



Kitty Hawk Offshore Wind Project

Project Construction

Installation of Foundations

- Delivery of foundation (monopile, piled jacket, or suction caisson jacket) to the site by vessel.
- *Monopiles*: installed using a hydraulic impact hammer and/or drilling techniques.
- *Piled Jacket*: support piles are installed using same methods as monopiles. Once the piles are in place, the jacket structure is secured to the piles.
- *Suction Caisson Jacket*: suction caissons are fitted with pumps and control units and then the jacket structure is lowered onto the seabed. The water contained within the caisson is pumped out, creating a suction force. This negative pressure causes the caisson to bury itself securely into the seabed.

Installation of Wind Turbine Generators

- Turbines will be transported to the site, either pre-assembled or in sections.
- If pre-assembled, a heavy-lift vessel will lift the turbine onto the foundation and secure it in place.
- If transported in sections, the tower will be secured first to the foundation, then the nacelle will be placed on top of the tower and secured, then each blade will be attached to the nacelle.
- Once installation is complete, the turbine will be connected to the inter-array cables and follow a process of testing and commissioning prior to becoming operational.

Cable Laying

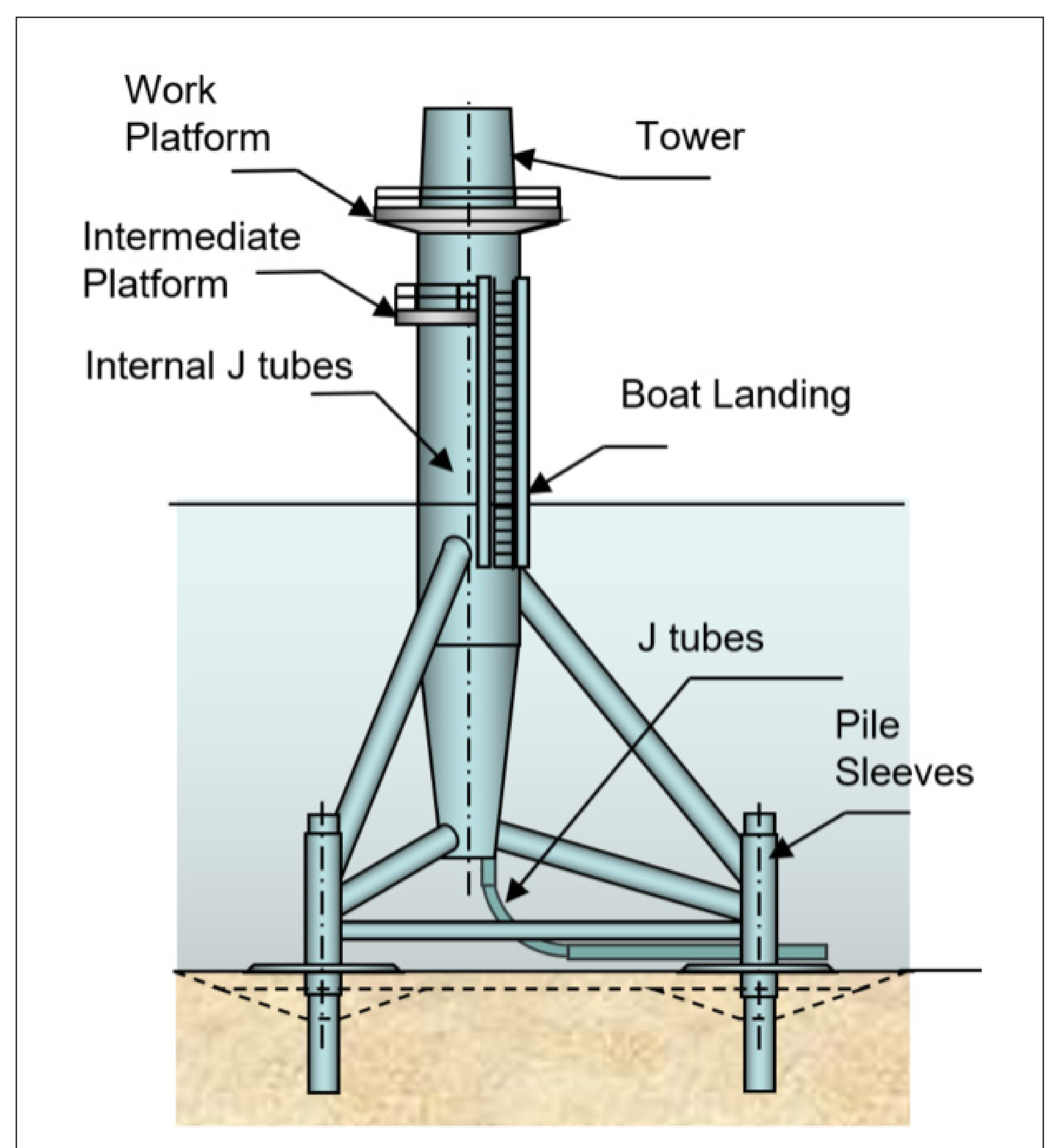
- The target burial depth is 5 to 8 feet (1.5 to 2.5 meters) beneath the seabed.
- Cables installed using a jet to discharge pressurized seawater to create a trench, a tool towed behind the installation vessel to simultaneously open the seabed and lay the cable, or by laying the cable and following with a tool to imbed the cable.
- Installation methods for these options include jet plowing or trenching, mechanical plowing, and free-lay and post-lay burial.
- Cable protection options under consideration include rock armor, gabion rock bags, concrete mattresses, and protective half-shells.



Installation Vessel Pacific Orca loaded with monopiles and transition pieces



Offshore transportation of monobucket on jack-up vessel



Piled Tripod Concept

