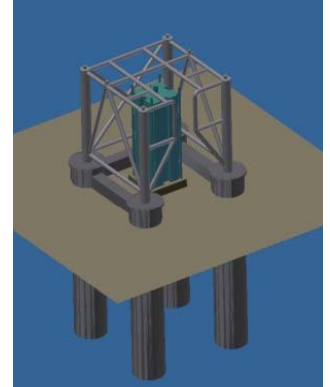
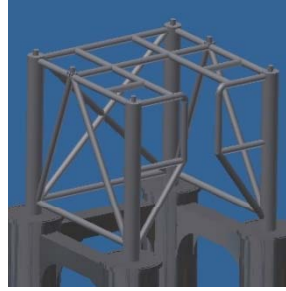


Subsea Wellhead/ Working Platform (SWP)

Fact sheet

- Archimedes had said: 'Give me a footing, and I can move the Earth.'

Joint Venture Development by:



Technical Information:

JOINT DEVELOPMENT

Based on initiative from Bellona, a Task Force was formed including Bellona, Inocean, Aker Solutions and NGI, to assist British Petroleum PLC ("BP") with the ongoing effort to stop the oil leakage from the MC252, Deepwater Horizon incident.

The parties have agreed to jointly develop a concept for a subsea working platform ("SWP") including option for suction anchor base structure for seabed foundation. SWP work-bench will be a practical base for relevant installations to solve mechanical problems and transmit reaction loads to the seabed.

SUBSEA WORKING PLATFORM (SWP)

The purpose of the SWP is to guarantee a strong and stable subsea base around the wellhead from which it is possible to gain access to the BOP and oil well. The SWP will have standard subsea interfaces on its top structure. From these interfaces it will be possible to connect several different devices/ tools to interact with the wellhead BOP and perform interventions. It can also be a base for mounting cameras for permanent use.

The SWP consist of a top section arranged as a frame structure and a bottom section arranged as a foundation base structure.

FRAME STRUCTURE

A frame structure for increased access to the wellhead BOP will be installed and connected on top of a base structure. The frame structure has an opening on one side, in order to be installable around the wellhead BOP without disconnecting the LMRP/marine riser system.

The frame structure is fitted with standard subsea guide system for installation purpose. The structure includes suitable receptacles for installation and connection of subsea working tools for multiple intervention procedures gaining access to the BOP wellhead.

BASE STRUCTURE

In the event where wellhead base structure is not applicable for receiving the frame structure, a base structure consisting of 4 off suction piles welded together as a square structure with opening on one side is preinstalled before landing the frame structure.

The base structure will be positioned on the seabed with the BOP stack in the middle, without disturbing the already connected LMRP/riser system, and suction penetration of anchors will be performed.

The base structure will act as a solid foundation for the frame structure, and can transfer reaction loads from the frame structure into the seabed soil.

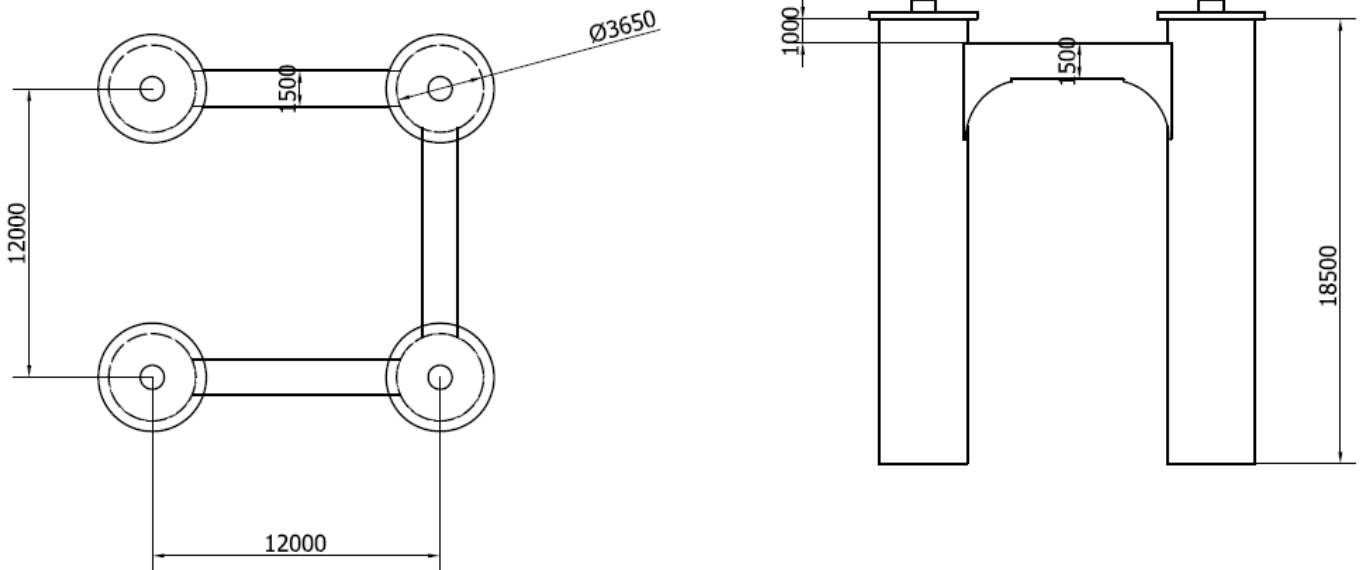


Figure: General Arrangement of SWP Base Structure

OVERALL DIMENSIONS AND WEIGHTS

The approximate dimensions of the SWP Base Structure:

- Height 19 meters
- Length 16 meters
- Width 16 meters

Dimensions of the SWP will be arranged according to needs to provide interface with tools etc.

The approximate weights of the SWP:

- SWP Base Structure installation weight approx 300t
- Additional SWP Frame Structure 50-100t

SWP APPLICABLE TO FACILITATE TOOLS

The SWP may typically facilitate tools such as:

- cutting tools
- subsea power unit
- manipulator arms
- measurement tools
- cleaning tools
- ram tools
- ROV/ AUV station
- lifting rig
- parking slots
- BOP replacement tools
- Guiding tools

GEOTECHNICAL CAPACITIES

Preliminary, tentative calculations indicate that the 4-pile system consisting of four suction piles in a square with pile diameter 3.6 m, penetration depth 18 m and c/c distance of 12m has the following capacities:

- Vertical uplift: $1650\text{kN/pile} \times 4 + \text{weight} = 10.6\text{MN}$
- Horizontal load acting 2m above sea floor: 2.5MN
- Torque around centre: 80MNm

These capacities are valid when the different loads act separately. If they act simultaneously, the capacities for the individual components will decrease. The capacities are failure loads with a load factor of 1.0.

The piles are assumed to be rather stiff both with respect to bending and axial load, and they are interconnected by a rigid cap at the top at sea floor level. The submerged weight of the system is assumed to be 4 MN (400t).

The soil profile is assumed to be soft clay typical for the area, including a material factor of 1.3.

The above capacities are based on preliminary dimensions of SWP. The size of suction piles can increase and reduce the capacity and also the weights depending on the needs specified for the applicable tools.