A CLOSER LOOK: MINIMIZING NORTH DELTA PILE DRIVING

Piles are a common construction material for major infrastructure. Driving piles into place through traditional impact driving can create considerable noise. The Delta Conveyance Design and Construction Authority (DCA), working at the direction of the Department of Water Resources (DWR), will limit impact pile driving by relying primarily on other installation technologies or construction methods.

Driving Methods

Impact pile driving involves an apparatus with a ram or hammer that moves up and down and rapidly strikes a pile, driving it deeper into the ground with each strike. While the Delta Conveyance Project would utilize impact pile driving where necessary, the Project would emphasize two other driving methods that create far less noise:

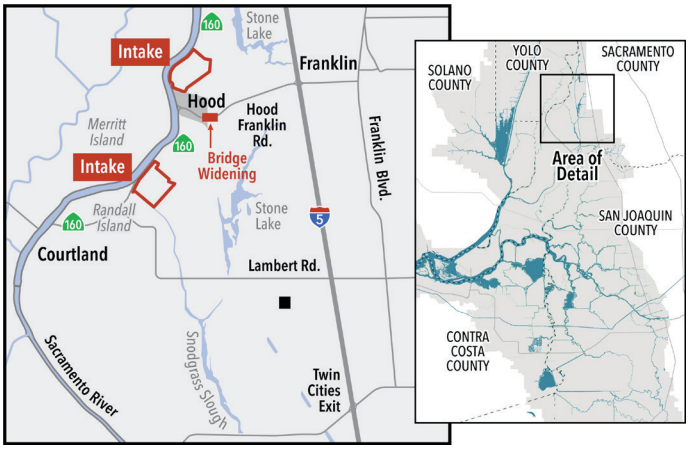
Vibratory Driving: Where soil types and densities permit, machines that use a vibratory form of hammer will drive down piles, which are designed to work with subsurface materials to bear the load of a structure.

Drilling: A rotating auger in some instances is suitable for loosening or removing soil to install piles or piers that are designed to bear the load of the new structure.

Driving steel sheet piles with an impact hammer

Three Pile Driving Locations

Pile driving is necessary to widen the bridge on Hood-Franklin Road bordering the Stone Lakes National Wildlife Refuge. Pile and pier installation is also necessary to construct the two intakes to be located north and south of the community of Hood. Construction is planned for weekday, daytime hours.



First Step: A Pilot Study

Prior to intake construction, field investigations would be conducted at an intake site involving temporary installation and testing of piles. Noise will be measured and monitored. The effectiveness of the different pile driving methods will be examined as well. This initial on-site experience will lead to actual construction practices that will lessen the noise as much as possible.

The Intakes: Limiting Cofferdam Impact Pile Driving

Intake construction begins with sealing off and later dewatering the immediate riverbank work area using a temporary cofferdam of approximately 1,000 feet in length. The cofferdam is secured into the river floor using a network of sheet piles typically measuring about 2.3 feet wide by about 1-inch thick and about 100 feet long. If vibration does not fully drive the sheet piles into place, approximately two minutes of impact driving would be required to complete the installation of each pile. The maximum amount of impact pile driving would total up to 18 hours at each location over a period of roughly five weeks. Impact pile driving would be staggered by one year at each respective intake location to avoid key migratory periods for important fish species, such as salmon.

Installing a drilled pier casing with a vibratory hammer

Intake Structures: Drilled Foundation Piers and Log Boom Piles

Foundation piers for the intake structures and flow control structures at each intake would be installed as drilled piers using augured excavations. The piers would be constructed of reinforced concrete measuring 42-inches in diameter by about 85 feet long and placed using steel starter casings that would be driven into place by vibration. No impact pile driving would be needed for the starter casings. Approximately 1,200 piers would be installed at each intake location over a period of about 18 months. During the last summer construction season at each intake, vibratory and impact driving would secure 32 piles measuring about 110 feet to help construct log booms to protect the intakes. Impact driving would take place for five-plus hours at the intake north of Hood and about an hour south of Hood over three to four work days in total.

Auger drilling a pier inside a steel casing

Hood-Franklin Bridge Widening: About A Week of Pile Driving

In order to transport construction workers via electric buses to the intake construction sites and to construct a new dedicated haul road, the existing Hood-Franklin Road bridge bordering the Stone Lakes National Wildlife Refuge would be widened for 180 feet. An estimated 46 piles measuring 16 inches by 50 feet need to be driven by the impact method to support bridge abutments, taking seven to eight construction days as the road remains open.