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HDD DESIGN and CONSTRUCTION CHALLENGES OF BLAIR WATERWAY UTILITY RELOCATION

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ABSTRACT:

This paper presents design and construction challenges for four parallel HDD crossings beneath the Blair Waterway shipping channel at the Port of Tacoma. The Port's plan to widen and deepen the shipping channel required that utilities that crossed beneath and over the waterway be relocated outside the future channel limits. Horizontal directional drilling (HDD) methods were selected to install new utilities beneath the waterway in four parallel 2,200 foot long crossings. The crossings consisted of fiber optic and copper communication lines; a water line, 15 kV distribution lines; and a 115 kV transmission line. HDD profile constraints included, major unmapped underground utilities, timber piles from a former Bridge and fender wall foundation, pile foundations for steel power line towers, and wood piles from abandoned port structures. A key HDD design consideration for the 115 kV transmission line was thermal evaluations to insure the power lines could operate at the desired amperes.

A fast tracked design effort and proactive coordination with utility owners was required so that these utility owners had enough time to install new utility lines prior to commencement of the widening work. In addition, vehicle and rail access to Port facilities had to be maintained at all times due to ongoing terminal operations and a major terminal expansion project being constructed around the HDD staging areas. HDD offered the best solution to addressing construction impact, cost, and schedule constraints. The four crossings were completed in approximately 3 months.