Information Item	**Completing one of the world's first six-point crane release under water**
Sponsor	CEO
Date	September 2019

Completing one of the world's first six-point crane release under water

After the 230 metre-long, 30m wide dredge *Fairway*, widened, lengthened and deepened Lyttelton Harbour's navigation channel – an ambitious and untested plan was put forth to install new navigation aids.

Smith Crane & Construction's Piling Manager, Matt Draper, successfully tendered the project to install several spar buoys along the channel without the use of divers – as is the usual practice.

Improving maritime safety, a spar buoy is a tall, thin buoy that is anchored to the sea floor via a concrete mooring block and chain – allowing it to float upright in the water.

This project's buoys comprised a large platform on top where maintenance can be carried out on the various devices, such as solar panels, light controls and radar reflectors.

Generally, installing spar buoys involves two winches – one to the lift the block and another to lift the buoy. As they're both lowered in the water, the buoyance of the structure straightens it. Then a diver would disconnect the lifting points underwater.

But Matt – a 36-year-old Manager with Smith's Pilling Division – wanted to use one barge and one lift, and eliminate as much risk as possible.

"I thought 'flip, how are we going to lift them?' because you've got to lift this thing from horizontal to vertical, then attach the sinker block through the 100 millimetre chains and shackles, then lift the whole thing and put it in the water – then disconnect it," Matt says.

Drawing on his piling background, the Dawson Quick Release – a spring-loaded clamp with a rope attached to it – seemed the obvious method to his disconnection problem.

"So, I came up with a cunning way to connect everything to the release and have some rope 30 metres off the barge – then once the anchor block is on the channel floor, we can actually release this thing without having to put a diver in the water," Matt remembers.

Easier said than done; Matt still had many other elements to contend with – the elements for one, calculating the correct lifting gear and spreader as well as planting the buoys within 10mm of specific GPS coordinates.

"Originally, I wanted to suspend the anchor block through the structure itself, but the designers of the structure said they weren't keen on that. They weren't going to guarantee that it wouldn't elongate and stretch, and it wouldn't hold the weight of the 24-tonne block.

“We had to have as much tension on that chain [connecting the block to the buoy] without having the weight of the anchor block on the structure.

“It was a bit of a dance, but we got there. On the anchor block there is four points to lift from. We roped around that so that would fit inside the releases and then the lift became a ship’s point remote release underwater.”

The plan took about an hour to finalise but researching spar buoys, speaking to experts and consulting with Smith’s crane managers about the lift procedure and sequence – as well as necessary calculating lengths and finding the right lift gear – took a few weeks.

A couple of test lifts later and Matt felt ready: “I said the practical way to do it was with a 120-tonne crane on a 40m barge.”

“But it’s one thing getting the releases right above ground, it’s another to do it underwater. It was a bit of a leap of faith – I mean, I was 95 per cent confident it was going to work, to the point where I didn’t bother putting divers on stand-by [in case it didn’t work].”

After judging the timing of incoming swells – in between walking the crane to the edge of the barge, while reading the GPS reader – and heeling the craft 1.5 degrees, they were nearing the buoy’s entry point.

There was a bit of luffing and slewing to get the buoy within 10mm of the GPS coordinates before Matt ordered the buoy into the water. He admits it was nerve-wracking stuff.

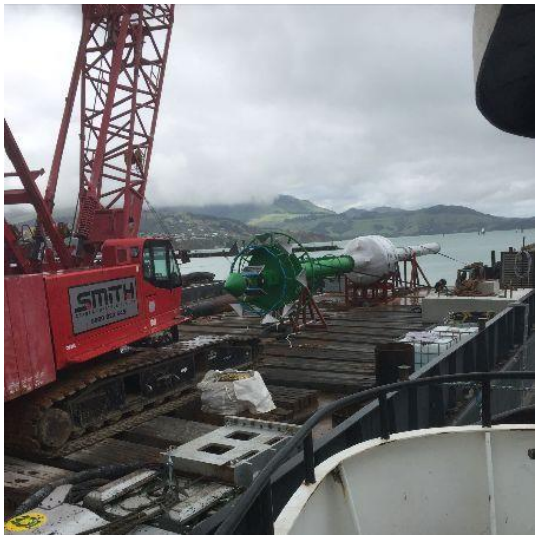
But when he “popped” the first release, and it “went perfectly”, Matt knew the project would be a success.

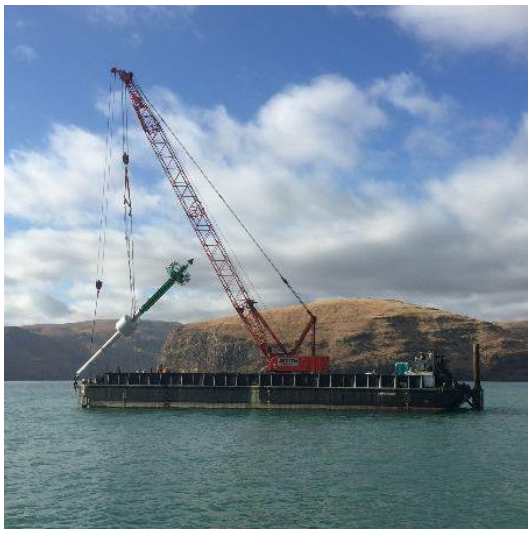
“Mate, I was absolutely ecstatic – to have a plan like that come together. Everything was just such a fine balance. It was certainly one of the most interesting jobs I’d taken on – to be honest I didn’t even know what a spar buoy was before this.

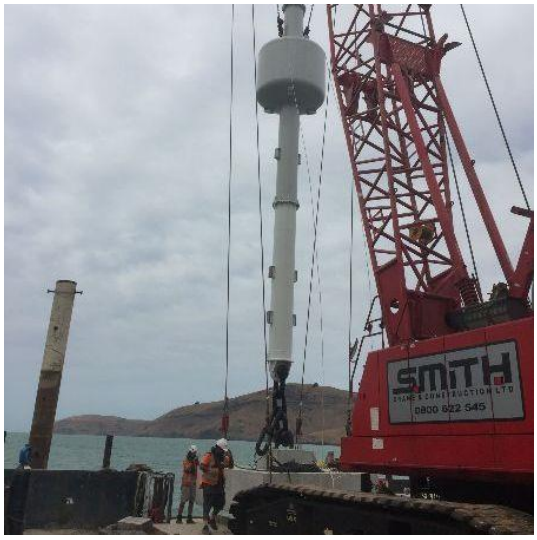
“To pull this off and come away with three gold stars, it just goes to show you the diverse capabilities of Smith Crane & Construction.”

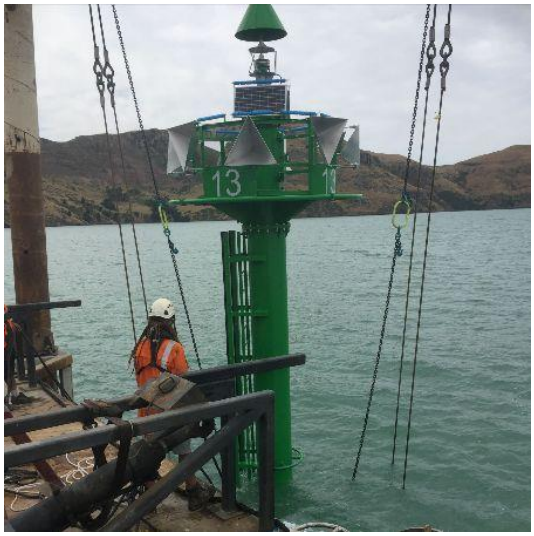
Matt Draper

Smith Crane & Construction’s Piling Manager









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