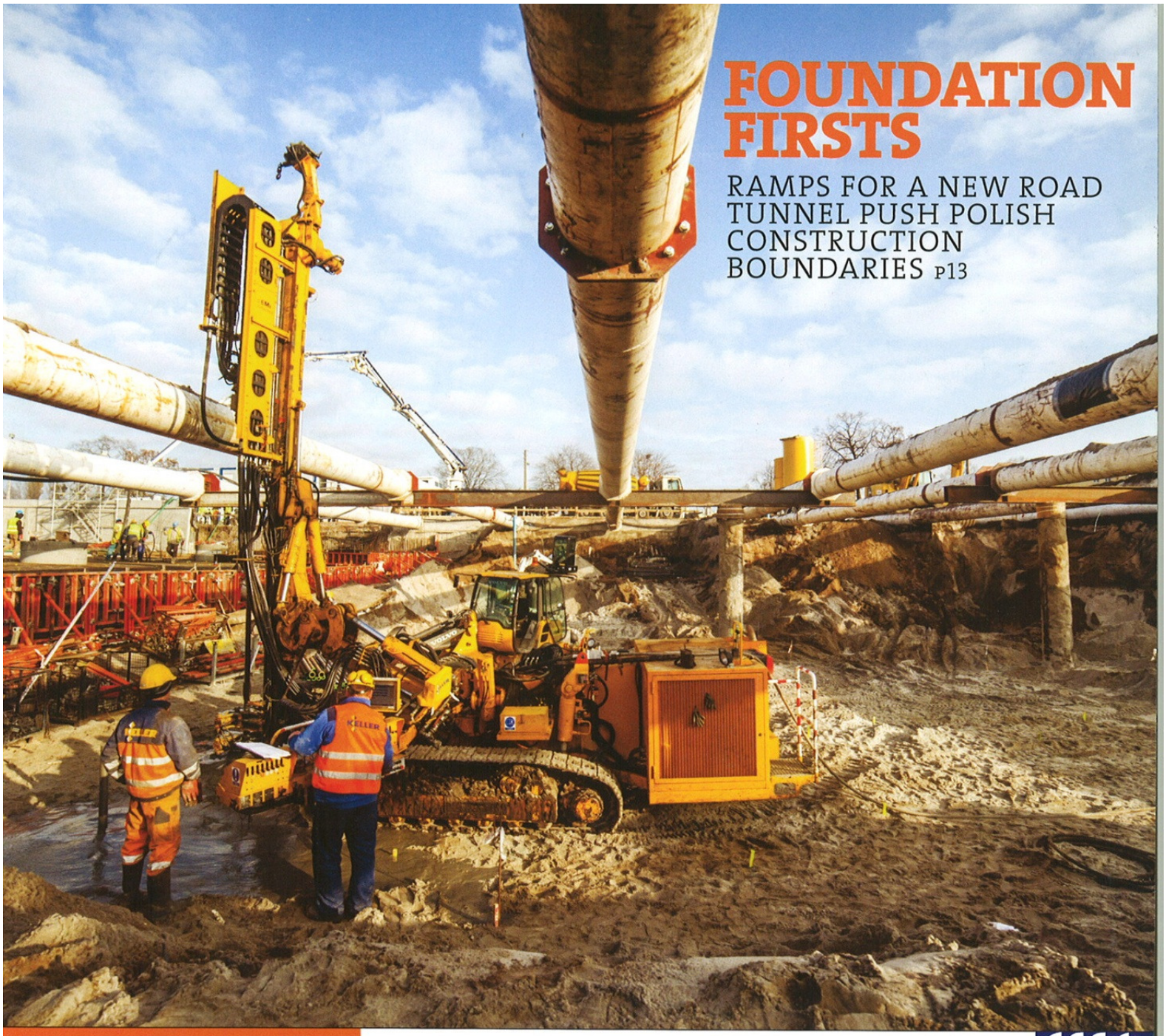

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EUROPEAN FOUNDATIONS

SUMMER 2013
MAGAZINE OF THE EFFC

08
ENVIRONMENT

SALVAGING THE SITUATION

By Claire Symes

While the human tragedy of the sinking of the Costa Concordia cruise ship off the coast of Italy early last year may have faded from the headlines, work is still underway to prevent the accident becoming an environmental disaster.

Specialist drilling and grouting work is being carried out in the protected waters to create the foundations for the platform that will be used to right the 114,000t ship before it is towed away to be scrapped.

Pilot error is believed to have caused the 290m long, 35.5m wide cruise ship to strike rocks off the Isola del Giglio on Italy's west coast on 13 January 2012. The accident led to the loss of 32 lives during the evacuation of the 4,200 passengers and crew on-board.

The rocks the ship hit are part of a Marine National Park and close to coral reefs, so even while the search for survivors was still underway over 2,000t of fuel was being pumped out of the ship to minimise pollution.

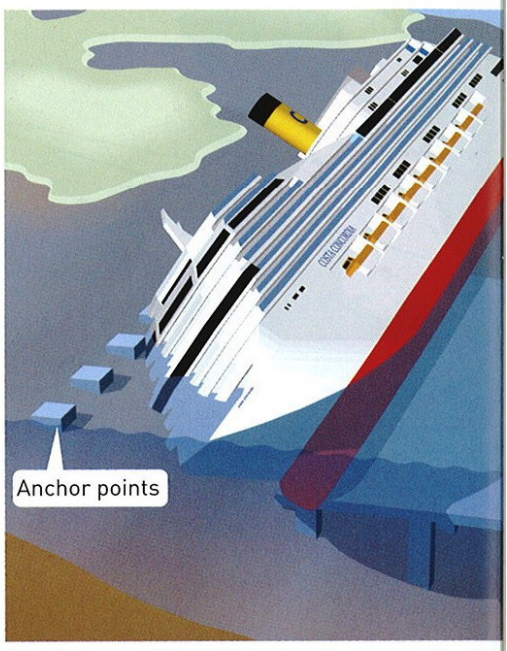
The focus on environmental issues has continued during the salvage operation, which is being carried out by Titan and Micoperi and is estimated to cost ff200M. The companies won the contract by proposing to tow the ship away in one piece and the joint venture has described the operation as "the most complex salvage operation ever attempted".

The description is accurate because not only is the ship in protected waters but it is also delicately balanced on a steep slope and at risk of sliding into deeper water. The salvage contractors brought in Trevi to carry out the foundations part of the operation, which will reduce the risk of further damage to the local environment during the lift.

Trevi is using Wassara down the hole (DTH) hammer drills to secure 15m long anchors both up slope and down slope from the wreck to create 12 anchor points which will be used to attach wires to a specially-designed 30t metal platform structure below the ship. These wires will pass below the ship and help prevent the vessel from sliding into deeper water as metal sponsons structures, attached to either side of the ship, are progressively pumped free of water.

The drilling operation is being carried out using a barge-mounted Soilmec SM-21 drilling rig. According to Wassara, its DTH hammers were selected for the operation because its water-powered percussive drilling technique does not use oil to lubricate the hammer, further reducing the pollution risk.

→ COSTA CONCORDIA



The focus on environmental sensitivity also extended to the grouting elements of the work and this part of the process is being undertaken by subsea grouting specialist Found Ocean. As well as carrying out grouting work on the platform anchors, Found Ocean will also use 14,000t of cement from Italcementi to build a grouted insitu embankment and grout mattress that will provide a flat, stable platform for the ship's hull to rest on once it has been rolled upright.

In order to meet the environmental requirements of the salvage project, the seabed must be returned to its original condition and the grout bags, each of which

IN SUMMARY

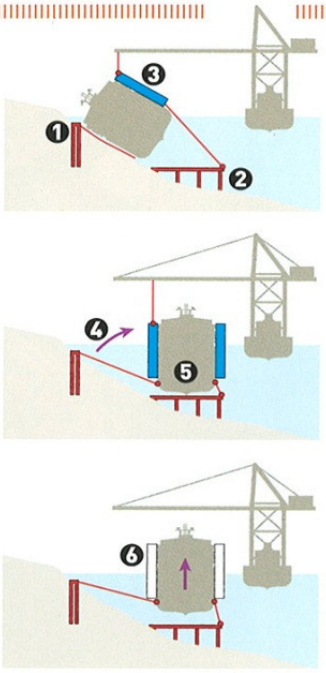
Specialist drilling by Trevi and grouting work by Found Ocean has been carried out in the protected waters around the submerged Costa Concordia to create the foundations for the platform that will be used to right the 114,000t ship by salvage specialists Micoperi and Titan before it is towed away to be scrapped.

WHERE?

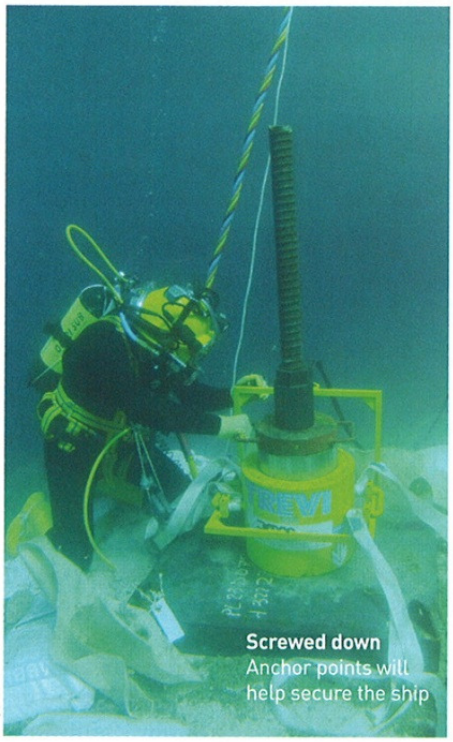
IN FIGURES

114,000T
Weight of Costa Concordia

2 days
Time it will take to right the ship



1. The ship is secured to the anchor points
2. A platform is constructed
3. Large floating pads of steel (sponsons), filled with water are attached to one side of the ship
4. The ship is erected to stand on the platform
5. Large floating pads of steel are attached to the other side of the ship
6. The water is pumped out from the floating pads. The ship will now float and can be towed away for scrapping



Screwed down Anchor points will help secure the ship

will weigh up to 70t, are designed to be lifted back out of the sea when the salvage operation is complete. They will then be taken ashore for processing and recycling.

In late April work started on attaching the first of the 30 metal sponsons – 15 on each side – to the ship's hull. The rollover operation itself – known as parbuckling – is expected to take at least two days, as it must be done painstakingly slowly to prevent further damage to the weakened hull.

Titan and Micoperi have said that the Costa Concordia will be re-floated this summer and once afloat, the ship will be taken to Sicily for dismantling.

Tipping point The drilling rig at the site of the wreck

WHO?

The main salvage contract is being carried out by Micoperi and Titan, working in joint venture, but the specialist drilling work has been sub-contracted to Trevi and the grouting operations to Found Ocean.

CHALLENGES

There is a strong environmental focus in the salvage operation. Titan and Micoperi won the contract through the proposal to tow the ship away in one piece and the joint venture has described the operation as "the most complex salvage operation ever attempted". As well as lying in protected waters, the Costa Concordia is also delicately balanced on a steep slope and at risk of sliding into deeper water.

MORE INFORMATION

www.micoperi.com
www.titansalvage.com
www.theparbucklingproject.com