



# Port Saint John Westside Modernization Project

Hatch Ltd and Dillon Consulting Ltd.

Canadian Consulting **Awards** 2023 - Transportation

**HATCH**

## Project Summary

Port Saint John proactively undertook the Westside Modernization Project to expand its container terminal and intermodal capacity. The Port engaged Hatch/Dillon to develop scalable infrastructure while maintaining port operations in some of the highest tides in the world. Hatch/Dillon's technical expertise combined with mindfulness for social impacts drove the Project and its successes. The Project has had lasting positive impacts on New Brunswick's economy and Port Saint John has become North America's fastest-growing container terminal.



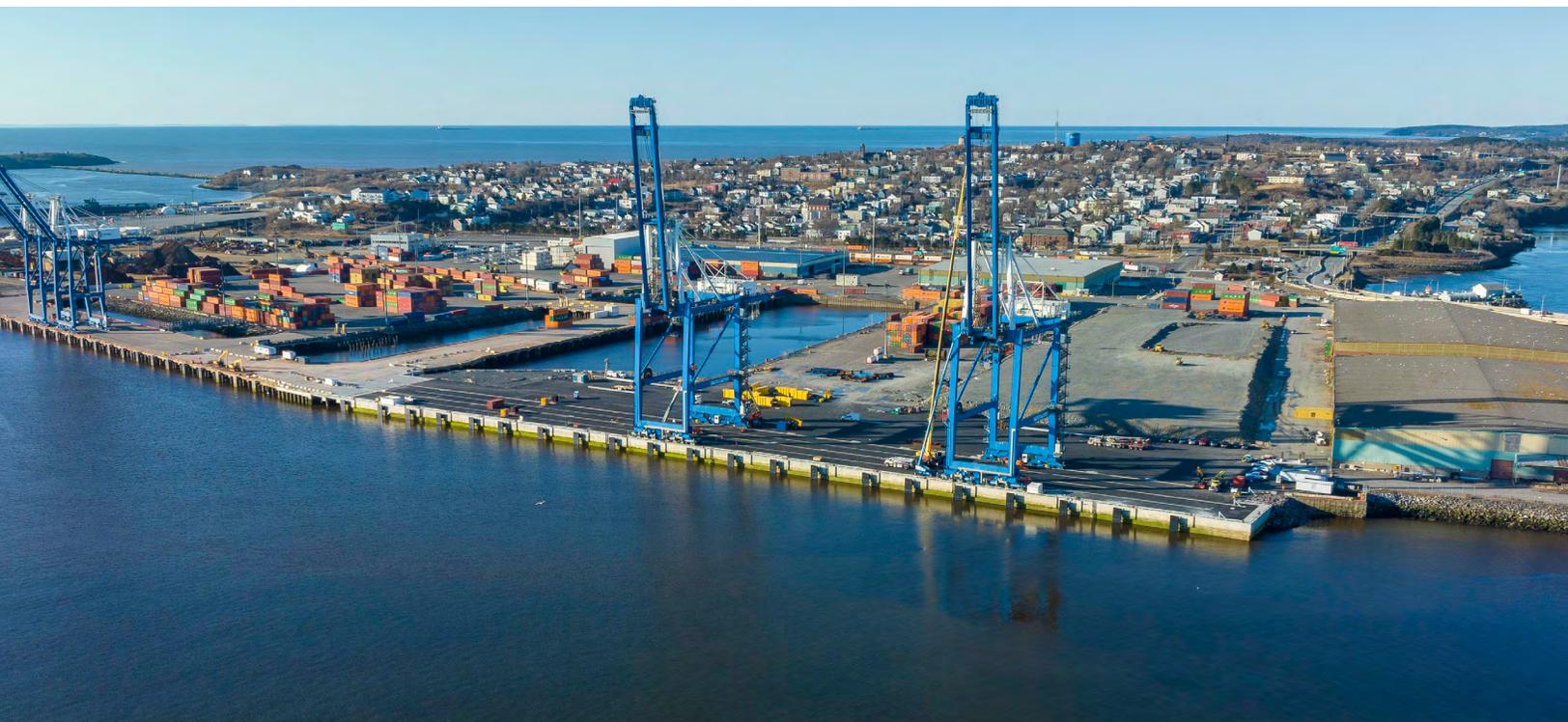
# Project Highlights

## Innovation

The objective of the Project was to modernize the container terminal at Port Saint John while increasing the capacity of the terminal to 650,000 20-foot equivalent units (TEUs). A second berth was built to accommodate bigger and deeper vessels, and the intermodal yard, truck gate, and container terminal were upgraded to facilitate growth for the entire operation. Hatch/Dillon designed innovative infrastructure to accommodate high capacities for years to come, which led to Port Saint John becoming the fastest-growing container terminal in North America. Project-specific innovations include extra-tall and environmentally-appropriate caissons, scalable rail yard, and accommodating crane track.

The Westside Modernization Project was unique among port projects because of the size and complexity of building caissons on the site. Major technical innovations included:

- Design and construction of eight 27-metre-high concrete caissons, believed to be the tallest, backfilled caissons in North America, to create a second container vessel berth for the facility.
- Design of a combination wall reinforcement for the existing wharf to allow for dredging for the caisson mattress adjacent the existing piled structure.
- Design of a piled wharf to connect the new berth (caissons) to the existing berth.
- Design and management of multiple dredging contracts that would ensure a deeper and more accessible main channel as well as preparing the foundations for the caissons.





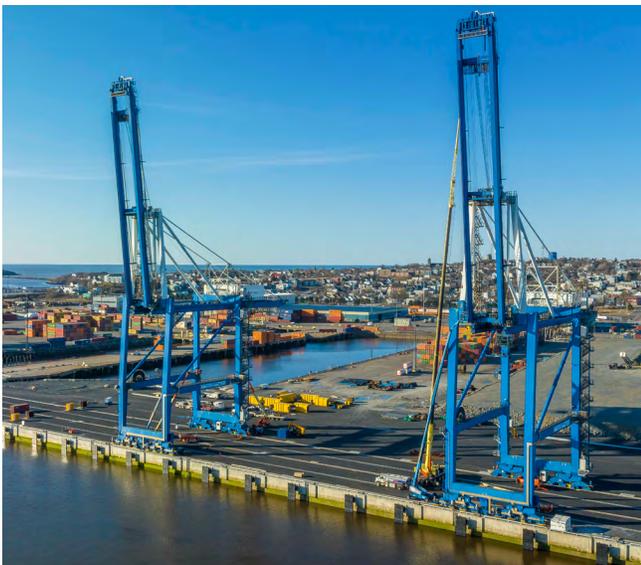
Hatch/Dillon considered the long-term outlook for the Project and designed adaptable infrastructure, including:

- Design of a new 9,000-foot intermodal rail yard that is scalable to meet future growth. Track spacing was chosen to accommodate reachstackers while being able to transition to rubber tired gantries in the future.
- A modernized truck gate for the terminal that would be fully automated facilitating truck throughput.

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Another unique requirement was two existing cranes that operated on the Rodney Marginal berth needed to be able to travel onto the new berth, which due to alignment constraints necessitated curved track. The new berth had to simultaneously accommodate new 100-foot gauge cranes and existing 50-foot gauge cranes, which is not a common requirement for modern container berths.



## Complexity

The tides, which range more than 8 metres, presented major design and operational challenges for the construction of a container berth at Port St. John. Further, the Port needed to be able to accommodate post-Panamax-sized vessels. In response, Hatch/Dillon designed caissons that were 27 metres in height. Caissons this size had never been constructed in Eastern Canada before. Due to their size, a temporary mattress was constructed adjacent to the pier so that the caissons could touch down at low tide during the slip forming process. All eight caissons were completed in one construction season and stored within the Port's slip until the mattress was ready for caisson placement. Building caissons of this size provided the added benefit of reducing dredging quantities.

A major unforeseen challenge was managing the Project through a pandemic. Covid-19 restrictions limiting travel and in-person work were imposed during the first days of caisson construction. The first two work packages were won by out-of-province contractors; therefore, more trailers and meeting rooms were needed to accommodate social distancing, and more cleaning staff were required. The Project involved 16 tenders that ranged in price from \$250K to \$80M and were affected by restrictions and shortages due to Covid-19. Hatch/Dillon maintained transparent communication with the client about supply chain issues in procuring material and was able to work collaboratively to troubleshoot transport routes and financing, thereby keeping the Project on schedule.

## Social and/or Economic Benefits

Port Saint John secured provincial and federal investments for the Project and undertook numerous studies on the social and economic impacts and benefits to the surrounding region. When the Project was 50% complete, both the Province of New Brunswick and the Port realized that the economic growth was happening much more rapidly than expected. In 2021, the Province decided to get in front of the growth to ensure the region was well-prepared for the finished Project. By that time, the Port had already had to hire operators for new reachstackers and cranes, so the Province partnered with employers, labour representatives, and others to maximize employment and economic development opportunities.

Hatch/Dillon also found opportunities for social benefits by assisting with the Project’s consultation efforts with local First Nations. The consultation process included several innovative approaches to engaging the communities by outlining the development of capacity agreements in support of continued relationship-building between the Port Authority and the Nations throughout Project construction and beyond.

The primary objectives of the workforce partnership committee were to:

- Develop and refine a workforce partnership model that targets and accelerates strategic workforce recruitment.
- Develop and implement a recruitment and training strategy that supports and aligns with the needs of potential employers associated with the Port of Saint John.

## Direct economic contribution of the Port of Saint John Project:

	 Output	 GDP	 Labour Income	 Jobs (FTEs)	 Taxes
<b>New Brunswick Level</b>					
<b>Terminal Expansion</b> Total Construction Investment 2021-2023	\$42.0M	\$19.1M	\$15.2M	304	\$1.6M
<b>Terminal Equipment Upgrades</b> Total Equipment Investment 2023 and onwards	\$108.0M	\$51.5M	\$39.1M	646	\$3.4M
<b>Terminal Operations</b> Annual Operations (Steady state)	\$264.8M	\$106.5M	\$106.5M	813	\$9.2M

## Environmental Benefits

The harbour bottom had significant underlying soft soil and clay that needed to be dredged for the placement of a rock mattress to support the gravity-based caissons. Hatch/Dillon saw the challenge of dredging 600,000 m<sup>3</sup> of soft soils as an opportunity for the Project to reuse the soils as land reclamation. This proved to be a very cost-efficient and environmentally-friendly means of increasing the size of the Port's container terminal. The Project was designed and tendered so that the dredge soils could be placed in the slips behind the new wharf. This reuse of material created several acres of land, mitigated environmental disruption outside of the Project footprint, and saved costs.



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The environmental permitting process began in 2018 and Hatch/Dillon supported the Port and other federal authorities by consulting with the Wolastoqey, Mi'kmaq, and Peskotomuhkati Nations of New Brunswick. The consultation process assisted federal authorities to meet their Duty to Consult with First Nations as part of the required Environmental Effects Evaluation (EEE) and the Fisheries Act Authorization. Hatch/Dillon worked closely with nearby Indigenous communities to identify and advance various fish passage improvement opportunities aimed at offsetting the residual effects of the Project on fish and fish habitat, as required by the Fisheries Act Authorization. Finally, Hatch/Dillon worked closely with Wolastoqey Nation in New Brunswick (WNNB) to collect baseline environmental data for the offsetting opportunities and conducted follow-up and monitoring activities.

## Meeting Client's Needs

The Project required significant lead time (2012-2019) to conceptualize, secure funding, confirm feasibility, and gain stakeholder buy in. Hatch/Dillon was involved from the beginning: Hatch completed pre-feasibility studies to determine what infrastructure the Port would need to increase capacity. The study identified necessary improvements to the berth, container yard, and intermodal yard. After the Port secured funding, Hatch/Dillon responded to the request for proposal and won the contract. Hatch/Dillon, which had prepared an appropriate budget almost a decade earlier when feasibility studies had taken place, had a clear understanding of the Project and the client's goals before design work began. Hatch/Dillon divided the work into 16 packages. The smaller work packages enabled more local

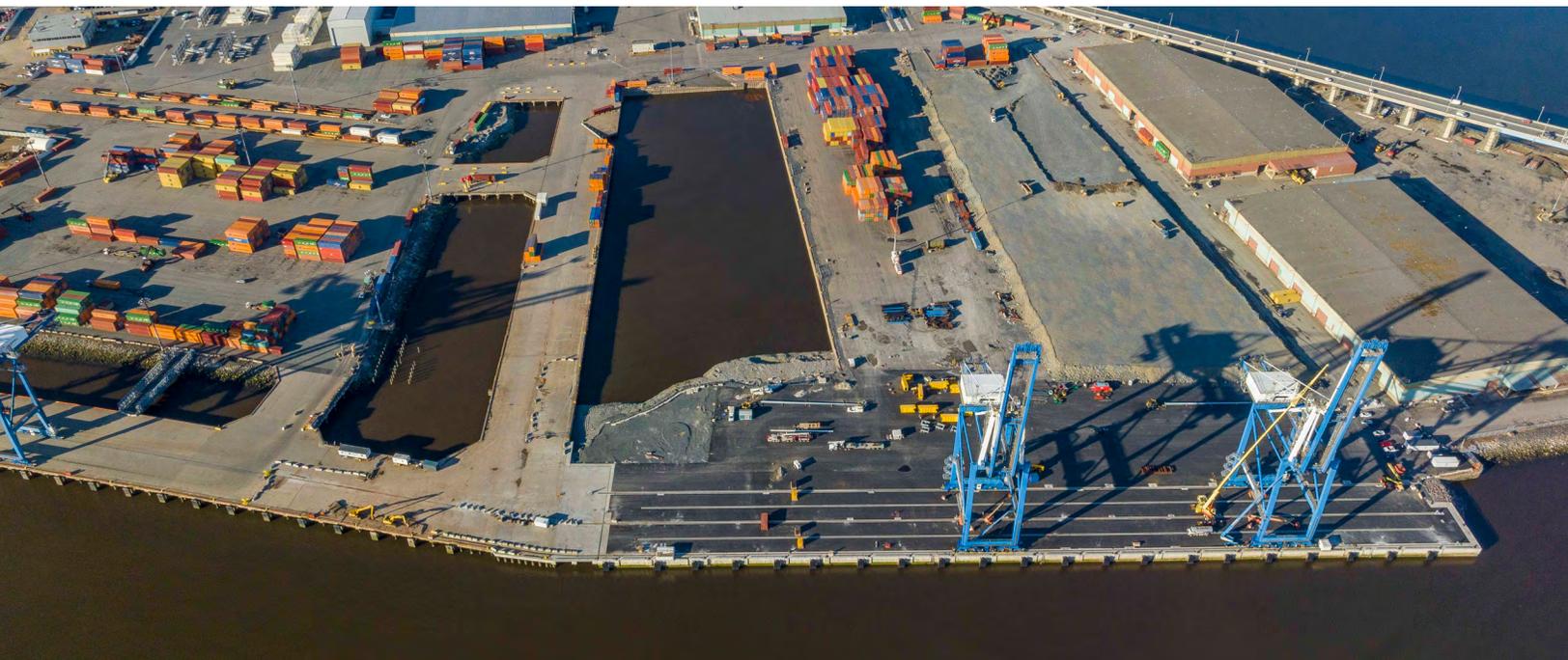
participation and competition, thereby meeting the client's goal of completing the project quickly and on-budget.

The client, Hatch/Dillon, and the container terminal operator all shared their understandings of the Project goals throughout the design and construction process to create a working partnership. The Project was built to meet the needs of DP World, the container terminal operator. All major design decisions required significant collaboration with DP World to ensure we were meeting their operational requirements while building in capacity to meet their future growth needs. This unique collaborative approach with the client (Port Saint John) and the end user (DP World) resulted in a highly functional design and Project and allowed the container terminal to function while the construction was ongoing.

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*Watch the Port of Saint John construction video: <https://hatch.wistia.com/medias/4l3mk7n08d>*

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## Photo Appendix



*Caisson Construction Area*

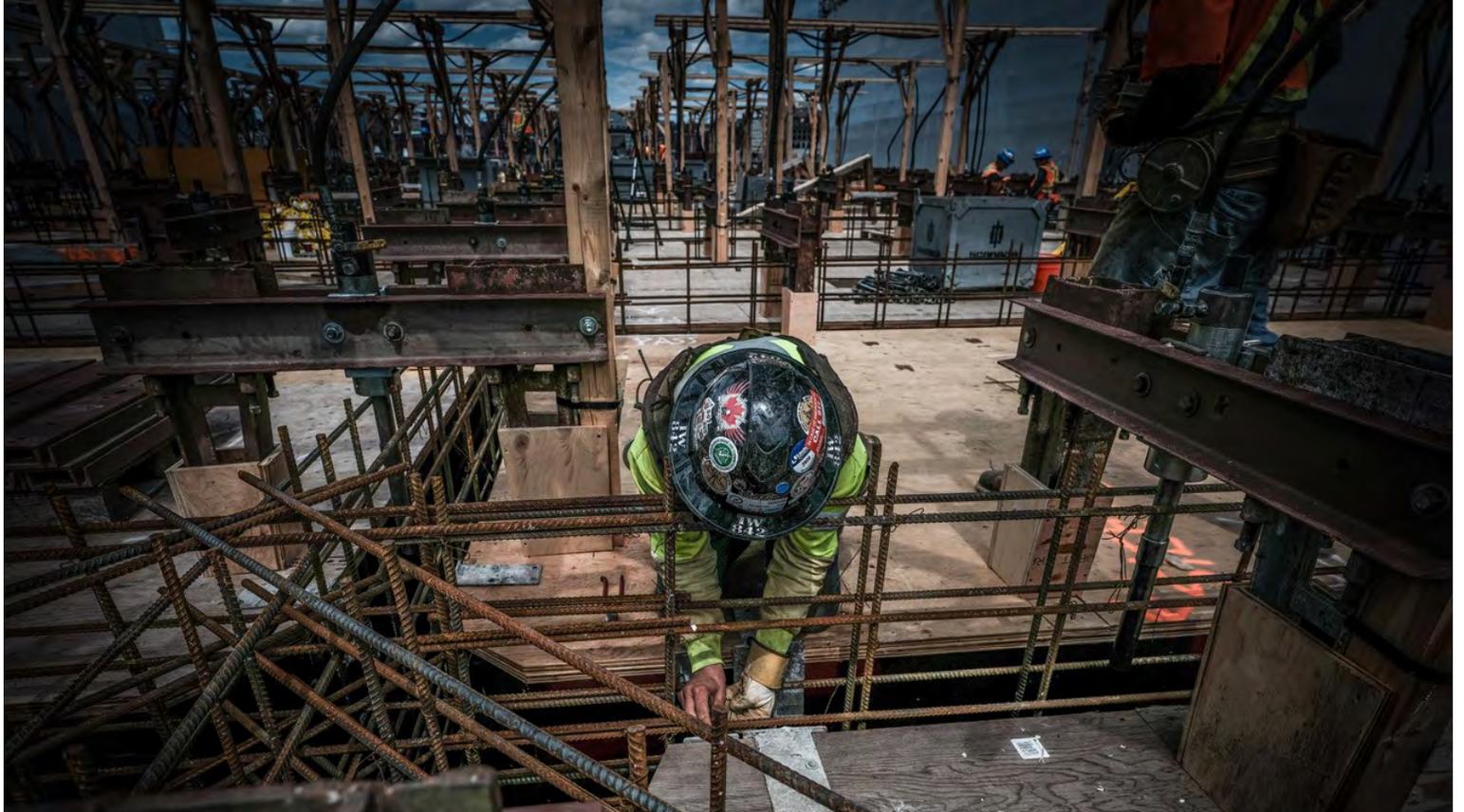


*Caisson Construction Pier*



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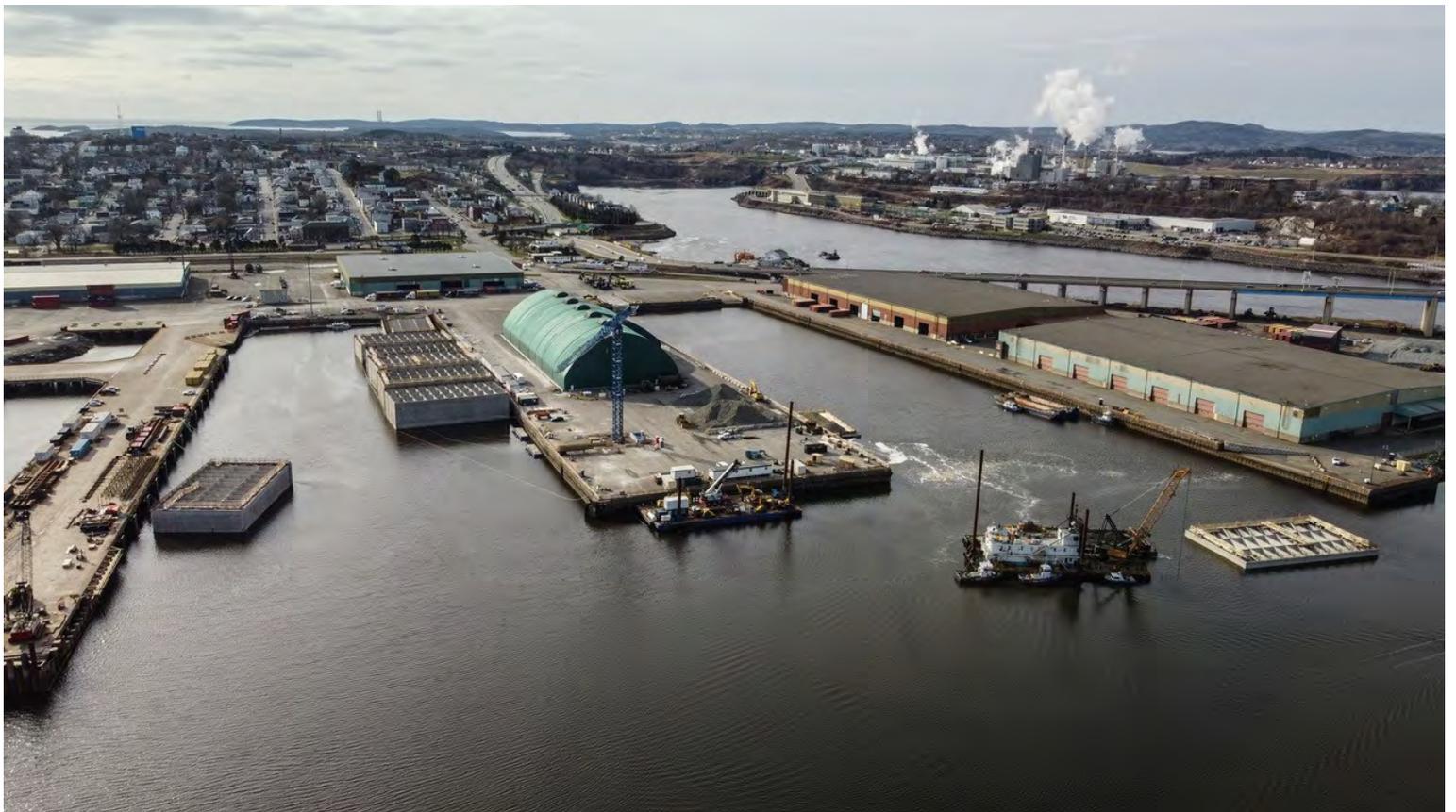
*Caissons Start On Barge*



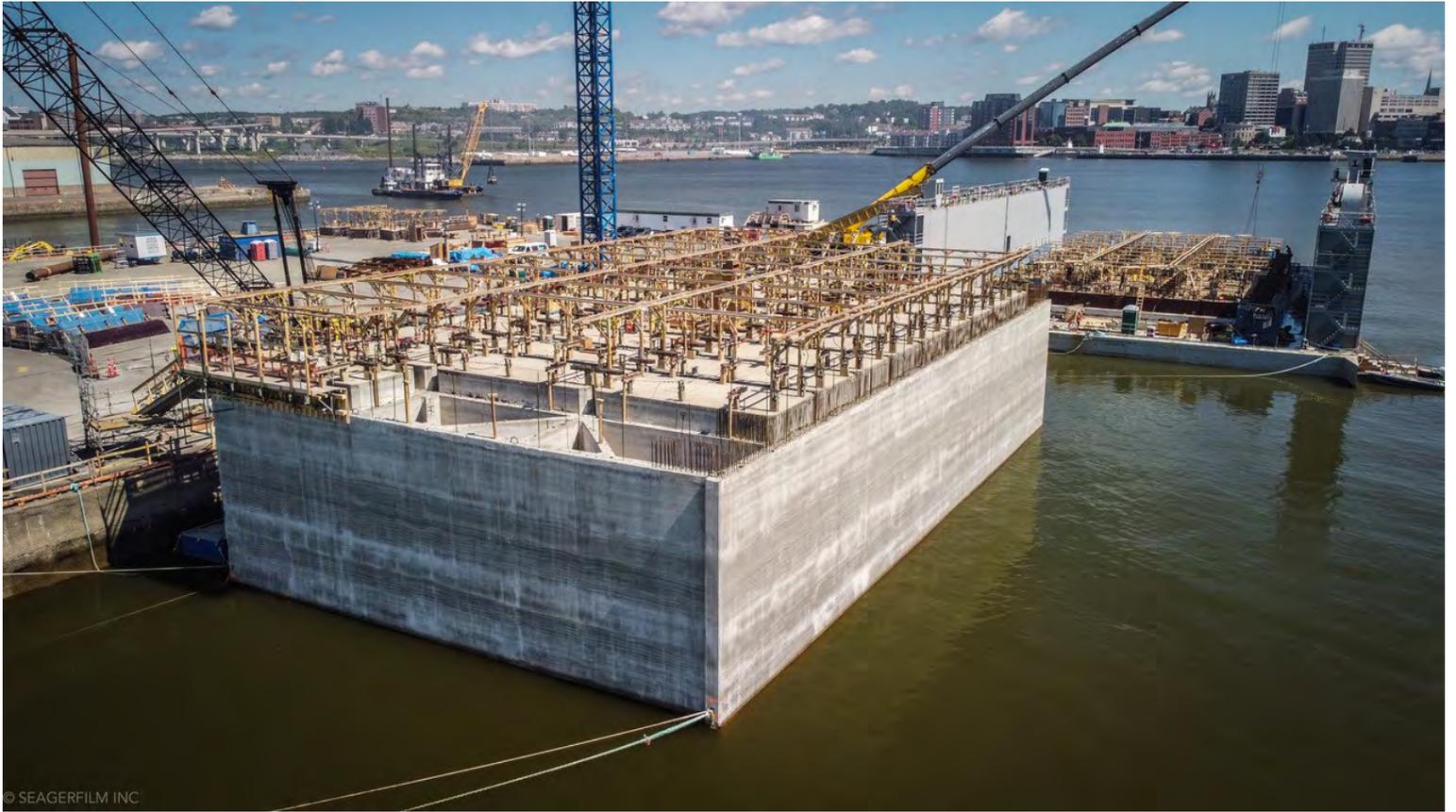
*Caisson Rebar*



*Caisson Storage*



*Berth Construction*



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*First Caisson Complete*



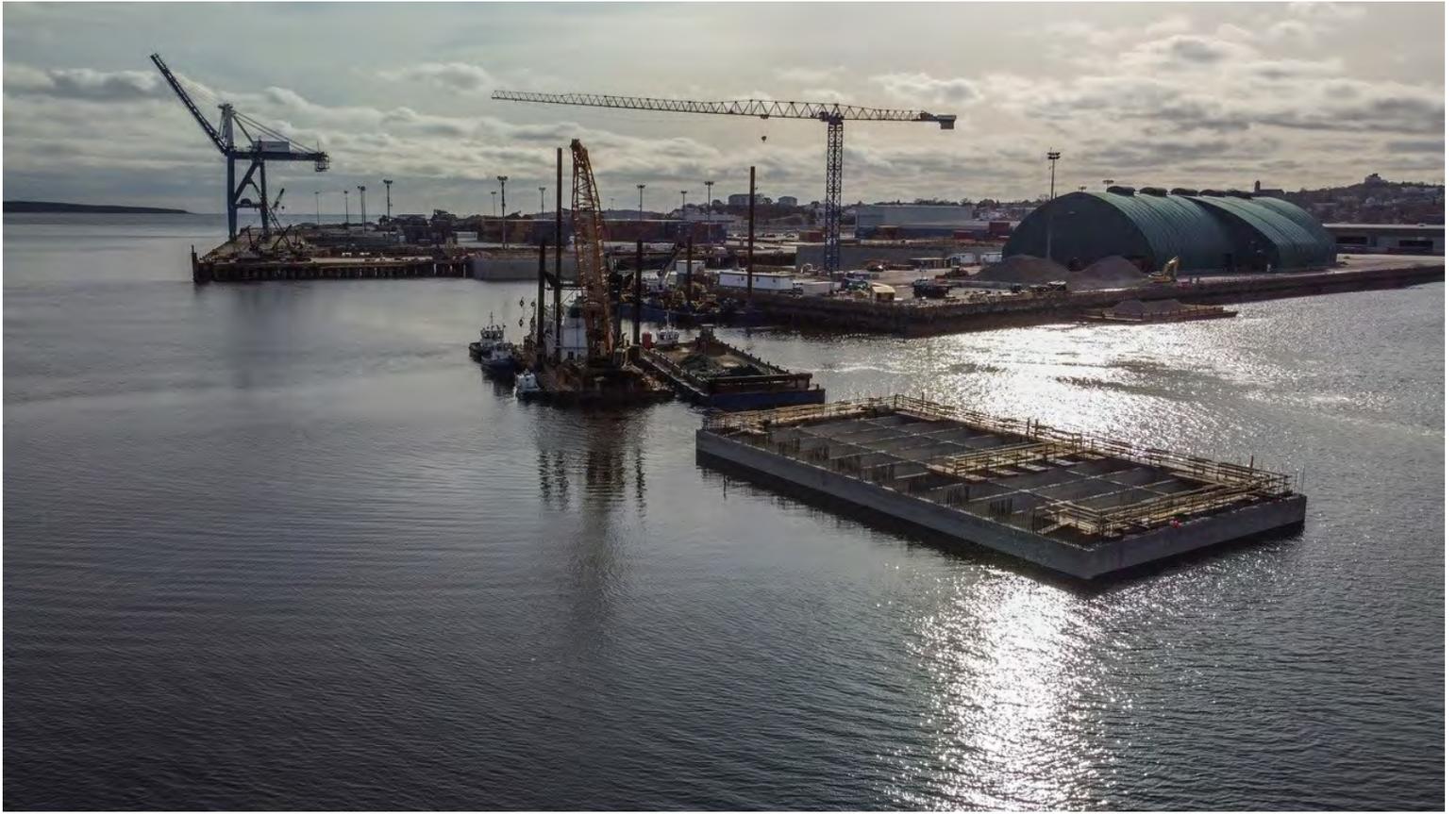
*First Caisson Being Placed*



*First Caisson Being Placed*



*First Caisson In Place*



*Building Mattress For Caisson*



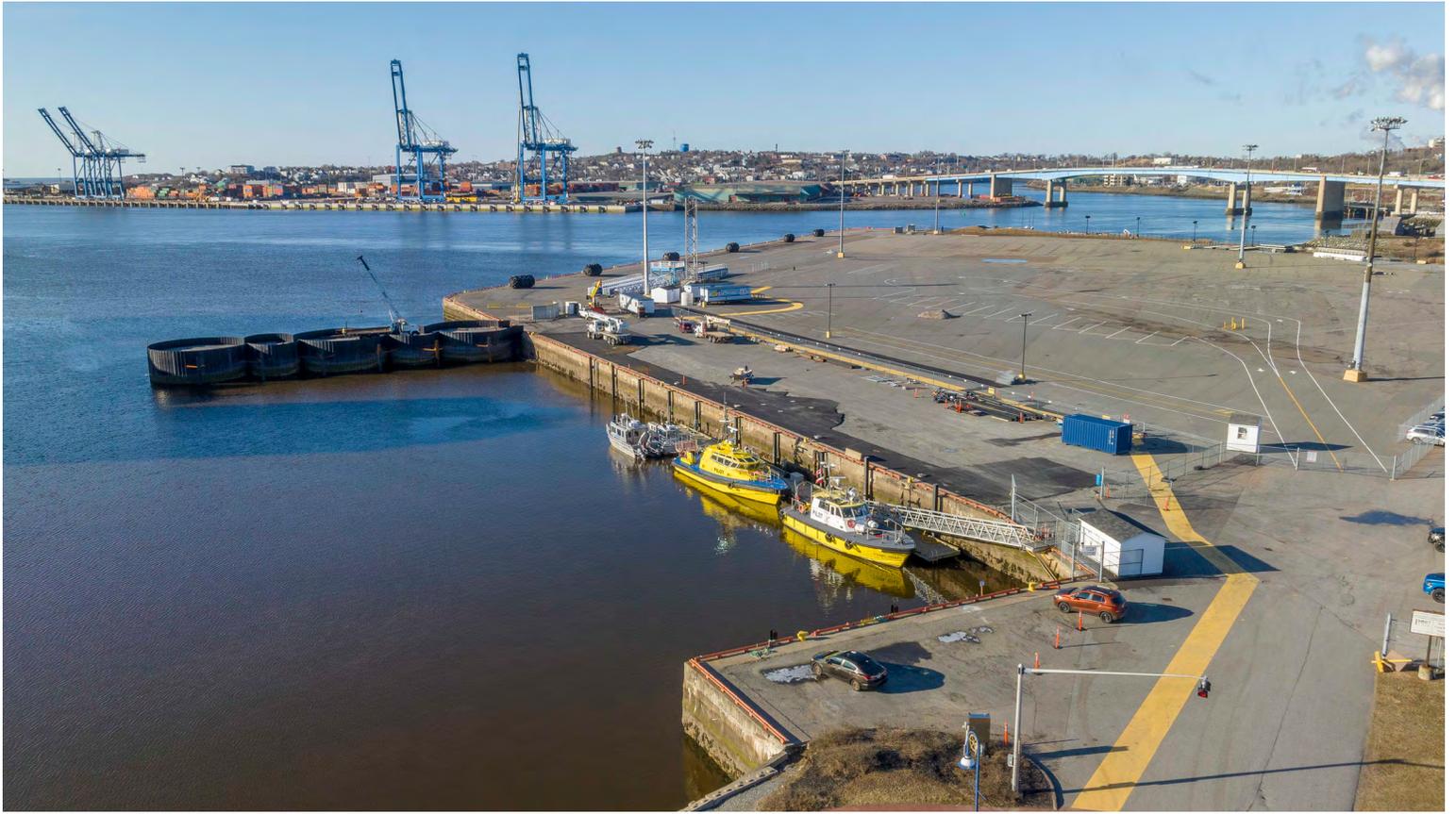
*Intermodal Yard*



*Intermodal Yard*



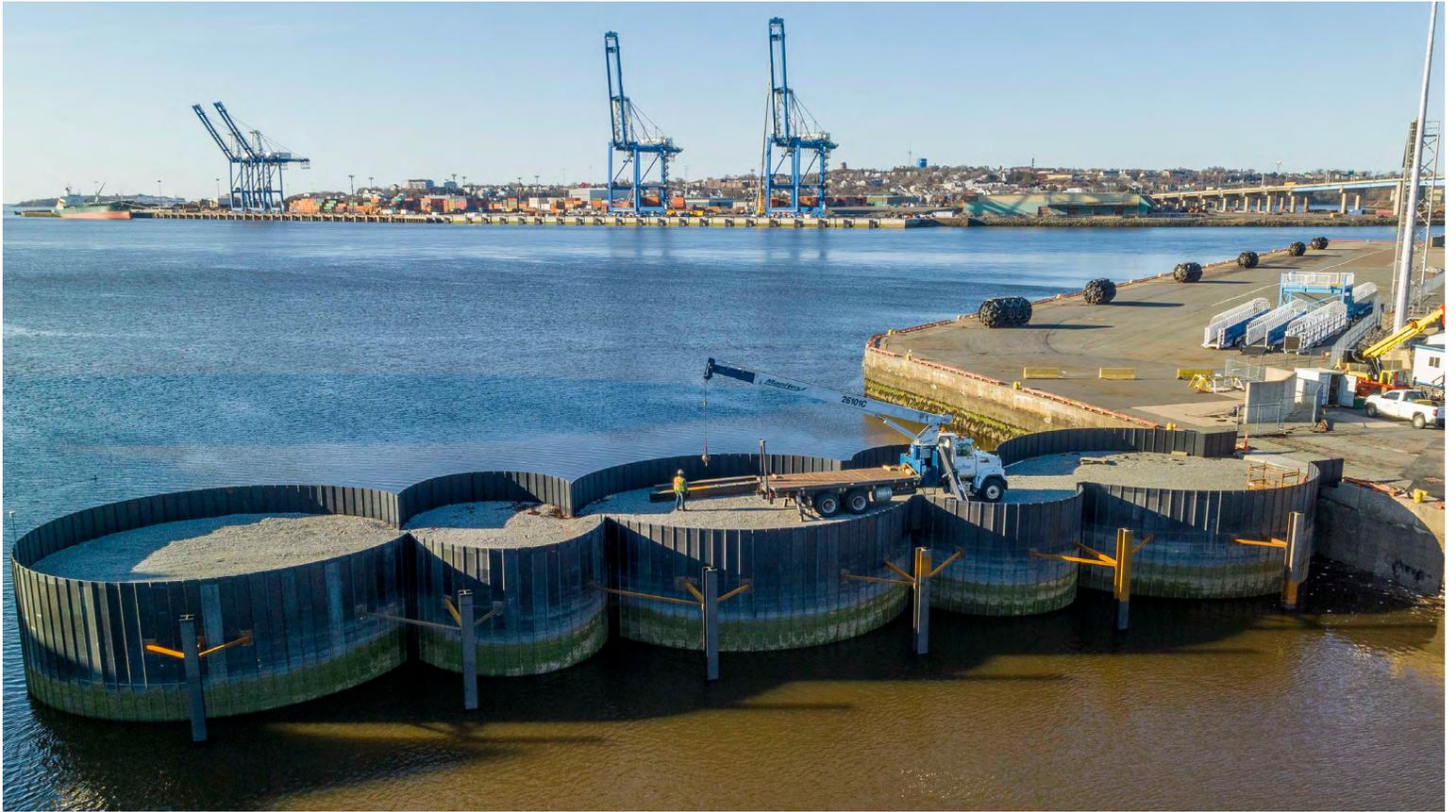
*Long Wharf Landing*



*Long Wharf Landing*



*Long Wharf Landing Breakwater*

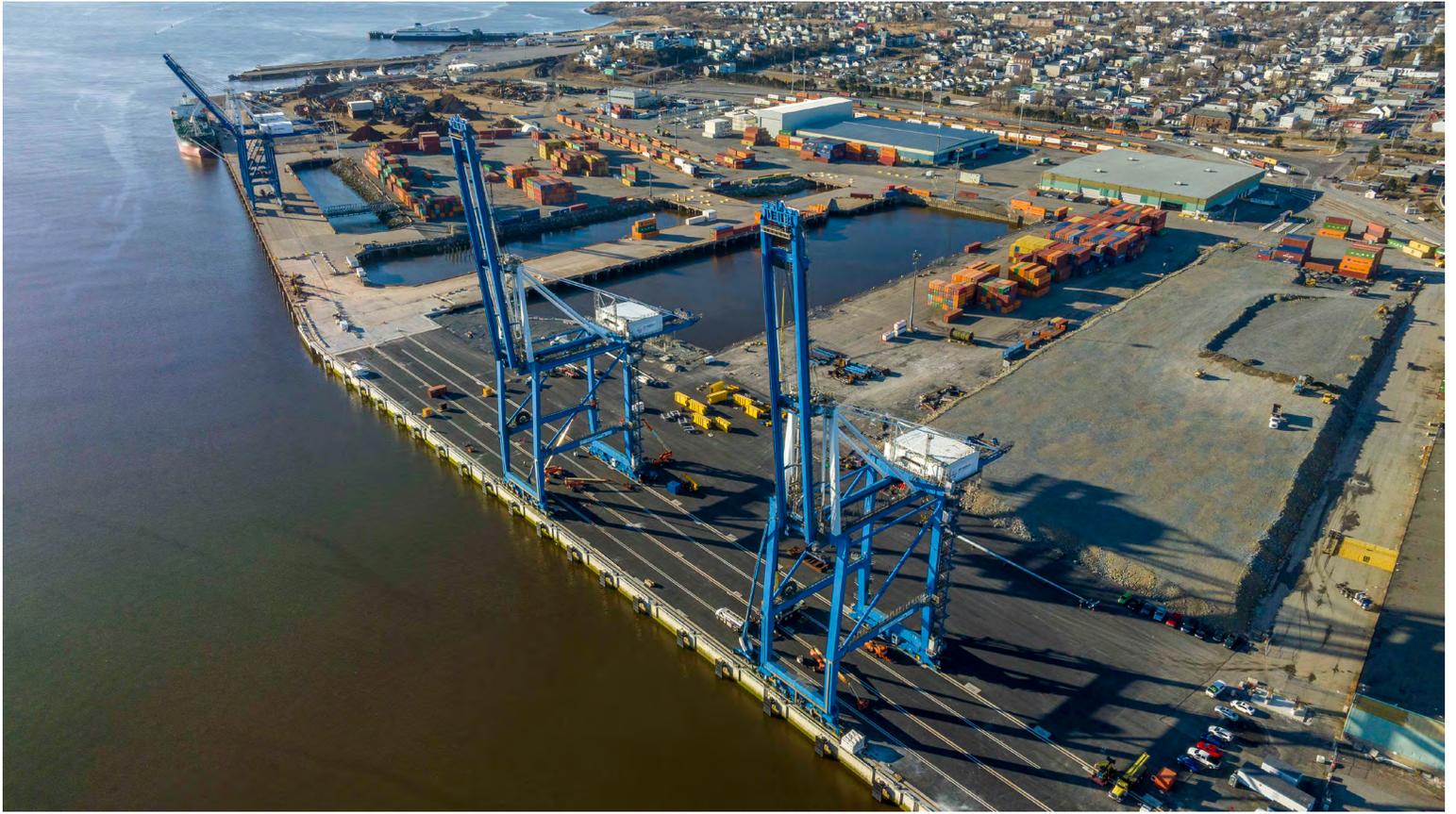


*Long Wharf Landing Breakwater*



*Westside Overview*

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*Westside Overview*



*Westside Modernization*



*Westside Modernization*



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