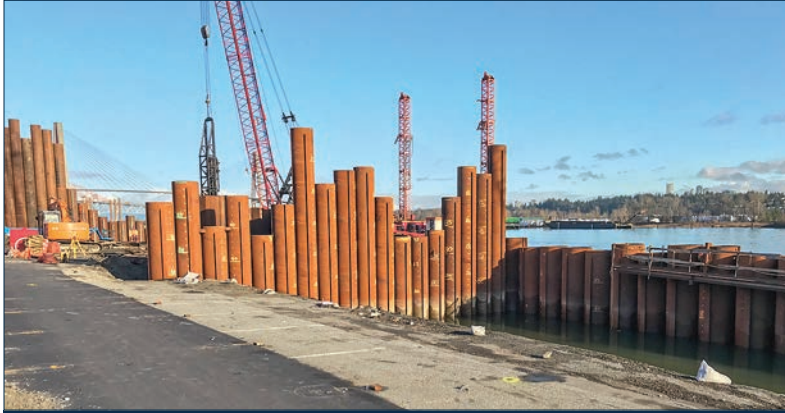
TURN
OVER

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Secant pile wall along the shoreline at the construction site.



Three rail tracks run alongside the construction site.

ADDITIONAL INFO

CHALLENGES

Large project in a densely developed location. The site is between the Fraser River and a major rail corridor. Monitoring the impact of the infrastructure around the site was important. Access next to the Fraser River was difficult. A boom lift had to be used over the water for installing instruments due to access challenges.

SOLUTION

The customer determined that IPIs and VWA load cells would meet their monitoring requirements. Twelve IPI strings were installed into 70 mm Snap Seal inclinometer casing, along with eight vibrating wire load cells. Each Inclinometer location is approximately 40'-50' in depth. The data from the instruments was collected with data loggers in real time and made available to the project team on a privately accessible website.

BENEFITS

RST Instruments provided IPI's that are accurate, reliable and familiar to GeoPacific.

RESULTS

This project is on-going, but monitoring determined that no issues with movement on the project to date. The data is valued by the stakeholders and will be used in the event of conflict with other parties if necessary. The data is also useful for design validation.

INSTRUMENTATION

RST Instruments IPI's and vibrating wire load cells, a third-party robotic total station, and Worldsensing data loggers.

COMPLETION DATE

2020 (estimated)



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