

Yuxin (Wolfe) Lang, PE, GE, PEng

Principal Engineer



Education

- MS, Civil Engineering, University of Waterloo, Ontario, 2002
- BS, Geological Engineering, Hebei Institute of Civil Engineering, China, 1993

Registrations/Certifications

- Professional Civil Engineer (Geotechnical): OR, #78866, 2007
- Professional Civil Engineer: WA, #44381, 2008; Ontario, Canada, #100049788, 2004; British Columbia, Canada, #32134, 2008
- Geotechnical Engineer: OR, #78866, 2009

Expertise

- Foundations
- Ground improvement systems
- Soil retaining structures.
- Shoring design
- Groundwater control
- Slope stabilization
- Landslide remediation
- Soil improvement
- Construction consultation

Wolfe Lang has more than 29 years of geotechnical engineering experience, and his focus is on water, wastewater, and conveyance projects. He has a strong background in analyzing and designing various foundations, ground improvement systems, and soil retaining structures. He has expertise in seismic ground motion characterization analysis, liquefaction analyses, post-liquefaction settlement analyses, post-liquefaction soil residual-strength evaluations, and seismic soil-structure design. His water, wastewater, and conveyance projects include new treatment facilities and reservoirs, seismic rehab of existing facilities, deep pump stations, pipelines, and trenchless crossings. Wolfe has provided senior geotechnical review for field exploration, subsurface condition interpretation, seismic hazards evaluation, dewatering, and pipe/trench construction considerations.

Relevant Experience

Bull Run Filtration Pipelines Project, City of Portland Water Bureau, Multnomah, and Clackamas Counties, OR (2020-Present)

Wolfe is the geotechnical and seismic design lead for the Raw Water Pipeline of this project. The project includes designing two large diameter (72-inch conduit) pipelines with a deep tunnel section and shaft, connecting interties, and associated appurtenances and structures that will supply water to the Bull Run Filtration Facility. Extensive geotechnical explorations and instrumentations were conducted to assess the subsurface conditions. Geotechnical evaluations include seismic liquefaction potential along the alignment, ground deformation analysis for the tunnel portal, site response and amplification analysis, excavation support system evaluation for the deep shaft, tunnel alignment evaluation, groundwater control and rock excavation recommendations, preparation of geotechnical reports, and preparation of plans and specifications.

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WWSP Water Treatment Plant (WTP_1.0), Sherwood, OR (2018-Present)

Wolfe is the geotechnical engineering lead for the new water treatment plant located near the City of Sherwood. The site challenges include difficulty deep rock excavation, difficult site access, environment restrains, and seismic hazards. The investigation and evaluation included field exploration of 12 soil/rock borings, 15 air-track drilled probes, four test pits and three seismic refraction survey. Geotechnical engineering evaluations include seismic hazard analysis for local faults/CSZ earthquakes, seismic ground motion analysis, structural foundations, retaining walls,

dewatering and deep excavation rock blasting evaluation.

Geren Island Water Treatment Plant and Ranney Collector Intake, Salem, OR (2018 to 2023)

Wolfe was the lead geotechnical engineer for the new ozone treatment facility and a 10 MGD collector well intake (Ranney Intake). The Ranney Intake consists a 20-foot-inside-diameter by 30-foot deep reinforced concrete shaft with seven lateral screens extending out from the shaft to collect groundwater. Delve Underground conducted a thorough geotechnical evaluation for these project elements, conducted seismic hazard evaluation, conducted the structural design for the intake shaft (using caisson method) and the mechanical and electrical design for the intake. The caisson was successfully constructed in 2020.

Portland Water Bureau Willamette River Crossing, Portland, OR, (2013–2023)

Wolfe was the lead geotechnical engineer for both the feasibility study and the on-going design-build owners engineering service of a new 4,000 ft long, 42-inch steel water line crossing of the Willamette River using HDD for the Portland Water Bureau. The main geotechnical challenges include soil liquefaction and lateral spreading on the riverbanks and soft alluvium at the bottom; open-graded flood gravel with boulders; competent but deep Troutdale Formation; and potential conflicts with existing bridge foundations and other deep tunnels in the project area. Wolfe managed the geotechnical exploration program during the preliminary design phase, developed soil liquefaction and ground deformation models, and conducted soil-pipe interaction models to verify the seismic resilience goal. Additionally, a geotechnical baseline report was developed identifying and baselining underground conditions as an essential part of risk mitigation approaches.

Lake Oswego-Tigard Water Partnership, WTP Expansion, West Linn, OR (2011-2014)

Wolfe led geotechnical engineering for the Lake Oswego-Tigard Water Treatment Plant. The geotechnical challenges include seismic liquefaction, deep excavation, and shoring while maintaining existing plant operational. The geotechnical investigation included borings, CPT tests, and in situ seismic shear wave testing. Based on these exploration and engineering evaluation results, we recommended using Auger-Cast Piles as the foundation support and liquefaction mitigation system

Groundwater Development Package #2B, Gresham, OR (2022–2023)

Wolfe led the geotechnical, seismic and trenchless evaluation for the design of 24-inch and 36-inch diameter, 12,000-foot long, ductile iron water main project. Delve Underground conducted extensive research on the geotechnical information along the alignment alternatives, conducted field explorations at some key locations (trenchless crossing and high seismic hazard zones), assessed the seismic hazards and potential ground deformations along the alignment alternatives, evaluated seismic resiliency for the ductile iron pipe, assisted the preferred alignment selection, and developed design and cost estimates for the trenchless crossing at Trimet light rail and Burnside Street.

Grants Pass New Water Treatment Plant and Intake Improvement, City of Grants Pass, OR (2021 to Present)

Geotechnical and Seismic Resiliency Lead

Wolfe was the lead geotechnical engineer for the design of the new water treatment plant, raw water pipeline and the seismic improvement of the existing intake/pump station structure. Delve Underground conducted a thorough geotechnical evaluation for these project elements, conducted seismic hazard evaluation for the water treatment plant and mitigation evaluations for the existing intake structure. For the raw water pipeline, we evaluated the trenchless installation alternative under the busy intersection and state highway. We also evaluated the intake screen and cleaning system improvement alternatives.

Taylor Water Treatment Intake Improvement Evaluation, City of Corvallis, OR (2020)

Geotechnical and Seismic Resiliency Lead

Wolfe led the geotechnical and seismic evaluation for the improvement study of the intake at Taylor Water treatment plant at Willamette River in Corvallis. Delve Underground evaluated the subsurface conditions, conducted preliminary river geomorphology assessment, evaluated the seismic hazards (liquefaction potential and lateral spreading) of the river bank and the feasibility of trenchless installation of the intake pipe. We developed concepts, alternatives and planning-level cost estimates for the new intakes. We also evaluated the seismic vulnerability of the existing intake and developed mitigation approaches and cost estimates to stabilize the existing intake and pipeline in the CSZ 9.0 earthquake event.