Memo

To	**Douglas Wright**	Project No.	**2-91M-14312**
	Tetra Tech / KCM		
From	**Jim Dransfield**	cc	
Date	**January 17, 2002**		

Subject   Taylor Road Bridge

Doug – we have evaluated the vertical and lateral capacity of driven steel H-piles for the replacement bridge at Taylor Road in Kitsap County. We understand a three-railcar wide bridge is to be installed to span the gap where a culvert crossing washed out last month.

We have reviewed the boring logs (by others) for the Chico Creek Bridge on Northlake Way, located about ¼ mile east of the subject site. Those boring logs indicate subsurface conditions consisting of about 10 feet of loose to dense gravelly sand fill underlain by very dense gravelly sand fill, with occasional interbeds of silts and sands of similar density. Due to the emergency nature of this project, no additional borings were made at the replacement bridge location.

We understand driven H-piles, either 10-inch or 12-inch, are planned for the replacement bridge. These piles would be installed on either side of the creek. The topographic map you provided to us indicates the maximum slope on the bank of the creek is on the order of 2.5H:1V or flatter. Topographic relief between the upland and the creek bottom is on the order of 10 feet.

We understand a pile bent is to be constructed at each side of the creek, each including five to six driven piles. We understand the working capacity of each pile is to be on the order of 25 tons.

We have checked the vertical capacity of driven piles. We find that for embedment by at least 15 feet (5 feet below the base of the creek), the 10-inch square H-pile will have at least 50 tons of allowable capacity. Greater capacity would be feasible with greater embedment. Larger diameter piles would also provide higher capacity.

Because no confirmatory borings have been made, to provide assurance that sufficient embedment is achieved, we recommend installing piles to at least 20 feet below grade. The apparent working capacity of each pile should be confirmed in the field using the Engineering News Record formula, for the hammer selected by the Contractor.

For lateral capacity, these piles will be relatively short, and will tend to rotate about the base as a pole rather than behave as a long pile in bending. We recommend calculating lateral capacity by assuming a passive pressure (expressed as an equivalent fluid unit weight) acting over two pile diameters by eight pile diameters in depth. Because the upper about 10 feet of the pile within fill soils, with a foreslope of about 2.5H:1V, a passive pressure of 200 pcf should be assumed. Lateral deflection due to the pile acting against the soil would be about 1 to 2 percent of the 8-pile diameter length. If the upper portion of the pile is assumed to be unsupported, the portion of the pile below the base of the creek may be assumed to provide a passive resistance of 550 pcf.