



Key achievements

- One of the largest global jet grouting projects performed.
- Cellular Improved Soil Mass (ISM) designed to laterally support the waterfront in event of the design earthquake.
- Deteriorating timber/steel/concrete structure replaced by ISM.

The project

To improve seismic safety, resiliency, and overall redevelopment of the downtown waterfront, 0.75 mile of existing seawall was replaced. Built between 1916-1935, the original wall included steel sheets and tens of thousands of timber piles overlain by a timber relieving platform, 13 feet below the Alaskan Way street grade. The replacement was due to the degradation of the structure, compounded by the susceptibility of underlying soils to liquefaction (emphasized by the 2001 6.8 magnitude Nisqually earthquake).

The challenges

Installation of the ISM required avoidance of the vertical and battered piles located below the relieving platform, as well as avoidance and/or protection of the numerous known and unknown underground utilities. Access to waterfront businesses and safe passage of tourists, pedestrians, and vehicles had to be maintained.

The solution

5,750 jet grout columns of 3 to 6 foot diameter were installed to competent soils to depths of 40 to 90 feet. Columns were installed in a continuous, interlocking cellular pattern.

“Work was safely and well done while minimizing disruptions to the public on our busy waterfront.”

Jody Robinson, PE – Resident Engineer

Application

Liquefaction Mitigation & Bulkhead Rehabilitation

Technique

Jet Grouting

Market

Roadway/Highway & Seawall

Client

City of Seattle
Department of Transportation

Main contractor

Mortenson / Manson,
A Joint Venture

Keller business unit (s)

Hayward Baker