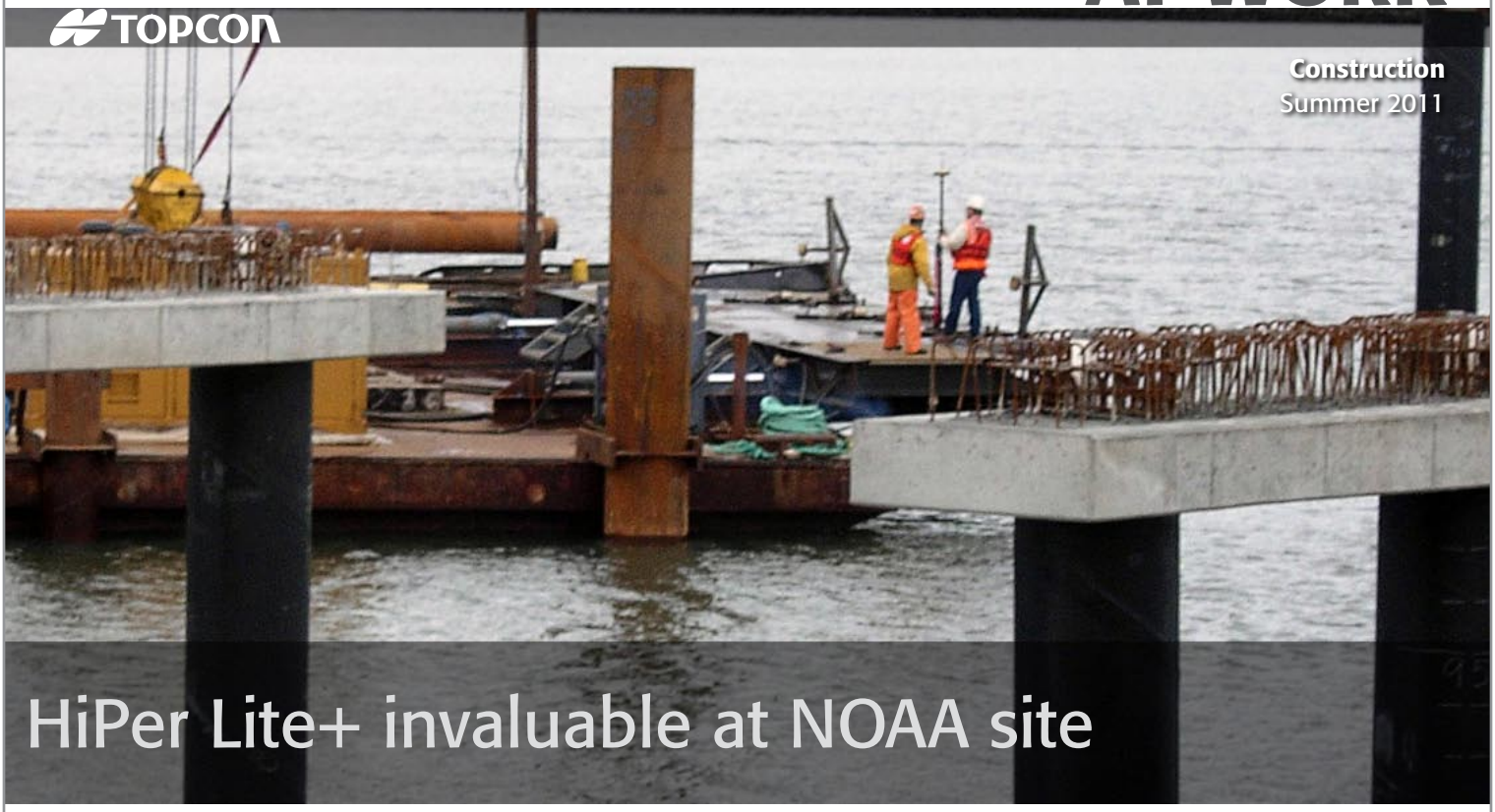
AT WORK

TOPCON



Construction
Summer 2011

HiPer Lite+ invaluable at NOAA site

WCC's assistant construction manager, Julian Koerner

Combine environmental restrictions, underwater construction, challenging weather, delays in permitting and a tight schedule on a high-profile federal construction project. This is exactly the scenario that West Coast Contractors (WCC) faced in constructing a 1,300-foot-long pier for the Port of Newport's National Oceanic and Atmospheric Administration's (NOAA) marine operations center in Newport, Ore., in late 2010 and early 2011. Problems and more problems created a need for making up for lost time, which necessitated a discernible edge of some kind to get the project back on schedule.

WCC had formed a joint venture with Portland-based Andersen Construction and began constructing the pier in November of 2010. A 10-day delay in the water work permit and rainy, windy weather had already put the project behind schedule. All underwater work had to be done between by mid-February 2011 for minimal

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Company: West Coast Contractors

Location: Coos Bay, Ore.

Project: Port of Newport's National Oceanic and Atmospheric Administration's Marine Operations Center-Pacific

Location: Newport, Ore.

Topcon Products:

HiPer Lite + base and rover stations
FC-120 data collector
Pocket 3D software

Topcon Dealer:
The PPI Group
Portland, Oregon
www.theppigroup.com

HiPer Lite+ invaluable at NOAA site

'The template and the [GNSS] have helped enhance this work a lot with the layout. It's handy having it right there. We have real-time data; we don't have to wait for a total station to do the positioning. That rover comes in quite handy, to say the least, as a time savings.'

– Greg Damms, West Coast Contractors

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disruption to fish in Yaquina Bay. By mid-December, WCC's assistant construction manager, Julian Koerner, EIT, reported that WCC had nearly caught up. By then, WCC was using a barge to position piles with a crane and driving them into the bay by means of jetting, and impact and vibratory pile driving. "The schedule put us in the hole, but we're gaining," he said. "We've made up most of the delay at this point and I anticipate that with the way things are progressing, we'll continue to do so and I anticipate that we'll finish at or ahead of schedule."

LEFT: WCC set up a Topcon HiPer Lite+ base station on shore. RIGHT: WCC's Greg Damm using HiPer Lite+ rover.

The pier bents are spaced 40 ft apart and consist of three 36-inch-diameter piles spaced at 13 ft on center transverse to the deck. In order to make positioning the piles easier, WCC deployed a steel template equipped with two hydraulic rams—one that moves the template in and out and another that moves it from side to side—on the side of the barge. The template has three openings for piles, the positions of which were plotted on a Digital Terrain Model (DTM) developed by DirtLogic, Gladstone, Ore.

WCC set up a Topcon HiPer Lite+ base station on shore. WCC's Greg Damms held the HiPer Lite+ rover over the water to pinpoint the location of the next pile, referencing coordinates in the DTM via an FC-120 data collector mounted on the rover pole. A signaler indicated to tugboat operators which direction to move, and how far. Once the template was in the approximate position of the next pile, spuds—i.e., vertical steel shafts—were dropped in the water to hold the barge in position and the template was moved to within the positioning tolerance of the next pile, with Damms checking the position on the FC-120. The crane then lowered the pile into the template opening and a final check was done on the position before the pile hammer drove the pile into the bay bottom. Pile elevations were checked using markings on the piles and laser levels; Koerner reported that a few inches were cut off of a few piles to hit the elevation.

The HiPer Lite+ was used for more than positioning the piles, Koerner pointed out. "We also have to as-built the pilings and as-built the precast concrete pile caps," he said. "There's a little bit of position movement with the caps so we use it to get that correct. We also use it to lay out our grading, our shoreline restoration and excavation in front of the office building." The system was also used to check the elevation of precast deck slabs beneath the topping slab.

Time savings are a major benefit to using GNSS on this project, according to Damms. The HiPer Lite+ system can be up and running in about three minutes at the start of a shift—much faster than surveying processes involving the deployment of prisms. He determined that the system paid for itself by the end of 2010—before the first project in which WCC employed the system was even completed.

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