



Nearly there – the view in December

# An Economic Springboard?

**Eastern Canada's province of New Brunswick has been struggling for years to diversify its economy as traditional industries such as forestry and mining decline – it may now have found the answer, writes STEPHEN OUELLETTE**

In an area already suffering economically, the additional pressures of the global economic crisis have been keenly felt, but on New Brunswick's northeastern shores, the Port of Belledune's targeted expansion – designed to position the port as a gateway and thus a major player in global logistics – has also brought high hopes that it will be a catalyst to transform the entire regional economy.

## FIRST STEPS

Situated on a protected bay feeding into the southern Gulf of St Lawrence, the port was built in 1968 to address the shipping needs of a local smelter. It has since become a major seaport and one that offers some of the shortest shipping routes between points in Europe and North America.

Aiming to enhance its operations and competitive capabilities, Belledune Port Authority (BPA) stressed its current

assets and its potential to serve as an anchor for that regional development in order to win funding for an expansion through the Canadian government's C\$4Bn *Infrastructure Stimulus Fund* (ISF). The ISF's an aggressive strategy that's aimed at kick-starting the stagnant Canadian economy by injecting funding into provincial, territorial and municipal construction-ready infrastructure rehabilitation projects over a two-year period.

The argument for funding was further validated when BPA promoted itself as a key participant in the *Canadian Atlantic Gateway* initiative, a federally funded programme aimed at gaining recognition for Canada as a significant link in the global transportation system (similar in concept to the *Asia-Pacific Gateway* project, see *DPCs passim* – ed). In addition, the BPA's confident that port improvements will stimulate regional economic growth and points

to successful new ventures, such as its multipurpose facility for the fabrication, assembly and layout of preassembled steel units that is being developed. For an area that's lost many employers in recent years, the prospect of new jobs provides hope to many.

The C\$75M Port of Belledune expansion project includes both terrestrial and marine components separated by the tender and award of two prime contracts. The marine element includes construction of about 400m of concrete caisson dock wall along with concrete caisson ro-ro and barge loading facilities. In total, the work's worth C\$22M – and BPA's engineer, **Gemtec Consulting Engineers and Scientists**, awarded it to eastern Canadian heavy civil and marine contractor **McNally Construction** in April last year. McNally, which has decades of experience in marine construction projects, was familiar with

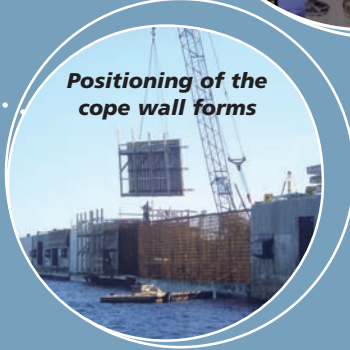




**Ballasted and prepared**



**Project team (l to r): Keith Thompson, Dave Purdue, Dennis Kaufman, Stephen Ouellette and Tracy Eddy**



**Positioning of the cope wall forms**



**Caisson launching from Neptune**

coulombs. This specification presented challenging liquid concrete properties for slip-form applications, as silica fume admixtures proved catastrophic on similar past projects. With the help of local concrete supplier Blanchard Ready-Mix, an ideal slip-form mix was developed using as a model primarily the same mix Blanchard supplied for the 1995 expansion.

Measuring 11m wide by 35m long by 11m high, each unballasted caisson weighed around 3,000 tonnes and had 20 interior cells. They were constructed individually on the semi-submersible barge *Neptune* to a height of 4.75m, then launched from the barge – slip-forming continued while they were afloat until the full height of 11m was reached. Each caisson was then carefully manoeuvred into position using RTK survey equipment and sunk on to its mattress foundation.

On average, the process of slip-forming, launching, towing, sinking and placing the permanent ballast material could be completed on a one-week-per-caisson schedule. It was critical that caisson construction and installation – although somewhat independent of other port works – be conducted in accordance with the same work schedule to ensure that no delays would affect the overall project schedule. As anticipated at the onset of slip-forming in mid-July, the last caisson touched down into position in mid-November.

the port, having completed a previous expansion in 1995.

Once the project was under way, McNally's scope of work was expanded through a contract variance to include dredging of 200,000m<sup>3</sup> of soft sediment within the inner harbour basin and the outer harbour entrance channel – increasing the contract value to just under C\$30M.

**DEADLINES**

Given the government's goal of rapid economic stimulus, all projects receiving ISF funding have to be completed by 31 March 2011. And to ensure contractor compliance, BPA included liquidated damages penalty clauses within the contract, with daily financial penalties to be paid by the contractor for any and all works that are not completed by 28 February 2011.

Not surprisingly, project mobilisation started immediately after the contract was awarded! The company certainly didn't underestimate the challenge it faced in completing what would typically be considered a two-season project because of the area's harsh winter weather conditions.

By early June, the initial phase of construction was under way, including clamshell dredging by the *William B. Dilly* of about 40,000m<sup>3</sup> of soft sediments from the future caissons' footprint so that bearing capacities

could be increased by construction of rock mattresses founded directly on the bedrock. Because of the environmentally sensitive nature of the works and the existence of active fishery stakeholders sharing an interest in the region, the entire harbour was isolated behind a 200m-long turbidity curtain that essentially acted as a gate at the harbour entrance, preventing solids brought into suspension from exiting the port.

Following closely behind the dredger was a second crew working aboard the mattress barge. Approximately 30,000 tonnes of locally quarried crushed rock mattress material were placed and graded with exacting precision to ensure that positioning of the caissons adhered to the allowable positioning tolerances (+/-75mm in all directions) set out in the contract documents.

Both dredging and mattress works continued simultaneously on a gruelling 24/7 schedule over the course of several months in order to maintain compliance with the strict schedule. Material dredged from both the caisson mattress locations and the inner harbour basin and entrance channel areas was transported ashore in barges and trucked to onshore confined disposal facilities that will later be capped with rock in readiness for further expansion of the port's laydown area.

**HEAVY BRIGADE**

As the dredging and the mattress construction continued, a third crew began the marathon task of slip-forming the nearly 20,000m<sup>3</sup> of high-performance reinforced concrete necessary to construct the 14 caissons.

The concrete specified had a compressive strength of 35MPa and an ion permeability of not more than 1,500

**FINALLY...**

Overall, Belledune has proved to be a challenging project and the team responsible has shown dedication and worked exceedingly long hours to make it happen. Led by BPA's engineering director Tracy Eddy, members include myself (*Stephen Ouellette is McNally's project manager*), McNally's general superintendent Dennis Kaufman, Eastern Design Engineers' Keith Thompson and Gemtec's project manager Dave Purdue.

As I write, with winter closing in on northern New Brunswick, only cope wall construction, fender and bollard installation – plus the entrance channel dredging – remain to be completed. McNally's confident that the looming February completion deadlines will be met and the new and expanded port facilities will provide the infrastructure necessary for the BPA to achieve its goal of becoming a bigger player in global logistics, including positioning itself as a gateway to the Canadian Arctic and Newfoundland.

*More info at [www.portofbelledune.ca](http://www.portofbelledune.ca) + [www.mcnallycorp.com](http://www.mcnallycorp.com)*