



COLORADO SCHOOL OF MINES

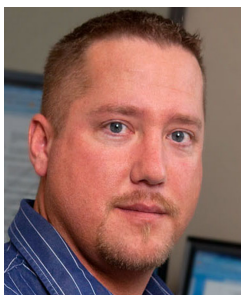
# underground

## LUNCH & LEARN

### THE BALLARD SIPHON PROJECT MEETS THE HERRENKNECHT VERTICAL SHAFT MACHINE

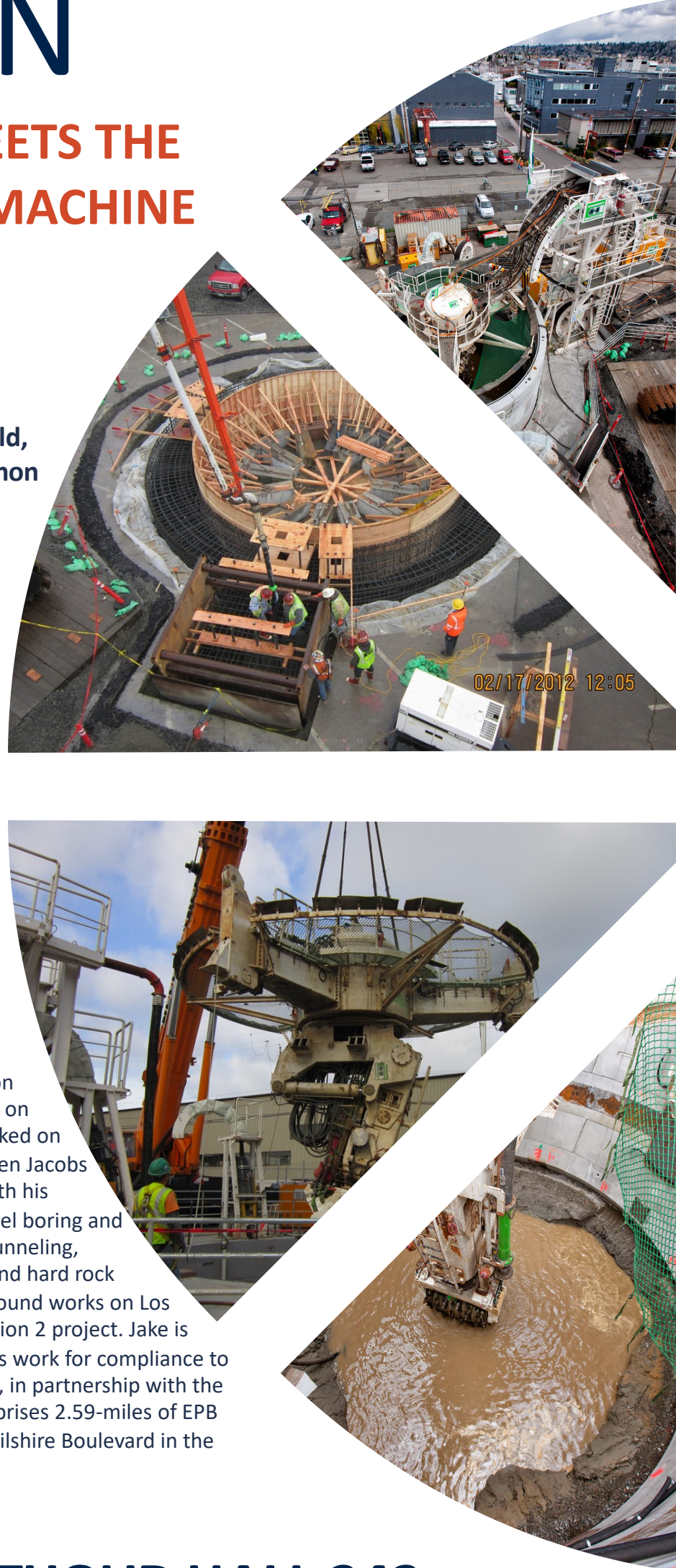
March 4th, 12-1PM  
BERTHOUD HALL 243

King County Washington's Ballard Siphon Replacement Project rehabilitated and expanded the capacity of existing twin 70-year old, 36-inch-ID wood stave pipes that convey raw sewage beneath Salmon Bay to the West Point Wastewater Treatment Plant. The project consisted of one secant pile shaft, and one shaft constructed utilizing a Herrenknecht Vertical Shaft Machine (which was the first use of the VSM technology in North America). Each shaft was approximately 30 feet in diameter and up to 120 feet deep; a 1,977-foot-long EPB tunnel beneath Salmon Bay, finished with an 85.5-inch-ID pipeline; slip lining of the existing wood stave pipes with 30-inch OD HDPE pipes; and ancillary concrete structures with associated excavations at either end of the tunnel to connect it to the existing wastewater system. Focusing on the use of the Herrenknecht Vertical Shaft Machine (VSM), you will get a better understanding for the reason this technology was used, the advantages/disadvantages, as well as lessons learned during this challenging project.



**Jake Taylor** is a Field/Project Engineer & Construction Manager for McMillen Jacobs Associates. He graduated from Colorado School of Mines with a Bachelor of Science degree in Mining Engineering and has more than 19 years of civil and construction experience as a field/project engineer & Construction Manager on tunnels and other heavy civil construction projects. Having worked on several projects on the contractor's side prior to joining McMillen Jacobs Associates, Jake combines practical construction experience with his

knowledge of engineering design. He is also experienced with several types of tunnel boring and trenchless construction techniques, including slurry and EPB tunneling, hard rock tunneling, horizontal directional drilling, micro tunneling, pipe jacking as well as soft ground and hard rock shaft sinking techniques. Currently, he serves as Construction Manager for underground works on Los Angeles County Metropolitan Transportation Authority's Purple Line Extension Section 2 project. Jake is responsible for providing oversight of CM staff as well as monitoring the contractors work for compliance to schedule, budget, technical specifications and legal requirements. McMillen Jacobs, in partnership with the Purple Line 2 CM JV, is the lead tunneling subconsultant on the Project, which comprises 2.59-miles of EPB twin bored tunnels and cross passages, double track heavy rail transit line below Wilshire Boulevard in the cities of Los Angeles and Beverly Hills, including two new underground stations.



**Mar. 4th, 12-1 PM – BERTHOUD HALL 243**

**LUNCH WILL BE PROVIDED**

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