

Device name: PALM (Pull and Lock Marine) Quick Connect System

Device description and details:

The PALM mooring connector is based around a submerged buoy mooring with an integrated electrical riser. Tugs are used to position the Wave Energy Converter (WEC), engage the PALM, and complete the mechanical and electrical connections. The connector provides robust, reliable, and repeatable connections of the WEC in a short, simple marine operation.

A prototype scale of the PALM is to be tested, the device comes in two parts: the receptacle and the plug. Technical details as follows:

Overall length: 3330mm

Overall maximum diameter: 464mm

Overall weight (in air/water): 1197kg/1027kg

Plug length: 3245mm

Plug maximum diameter: 464mm

Plug weight (in air/water): 321kg/265kg

Receptacle length: 2805mm

Receptacle maximum diameter: 750mm

Receptacle weight (in air/water): 876kg/762kg

During testing the PALM will be attached to a steel test frame. Technical details of the frame are as follows:

Maximum height: 2300mm

Maximum width: 1767mm

Maximum length: 6530mm

Weight: 1620kg

The frame will be attached to the top plate of a buoy, which will be moored in place. Technical details of the buoy are as follows:

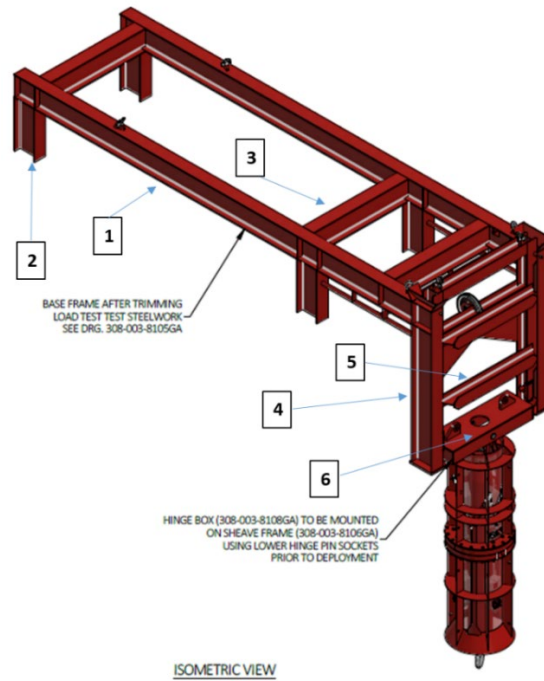
Height: 2000mm

Diameter: 5500mm

Weight: 10900kg

Images:

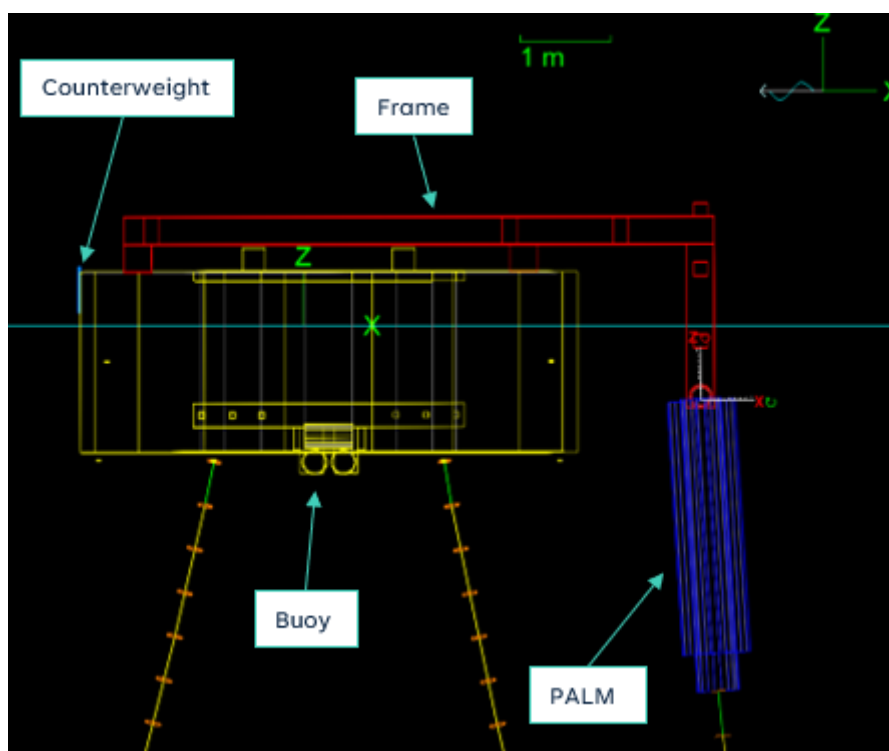
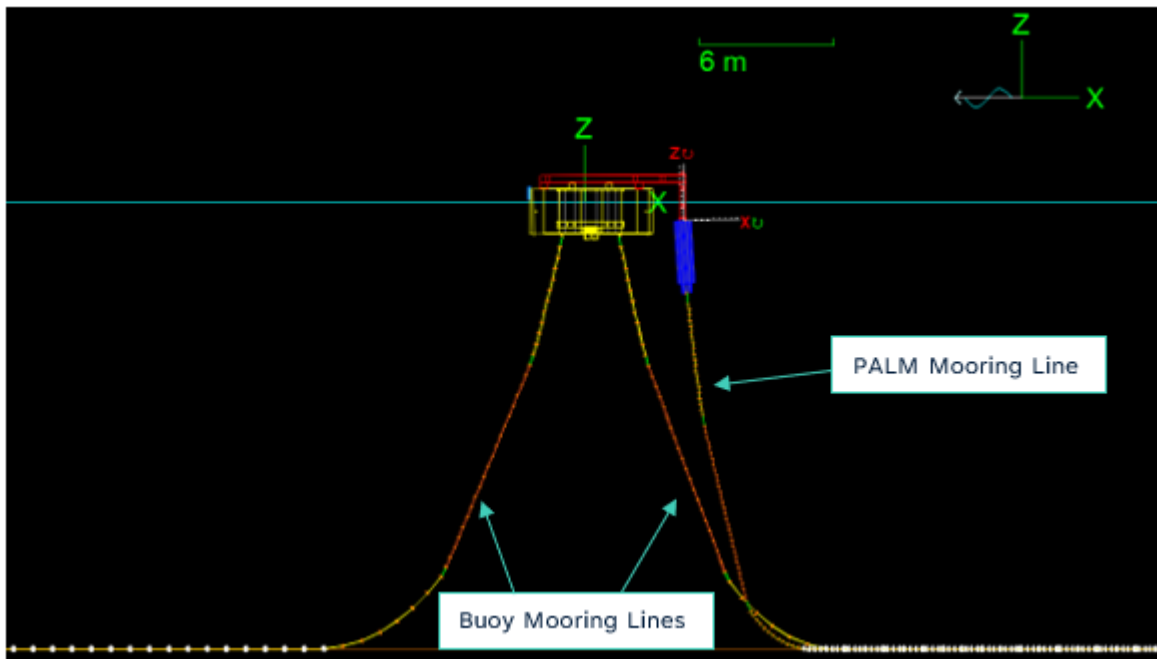
Test frame and PALM:

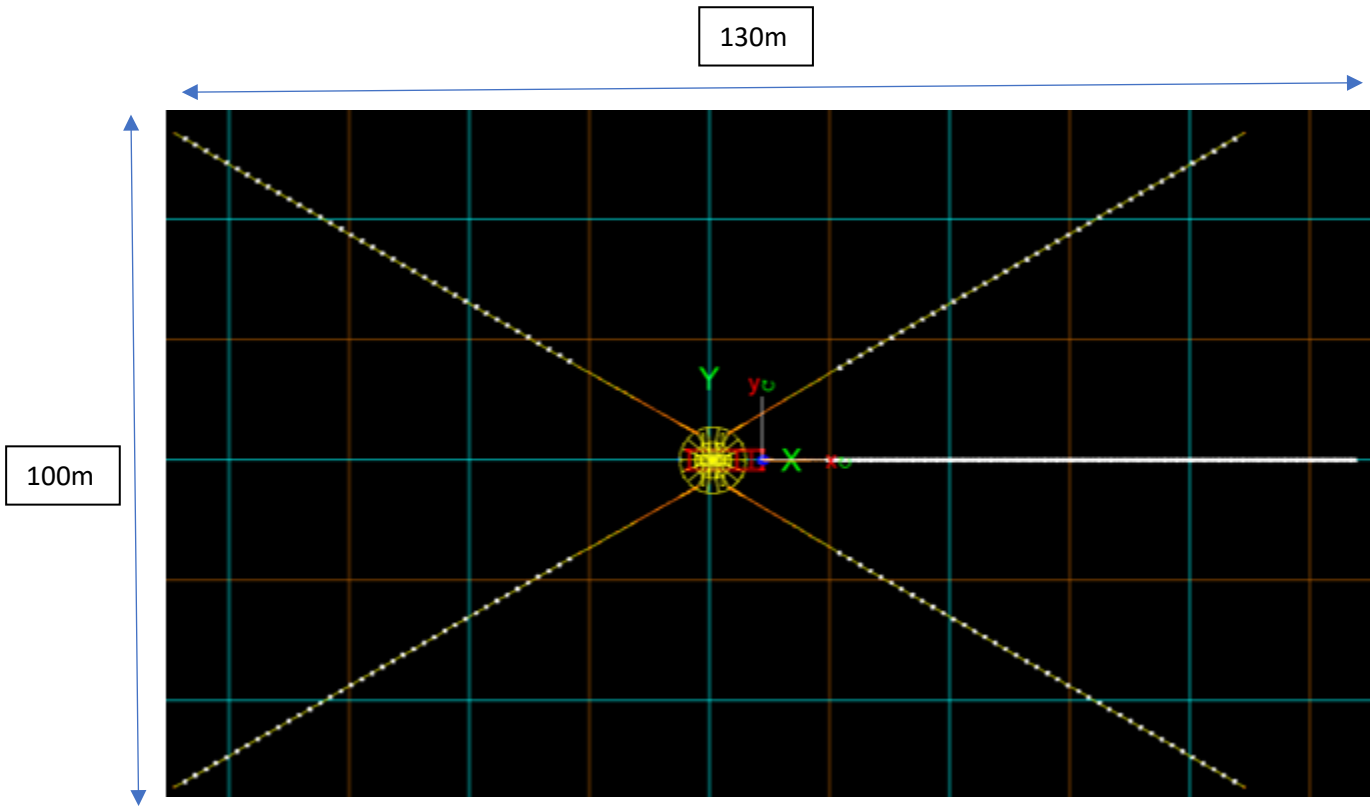


PALM:



OrcaFlex model:





TRL Level: 5

Previous testing:

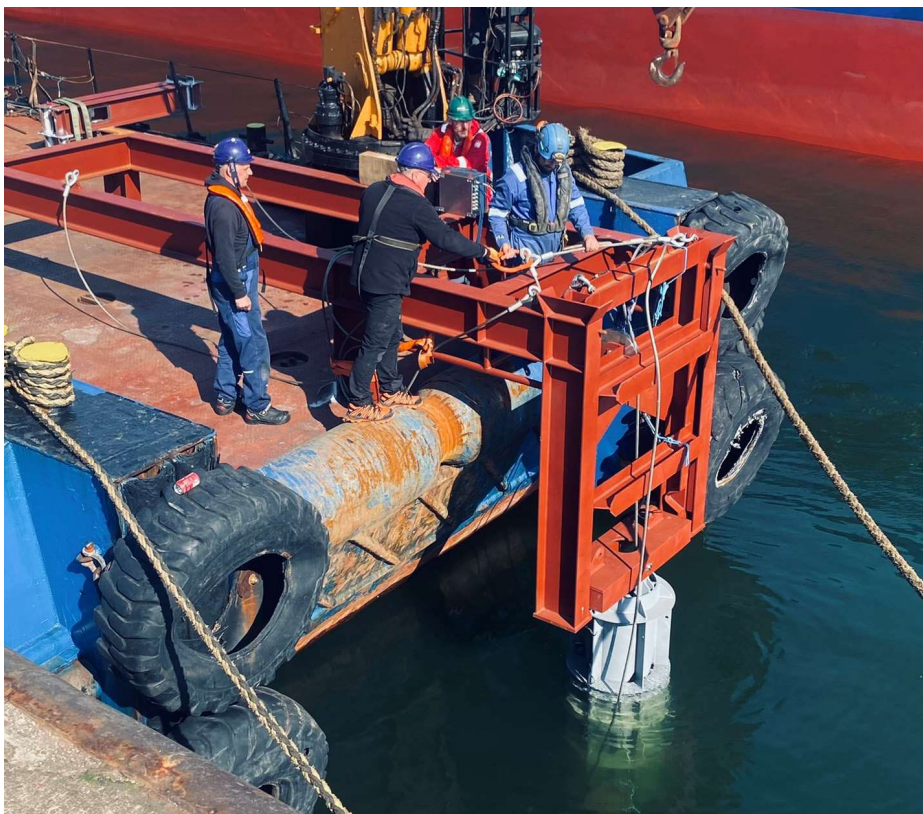
- Laboratory scale testing of a small-scale 3D-printed prototype to prove the principle of the alignment and locking mechanism.



- Workshop/yard testing of the full-scale prototype using a purpose-built test frame.



- Quayside testing that followed the same process as the workshop testing but with the test rig and receptacle cantilevered off a vessel, and the plug moored to the seabed via chains and clump weight anchors.



Moorings design:

Four mooring lines to be attached to buoy with arrangement as follows from buoy end to seabed:

1. Shackle
2. 32mm chain
3. Connecting link
4. Polyester rope 40mm,
5. Connecting link
6. 32mm chain
7. Anchor shackle
8. Anchor