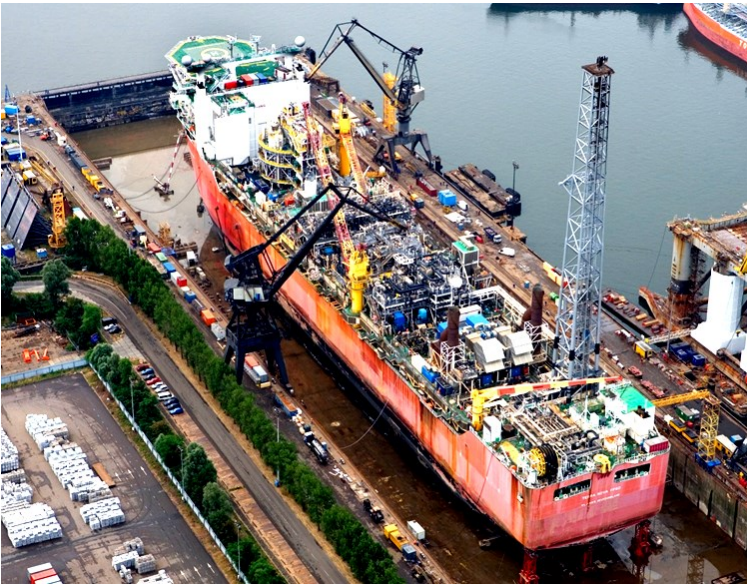


TERRA NOVA LIMPET COFFERDAM - NEWFOUNDLAND, CANADA



FPSO Terra Nova in dry-dock in Scotland



Assembled and launched limpet cofferdam ready to be positioned

SERVICES PERFORMED

- ◆ Conceptual & Detail Structural Design of Limpet Cofferdam
- ◆ Design of Buoyancy Tanks and Ballasting System
- ◆ Design of Seals for Mating Cofferdam to FPSO Hull
- ◆ Design of Dewatering System for Limpet Cofferdam
- ◆ Test Cofferdam and Hull Mock-up Design
- ◆ On-site Engineering during Fabrication and Operations

PROJECT INFORMATION

Year of Completion: 2012

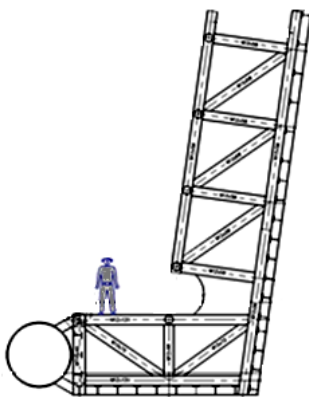
Client: Peter Kiewit Sons Ltd.

Owner: Suncor Energy

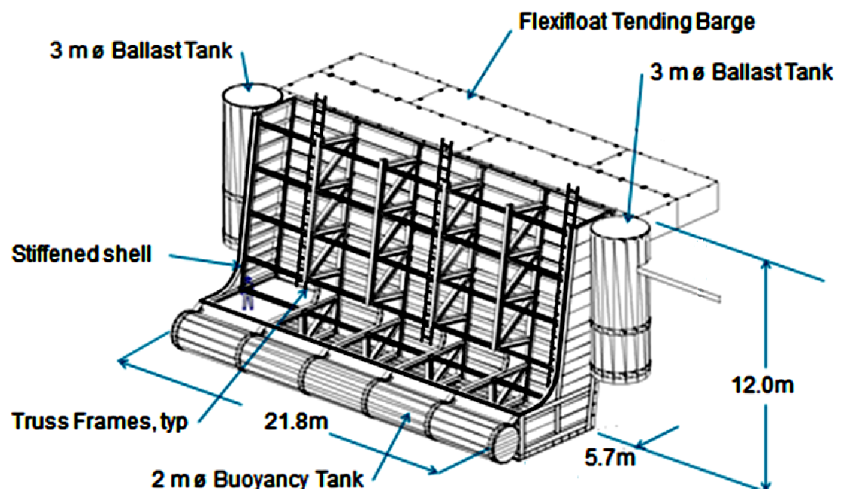
Bittner-Shen Consulting Engineers was hired by Peter Kiewit Sons Ltd. to design a limpet cofferdam for the bilge keel refurbishment of a floating FPSO vessel while at dock-side in Marystown, Newfoundland, Canada. Refurbishment of the vessel hull would have typically required placing the vessel in a dry-dock. However, the vessel was so large that the closest dry-dock of sufficient capacity was the dry-dock where it had been built, on the other side of the Atlantic in Scotland.

The limpet cofferdam was required to be launched and floated into position against the side of the floating FPSO

when the vessel was at dock-side with a draft of 7.3m (24-ft) and then de-ballasted to seal the cofferdam tight against the vessel hull. When in position and sealed, the cofferdam was dewatered and man access was provide in-the-dry to the side and underside of the hull. Once the refurbishment at one location was completed, the cofferdam was re-flooded and reposition to a new location along the hull. The cofferdam had a total height of 11.733m (38.7-ft) and a total length of 21.5m (70.5-ft).



Typical cross section of limpet cofferdam



Isometric view of limpet cofferdam, buoyancy tanks and tender barge



BITTNER-SHEN CONSULTING ENGINEERS, INC.

SPECIALTY ENGINEERING: STRUCTURAL · GEOTECHNICAL · CONSTRUCTION · MARINE

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