

**Technical Specification  
Welding Habitat 01**



**Designed and manufactured to Lloyds & IMCA Standards**

**Welding Habitat with connection clamping for Transfer under Pressure**

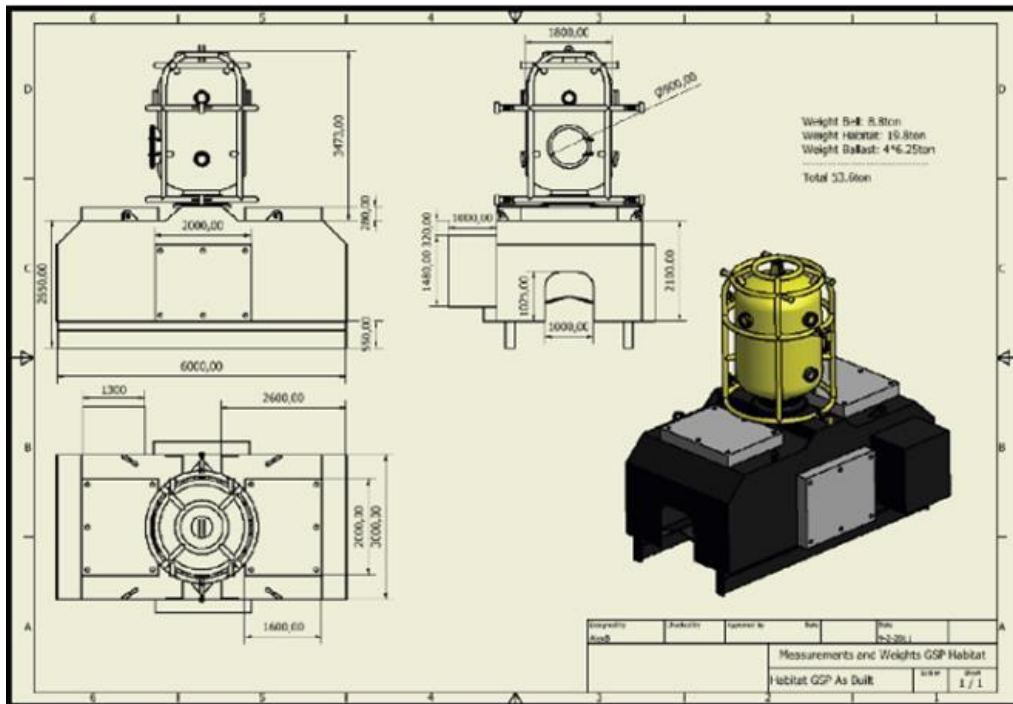
**Max. Diving Depth: 300 metre Saturation Diving**

**Dimensions: 6.00 m x 3.00 m x 2.10 m**

1 INTRODUCTION

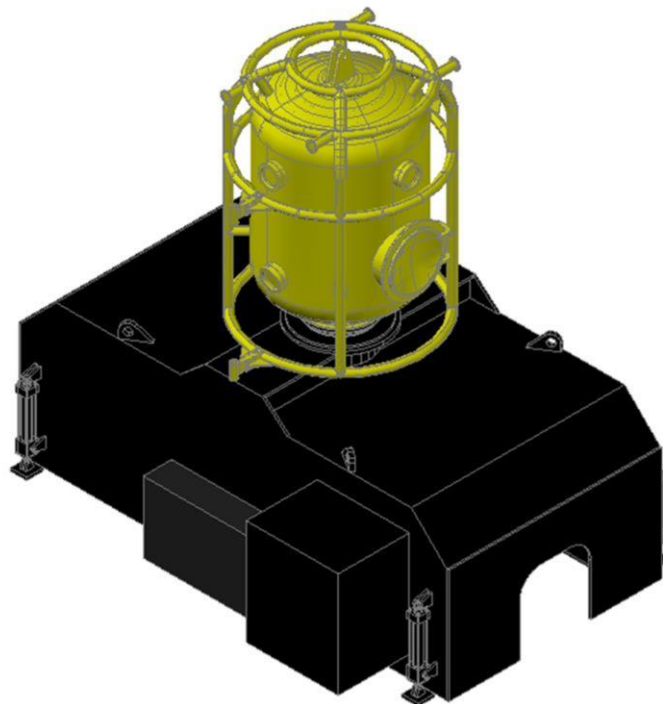
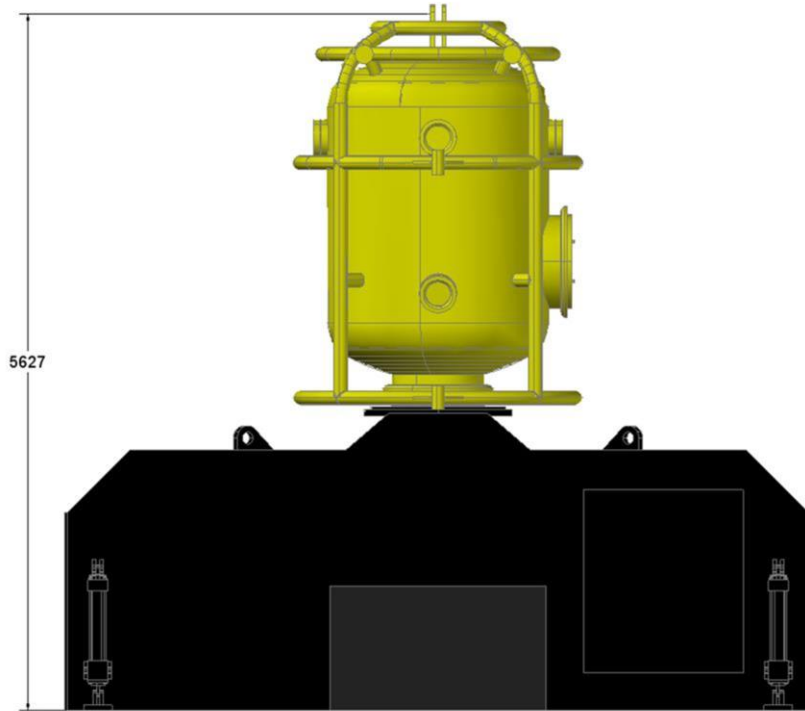
Creating a dry space underwater can be done with several technics. One of these technics is by means of a so called habitat. A habitat is a confined space underwater in which the air pressure in the chamber is slightly higher than the water pressure outside the chamber. Because of the difference in pressure the chamber will stay dry and personnel and material can be locked in by means of a pressure chamber on the surface.

The habitat weighs about 55 tons. The high weight of the habitat is necessary to compensate the positive buoyancy of the air chamber underwater. The forces that work on the steel construction of the chamber are minimal because the pressure difference inside and outside the chamber are minimal. The DCN Welding Habitat 01 has been designed to allow diving operations to a water depth of 300 msw, either in full saturation, mixed gas or air diving range.

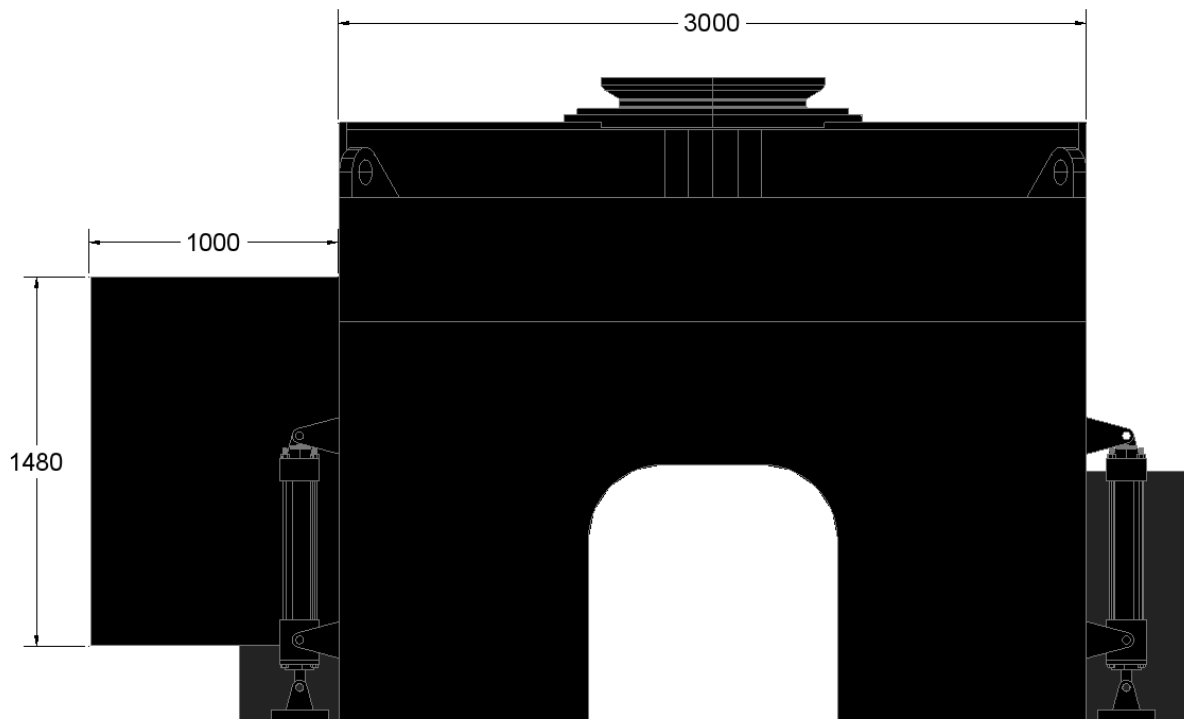
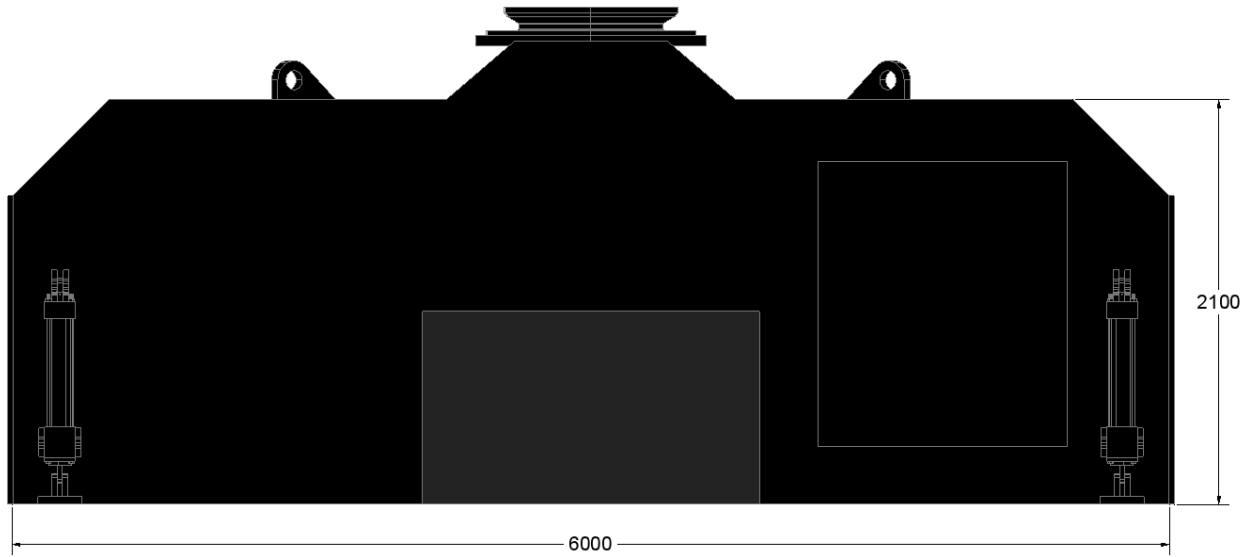


## 2 THE HABITAT & SAFEHAVEN LAYOUT

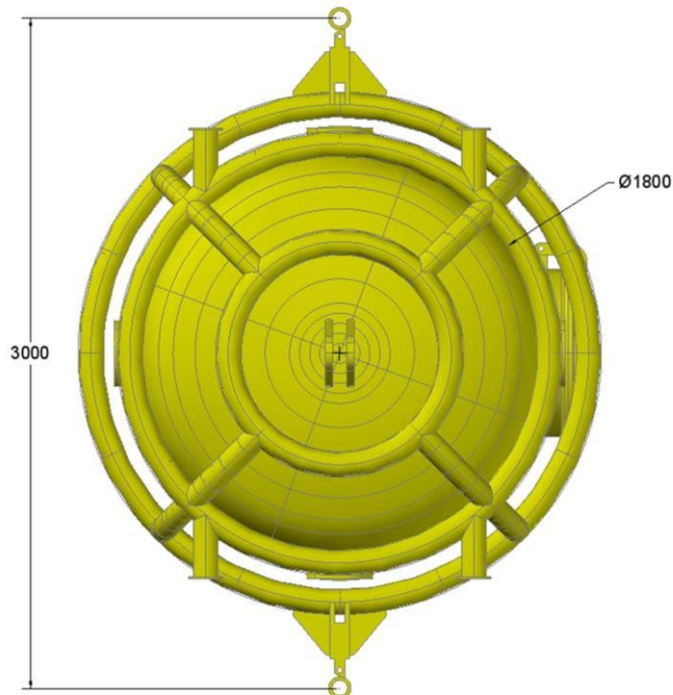
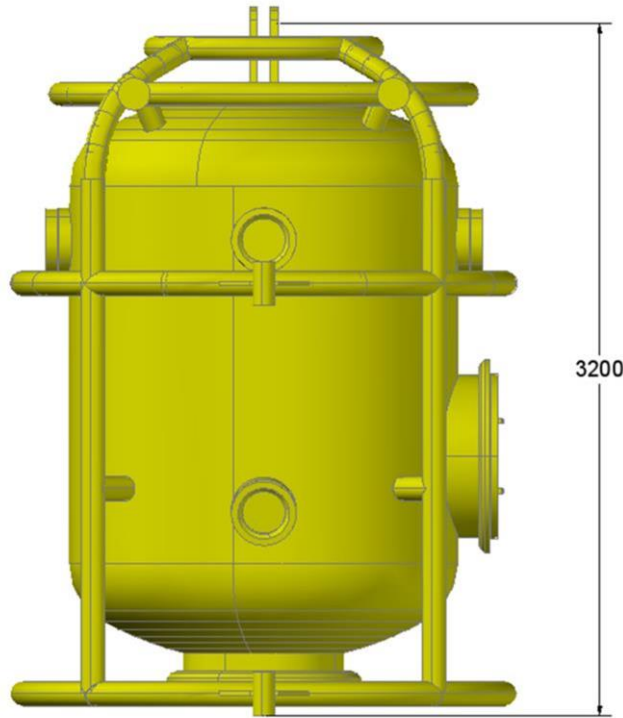
*Schematic of Habitat and Safe-haven*



*Schematic of Habitat*



Schematic of Safe haven





## 2.1 Habitat

The Habitat including safe haven will be placed at the bottom. When the habitat system is placed at the bottom and stability is proven, the superintendent will give the go ahead for dewatering the habitat.

Should the water seal be lost, the uppermost part of the habitat, 'the Safe Haven' is un floodable and is equipped with Survival equipment.

## 2.2 Safe Haven

The "Safe Haven" acts as a diver refuge if the vessel is separated from the Habitat.

The "Safe Haven" is an area at the top of the habitat that is isolated by steel rings allowing for an area that is not floodable in the upper part of the habitat (See drawing). The area is equipped with Survival suits, battery powered scrubbers and lighting, through water communications, on board breathing gas, food and water.

## 2.3 Wet Entry/Exit Door

Divers can enter or leave the habitat through the side door.

## 2.4 Safe Haven Atmosphere Filtration System

Two scrubbers are attached inside which sucks the Carbon dioxide / acid gas. Acid gases can be reduced by oxides, peroxides and hydroxides. Hydroxides are used in most scrubbers because of their stability and ease of handling.

The hydroxides most commonly used are:

1. Sodium.
2. Potassium.
3. Calcium.

The name product 'Sodasorb' is a mixture of all three hydroxides with the major component being calcium.

The reaction occurs in three phases; gas, liquid and solid:

1. Gas; the CO<sub>2</sub> must come in contact with the pours of the granules.
2. Liquid; The pours of the granule hold water containing dissolved hydroxides. Optimal moisture content of the granule is 12 to 19%. More or less moisture will slow the reaction.
3. Solid; The undissolved hydroxides structures the matrices.

The absorption of CO<sub>2</sub> is a chemical process. The CO<sub>2</sub> comes in contact with the moist film containing the dissolved hydroxides and is taken into solution forming carbonic acid which reacts with the hydroxides to form sodium carbonate. This process regenerates the water and the sodium carbonate reacts with the hydrated lime to form calcium carbonate, caustic soda and caustic potash. The process produces excess water and heat. The process works best when the three conditions of gas, liquid and solid are maintained, the liquid being the major concern. Too little liquid will not allow the first step to occur. Too much liquid will dissolve the granules and form a paste like composition which closes the pores in the granules.

## 2.5 Manning Of Control Room

An underwater habitat operation shall have a Dive & Habitat Control Room.

A DCN technician shall be available during habitat operations. In case of system malfunction: DCN Technicians are on call to assist as required.

## 2.6 Dive control

The Diving Supervisors shall be located in dive control as long as Diver and Bellman are deployed. A Diving Supervisor can be relieved during breaks, after adequate briefing by:

- Another Diving Supervisor,
- The Diving Superintendent.

They shall be able to communicate with Habitat control through a minimum of two different communication systems.

## 2.7 Habitat Control

A Habitat Supervisor will be located in Habitat control as long as Divers are inside the Habitat. They shall be able to communicate with Dive Control through a minimum of two different communication systems. A Habitat Supervisor can be relieved and/or supported as required by:

- Another Habitat Supervisor,
- A Diving Supervisor.
- The Diving Superintendent.