



EXPLOSIVE DEMOLITION AWARD

Winner **Liberty Industrial**

Country Australia

Australian blast

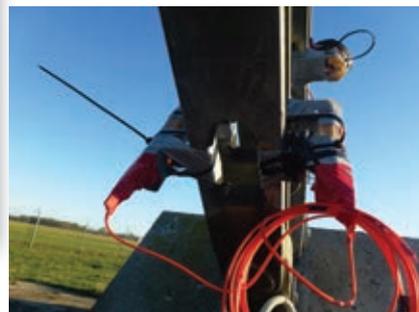
The 432m Omega Tower is the tallest structure ever to have been demolished in the southern hemisphere



Standing 432 m (1,418 ft) high, the Omega Transmission Tower in Darriman, Victoria, Australia was the tallest structure in the Southern Hemisphere until its demolition on 22 April 2015. Contracted by the Australian government's Department of Defence to carry out the demolition, Liberty Industrial used controlled explosive techniques to bring the redundant naval communications tower to the ground.



The Tower standing prior to the implosion



Setting the charges

The Department of Defence imposed tight time frames, with Liberty Industrial contractually bound to complete demolition within six weeks of the contract award date. The project team, including experienced Three of the tower's main supports, comprising six cables, two at each support base, would be cut at the plate connection using explosive cutting charges, releasing the tower to fall in the direction of the remaining tower base supports, using the weight of the tower cables to help topple it in a controlled manner.

Liberty's project management team prepared a comprehensive Blast Management Plan, an Explosives Security Plan, a Demolition Work Plan and other documentation critical for safely managing demolition works involving the controlled use of explosives.

TIME CONSTRAINTS

Due to the very limited amount of explosive work completed in Australia each year, the preferred explosive charge, a copper sheathed linear cutting charge, was not available within Australia, and could not be imported to suit the project timeframe. The obvious advantage of the linear cutting charge is that it is custom-made for this application and has well established cutting depths.

To meet the tight project time constraints, Liberty worked with a local explosives supplier to use the explosives it had available, namely PE and Composition B. The company spent two days testing explosives at a firing range in the Blue Mountains, around two hours from Sydney. It tested the available explosives on steel plates fabricated to replicate the cable support stay plates that it was planning to sever with the cutting charges to determine exactly what depth they could confidently cut through.

After the testing days, Liberty was satisfied that it could at least sever 50 mm thick plates with the Comp B explosives charges. However, to ensure that there was some redundancy in the charges, the company decided to undertake preparatory oxy cutting on the cable stay support plates to ensure it had a maximum of 40 mm (1.6 inch) thick steel to cut.

With some of the cable stay support plates up to 80 mm (2.4 inch) thick at the outermost support, Liberty used GHD Engineering, its preferred structural engineering company, to complete a full structural review on the tower and its support stays, to develop a preparatory cutting scheme that ensured it had no steel thicker than 40 mm to explosively cut while ensuring the tower remained structurally sound until the cutting charges were initiated.

In the days before the implosion, oxy-cutting works prepared the 12 designated cable support stay plates.

Liberty also carried out the controlled release of one of the 1.5 km aerial cables to prevent collateral damage to existing buildings that were to remain on the site. It used a second aerial cable that it had released from the opposite side of the tower and a 36 tonne excavator to secure the tensioned cable before separating it from its anchor. Liberty was able

to control the release of the cable by tracking it in with the excavator to ensure it was clear of the retained buildings. All other guy and aerial cables were retained to maintain the structure's stability.

The day before the implosion, the explosives were affixed to the 12 designated anchor plates and all necessary checks were carried out in line with the Blast Day Management Plan. Two

security guards remained on site during the night to ensure the explosive's remained secure.

On the day of the implosion Liberty established a 1,000 m exclusion zone around the tower, halting traffic on the adjoining highway for a short time while the demolition was undertaken. Representatives from Victoria Police, WorkSafe Victoria and the Department of Defence attended the demolition to observe, record and support the project.

After comprehensive planning, calculated engineering and careful preparation delivered the implosion was precisely executed and the structure safely grounded in a matter of seconds, reacting as planned and anticipated. The cutting charges successfully severed the plates, releasing the guy cables and causing the lattice truss tower to destabilise and collapse upon itself in four large sections.



The end result – the tower lies on the ground awaiting material recovery and recycling