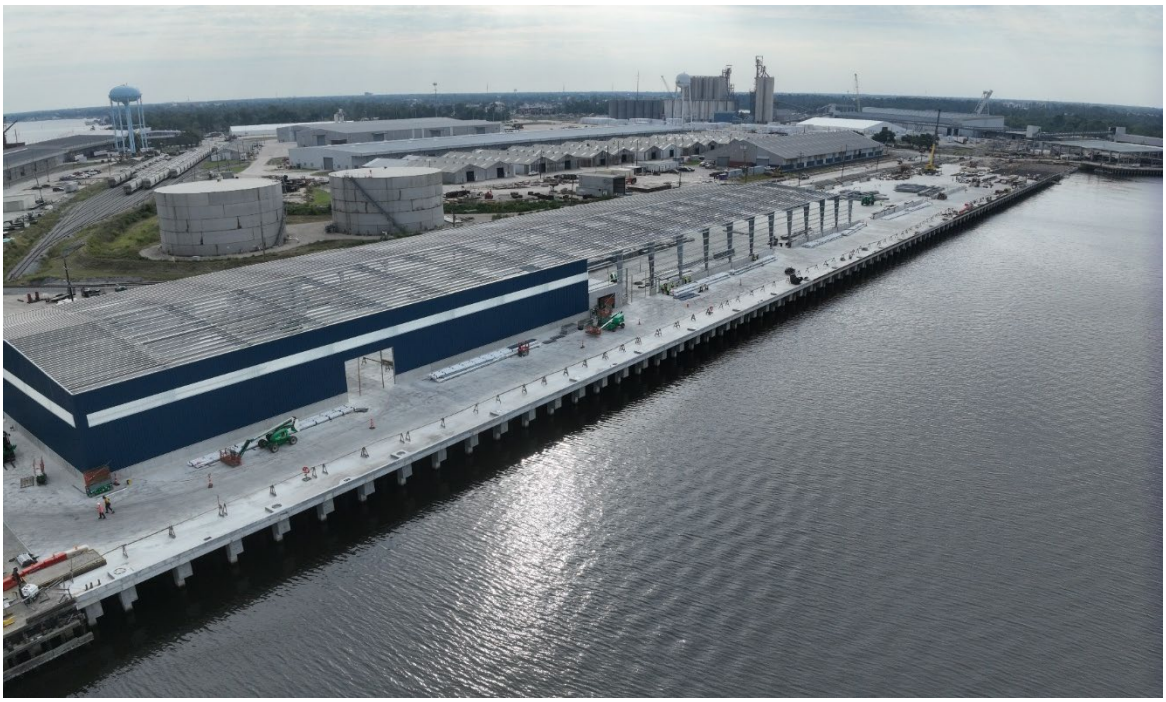
PORT OF LAKE CHARLES EST. 1926

Berths 4, 5, and 6 Wharf and Shed Reconstruction Project



AAPA Lighthouse Awards Application
Excellence in Facility & Infrastructure Development
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Excellence in Construction Practices

Submitted by: Lake Charles Harbor & Terminal District

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1. Background, Purpose & Goals

Facility Background and Project Purpose

The Port of Lake Charles' Berths 4, 5, and 6 Wharf and Shed Reconstruction Project modernizes one of the Port's most critical cargo-handling facilities at the City Docks Terminal. Originally constructed in 1929, the facility consisted of approximately 256,000 square feet of transit sheds supported by timber piles and a concrete wharf deck. For decades, the complex served as a vital hub for breakbulk and liquid bulk cargoes, including agricultural products, forest products, steel, rubber, specialty minerals, project cargo, and wind energy components.

Over time, aging infrastructure and operational constraints limited the facility's ability to support modern cargo operations. Deteriorating structural components, limited floor load capacities, low eave heights, and restricted cargo-handling areas reduced efficiency and hindered the Port's ability to accommodate larger equipment, evolving cargo demands, and contemporary vessel requirements.

These challenges were compounded by Hurricane Laura in 2020, which caused extensive damage to the transit sheds, rail loading canopy, roofing systems, and other critical infrastructure. Following the storm, Transit Sheds 4, 5, and 6 became unusable, forcing cargo operations to be dispersed throughout the terminal. This fragmentation increased cargo handling times, reduced operational efficiency, and created additional costs for Port customers.

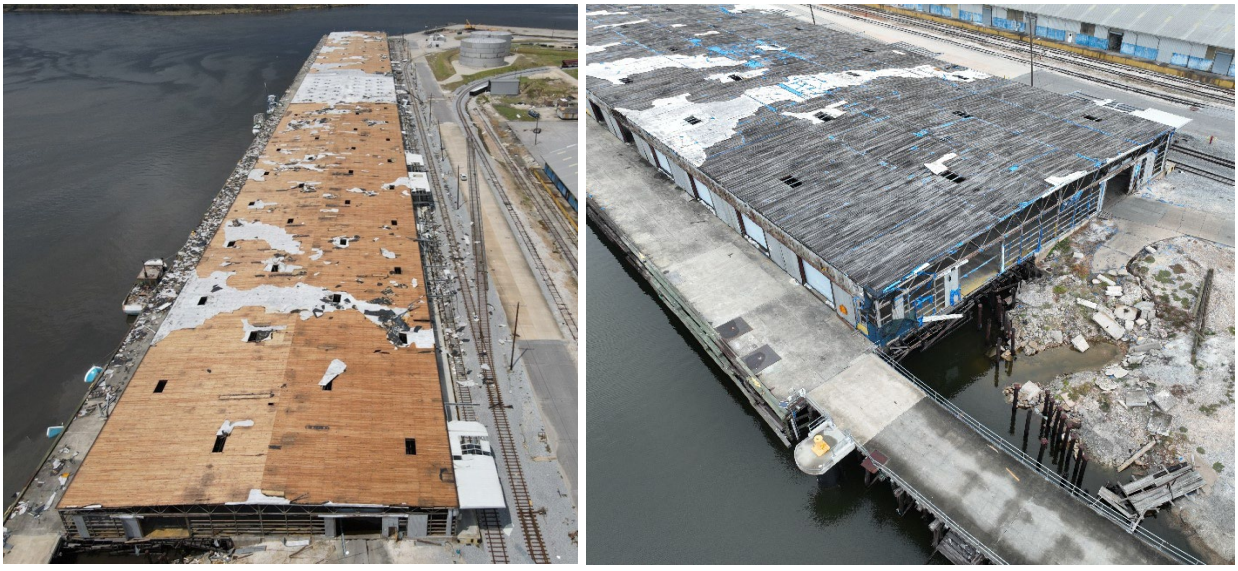


Figure 1 Transit Sheds 4, 5, and 6 Post Hurricane Laura

To restore this critical asset and position the Port for future growth, the Port of Lake Charles initiated a comprehensive reconstruction program that includes a new steel bulkhead, pile-supported reinforced concrete wharf, upgraded fender and mooring systems, a modern clear-

span transit shed, rail and truck loading facilities, utility improvements, enhanced drainage, security, and fire protection systems.

The reconstructed facility will significantly improve cargo-handling efficiency through expanded apron areas, increased floor load capacities, higher cargo stacking capability, and unobstructed interior storage space. These improvements will restore critical cargo capacity, strengthen supply-chain resiliency, support future cargo growth, and enhance the Port's long-term competitiveness.

Recognizing the size, complexity, and operational importance of the project, the Port selected the Construction Manager at Risk (CMAR) delivery method. This approach enabled the Port, designer, and construction manager to collaborate throughout the design process, providing early input on constructability, sequencing, cost estimating, procurement strategies, and risk management. The CMAR delivery method continued to provide value throughout design and construction by facilitating collaboration, schedule management, and risk mitigation.

Goals and Objectives

The project established several measurable goals and objectives:

1. Deliver the project safely while maintaining active adjacent port operations.
2. Complete construction efficiently through effective schedule and budget management.
3. Incorporate resilient engineering and construction practices to extend infrastructure service life.
4. Improve cargo throughput efficiency and operational reliability.
5. Reduce future maintenance requirements and operational downtime.
6. Coordinate effectively with tenants, marine operators, contractors, and stakeholders.
7. Strengthen the Port’s long-term economic competitiveness and supply chain capabilities.

The project reflects the Port’s commitment to infrastructure stewardship, operational excellence, and strategic investment in maritime commerce.

2. Implementation & Resources

Planning and Project Development

For many years, the Port evaluated alternatives for replacing the Berths 4, 5, and 6 complex, but the project's size and complexity delayed implementation. Following Hurricane Laura, the damaged facilities could no longer safely support cargo operations, creating an urgent need for reconstruction. Subsequent damage assessments, infrastructure evaluations, operational reviews, and engineering analyses confirmed significant structural deterioration and operational limitations. Planning efforts included coordination among engineering consultants, marine operations personnel, tenants, and regulatory agencies to establish project priorities and implementation strategies.

The project initially began under a traditional Design-Bid-Build approach with the selection of a design engineer and development of a preliminary project scope. As planning progressed, the Port determined that the project's size, complexity, and operational constraints would benefit from greater collaboration during design and preconstruction. As a result, the delivery method was transitioned to CMAR, allowing the construction manager to participate during design by providing constructability reviews, cost estimating, procurement planning, risk assessments, and sequencing recommendations. This collaborative process helped identify challenges early, evaluate alternatives, and support informed project decision-making throughout design and construction.

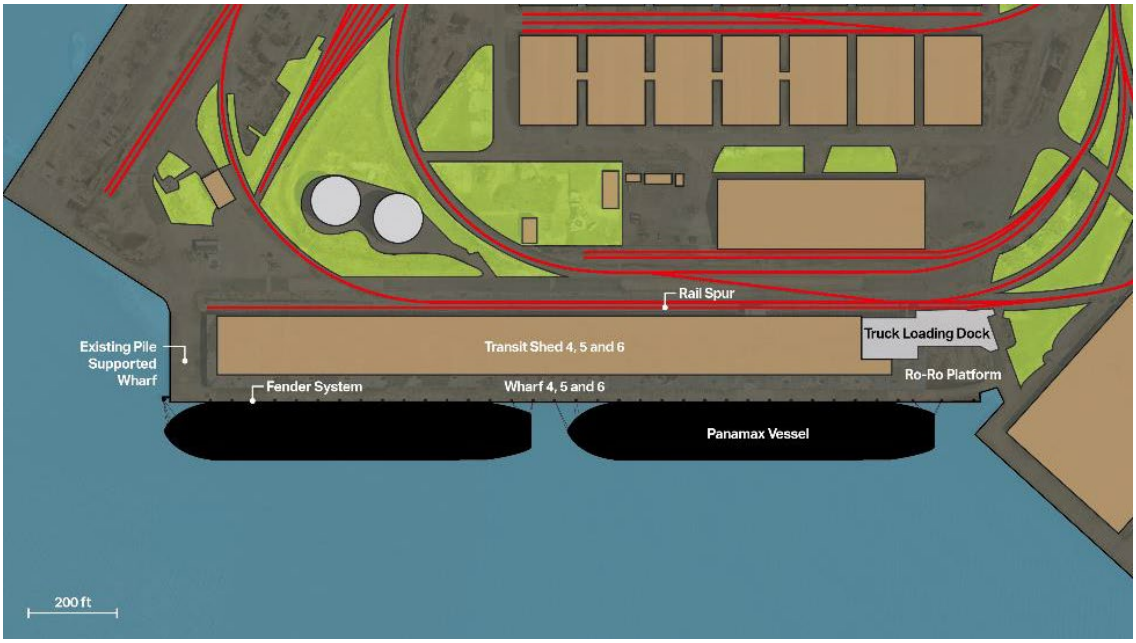


Figure 2 Berths 4, 5, and 6 Complex

The project involved the complete reconstruction and modernization of the Berths 4, 5, and 6 complex, including the demolition of deteriorated wharf infrastructure and construction of new pile-supported concrete wharf structures and clear-span transit sheds. Additional improvements included modern fender and mooring systems, upgraded utilities and operational support infrastructure, and site enhancements that improve cargo handling efficiency, operational access, and long-term facility performance.

Resources and Funding

The Project leveraged a strategic combination of financial, technical, and operational resources to successfully deliver one of the Port of Lake Charles' most significant infrastructure investments. Recognizing the importance of restoring critical cargo handling capacity following Hurricane Laura, the Port assembled a diversified funding package that combined local, state, and federal resources to accomplish the largest capital project the Port has ever undertaken in it’s 100-year history.

Financial support for the project included a substantial capital investment and matching funds commitment from the Port of Lake Charles, supplemented by $96 million in funding through the Louisiana Capital Outlay Program and $15 million from the Louisiana Department of Transportation and Development's Port Construction and Development Priority Program. In addition, the Port pursued FEMA disaster recovery funding associated with hurricane-related damages to the existing facilities. Through this collaborative funding approach, the Port committed more than $37 million in direct project funding while leveraging additional state and federal investments to advance the complete modernization of the Berths 4, 5, and 6 complex at a total cost of $148 million dollars.

The project's success was equally dependent upon the expertise and collaboration of a multidisciplinary team. Port leadership and engineering staff worked closely with marine engineering consultant Moffat & Nichol, CMAR contractor Cajun Industries, LLC, and specialty subcontractors throughout planning, design, and construction. Environmental and regulatory compliance specialists helped navigate permitting and resilience requirements, while operations and maintenance personnel ensured that project decisions aligned with the long-term operational needs of the terminal. This integrated team approach, combined with the CMAR delivery method, fostered early risk identification, collaborative problem solving, and efficient project execution while minimizing impacts to ongoing Port operations.

Efficiency Measures and Value Engineering

The project team placed a strong emphasis on efficiency, constructability, and long-term value throughout planning and design. Through the collaborative project delivery process, engineers, contractors, and Port staff evaluated alternatives, identified project risks, and optimized both design and construction sequencing.

A comprehensive geotechnical evaluation resulted in the use of multiple foundation systems tailored to varying subsurface conditions across the project site, providing the most effective balance between structural performance and cost efficiency. Durable marine-grade materials were selected to maximize service life and reduce long-term maintenance costs in the harsh Gulf Coast environment. A pile testing program implemented in the preconstruction phase allowed for value engineering and cost savings to occur prior to final pricing, something that is not possible with standard design bid build procurement.

Construction activities were carefully phased to minimize impacts to adjacent operations while maintaining flexibility to address unforeseen conditions associated with aging infrastructure. Utility improvements were integrated into the reconstruction effort, reducing future disruptions and improving overall facility functionality. Combined with modern construction techniques, rigorous quality control, and strategic scheduling around operational and weather constraints, these measures improved project efficiency while supporting long-term infrastructure reliability.

Construction Management and Phasing

Through the CMAR process, the construction manager was engaged during the design phase to provide real-time input regarding sequencing, constructability, procurement planning, operational impacts, cost estimating, and scheduling strategies prior to establishment of the Guaranteed Maximum Price (GMP).

Because the project was constructed within an existing marine terminal surrounded by active operations and aging infrastructure, extensive preconstruction investigations and phased demolition activities were required. Existing timber structures, aging bulkheads, and variable subsurface conditions necessitated ongoing field adjustments while maintaining safety and minimizing operational disruptions. The CMAR process provided the flexibility needed to address unforeseen conditions without compromising schedule or budget objectives.

The project team implemented a carefully coordinated construction strategy that emphasized detailed sequencing, proactive risk management, and continuous communication among stakeholders. Early contractor involvement improved constructability, procurement planning, and schedule development, while regular coordination with Port operations personnel and tenants ensured that construction activities remained aligned with operational priorities. The use of collaborative project management tools, real-time schedule monitoring, comprehensive quality assurance procedures, and strategic procurement planning for long-lead materials further enhanced project execution. Collectively, these efforts improved schedule certainty, reduced operational disruptions, and maintained cargo movement and vessel access to the greatest extent possible throughout construction.

3. Innovation & Relevance

Innovative Planning, Design and Construction Solutions

The Berths 4, 5, and 6 Wharf and Shed Reconstruction Project incorporated innovative engineering, procurement, and construction management practices to address complex maritime infrastructure challenges while maintaining uninterrupted port operations. As previously discussed recognizing the size and complexity of the project, the Port utilized a qualifications-based procurement approach that enabled early collaboration among the Port, design team, contractor, and terminal stakeholders during the design and preconstruction phases.

This collaborative delivery strategy supported proactive risk management, enhanced communication, improved constructability reviews, refined cost estimates, strengthened schedule development, and facilitated procurement planning for critical materials. Early contractor involvement allowed the project team to optimize construction sequencing, coordinate operational constraints within the active marine terminal, and develop cost-effective implementation strategies before construction began. The approach also improved schedule reliability and helped proactively address risks associated with marine construction, operational continuity, and existing infrastructure conditions.

A notable example of the value of this collaboration occurred during the geotechnical evaluation phase. Through coordination among the Port, design team, and contractor, foundation construction was identified as a primary project cost driver. Additional geotechnical borings were performed to better define subsurface conditions and soil boundaries across the site. The resulting data enabled the design team to optimize foundation selection by utilizing five different pile types and lengths tailored to site-specific conditions, generating substantial cost savings while maintaining required performance standards. This data-driven, collaborative process enhanced project efficiency, reduced risk, and maximized value while delivering a resilient and cost-effective marine infrastructure solution.

New Construction with Existing Aging Infrastructure

A significant challenge of the Berths 4, 5, and 6 reconstruction was executing a complete modernization within a nearly century-old marine terminal. The existing wharf and transit sheds were supported by aging timber piles, bulkheads, and underground infrastructure that had evolved through multiple modifications over decades of operation. Construction activities required careful demolition sequencing, extensive field verification, and continuous coordination to protect adjacent berths, active rail infrastructure, underground utilities, and existing tenant operations.



Figure 3 Timber Wharf Demolition

Resilient Marine Infrastructure Design

The project incorporated modern marine engineering standards and resilient design features to improve long-term durability, hurricane resilience, and operational performance within the challenging Gulf Coast environment. The reconstructed facility includes a new steel bulkhead,

drilled displacement piles, precast concrete piles, reinforced concrete wharf, modern fender and mooring systems capable of accommodating larger contemporary vessels, and an on-dock Ro/Ro ramp to enhance cargo-handling flexibility. A new clear-span transit shed with covered multi-bay truck loading docks and a covered rail loading apron significantly improves operational efficiency by increasing usable storage space, eliminating interior columns, and providing greater floor load capacity for modern cargoes and equipment.

Additional resiliency measures include hurricane-resistant building systems designed to withstand winds consistent with a Category 4 storm and infrastructure elevations that account for projected sea-level rise. The reconstructed wharf and deck systems primarily utilize reinforced concrete construction, representing approximately 80 percent of the project materials, with local and regional sourcing incorporated where feasible to maximize long-term value and regional economic benefit.

Operational Continuity During Construction

Maintaining cargo operations during reconstruction was one of the project's greatest challenges. Through detailed planning, phased construction, and close coordination among Port staff, the CMAR team, tenants, and marine operators, construction activities were sequenced to minimize disruptions and maintain cargo movement and adjacent vessel access whenever possible. Ongoing communication allowed the team to adapt to changing conditions while preserving operational reliability throughout the project.

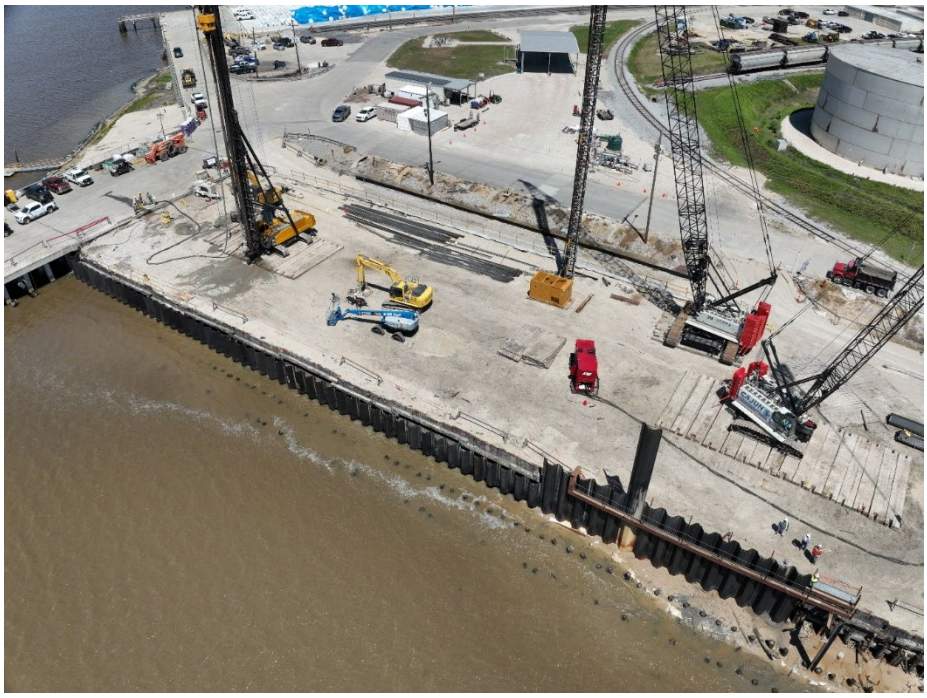


Figure 4 Steel Sheet Pile Installation Adjacent to Existing Structures

Relevance to Industry Priorities

The project directly addresses many of the most pressing challenges facing ports today, including aging infrastructure, supply chain resiliency, operational efficiency, asset lifecycle management, and the need to maintain active operations during major capital improvements. By replacing nearly century-old waterfront infrastructure with a modern, resilient facility while maintaining cargo operations throughout construction, the Port of Lake Charles has demonstrated how strategic investment and disciplined project delivery can strengthen long-term competitiveness and support evolving maritime industry demands.

Industry Leadership and Best Practices

The Berths 4, 5, and 6 Wharf and Shed Reconstruction Project exemplifies industry best practices in the planning, design, and execution of complex marine infrastructure improvements. By combining resilient engineering solutions with phased construction management, proactive stakeholder engagement, and a collaborative CMAR delivery approach, the Port successfully modernized waterfront infrastructure within an active terminal.

This integrated approach provides a practical and scalable framework for ports facing similar challenges related to aging facilities, evolving cargo demands, and operational continuity during major capital improvements.

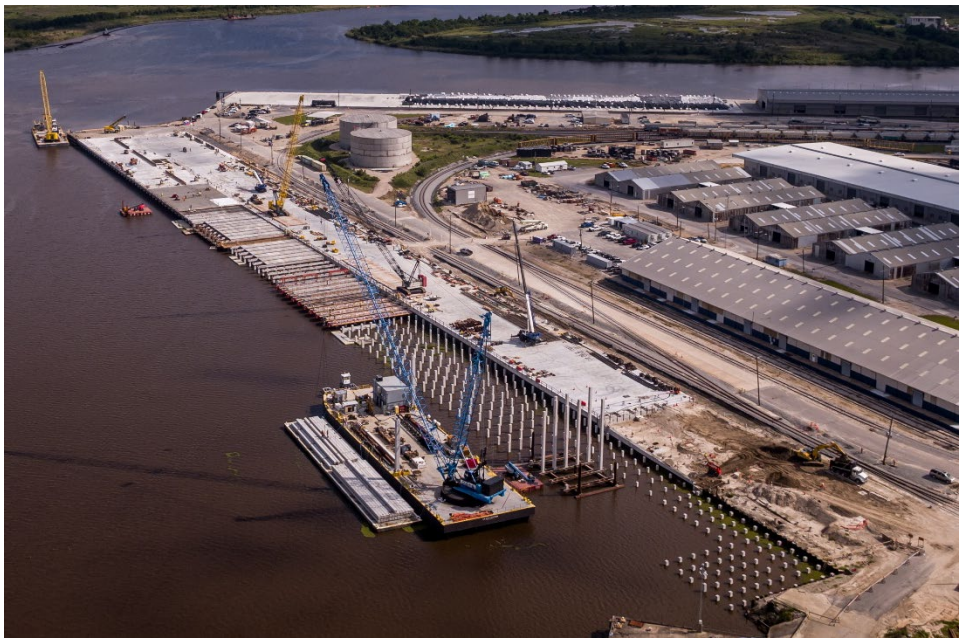


Figure 5 Multiple Phases of Construction in Progress

4. Results, Evidence & Impact

Operational and Quantitative Results

Although the Berths 4, 5, and 6 Wharf and Shed Reconstruction Project remains under construction, it is already positioned to deliver substantial operational improvements that will strengthen the Port's ability to safely and efficiently support maritime commerce for decades to come. The project replaces aging and hurricane-damaged infrastructure with modern, resilient facilities that will improve structural reliability, enhance cargo-handling efficiency, reduce maintenance requirements, and increase operational flexibility.

Upon completion, the project will restore Berths 4, 5, and 6 to full cargo operations and replace approximately 195,000 square feet of unusable transit shed and storage space and 1700LF of wharf. The modernized facilities are expected to significantly increase cargo-handling capacity for key commodities, including bagged goods, forest products, and project cargoes. Current projections indicate annual increases of approximately 200,000 tons of bagged goods, 800,000 cubic meters of forest products, and additional project cargo to support the local industrial boom in the area. The addition of the Ro/Ro facility also opens the opportunity for military cargo to return the Port. By reestablishing centralized cargo loading, unloading, and storage operations at Berths 4, 5, and 6, the project will eliminate many of the inefficiencies that emerged after hurricane-related facility losses forced cargo operations to be dispersed throughout the terminal.

Economic and Regional Impact

The reconstruction project represents a significant investment in the economic future of Southwest Louisiana and the regional maritime industry. By restoring critical cargo-handling infrastructure, the project enhances the Port's competitiveness, improves supply chain reliability, and supports the continued growth of industrial and maritime activity throughout the region. The modernized facilities will help retain existing business, attract new cargo opportunities, support maritime-related employment, and provide the infrastructure necessary to accommodate future cargo diversification and industrial development.

Safety, Resiliency, and Long-Term Benefits

A central objective of the project is the replacement of deteriorated infrastructure that had reached the end of its useful life and no longer met the operational demands of a modern marine terminal. The reconstructed wharves and transit sheds incorporate modern engineering standards, improved operational access, enhanced cargo-handling environments, and infrastructure designed to withstand the challenges of the Gulf Coast environment. These improvements will reduce operational risks, improve safety for personnel and terminal users, and provide greater resiliency against future storm events. Additionally, property insurance underwriters can directly see those improvements and measures taken and have awarded the Port with rate reductions year over year.

The benefits of the project extend far beyond infrastructure replacement. The reconstructed facility will provide a long-term foundation for sustainable growth by extending asset service life, reducing lifecycle maintenance costs, increasing operational flexibility, and improving the Port's ability to respond to changing market conditions. As a result, the project strengthens the Port of Lake Charles' role as a critical transportation hub and economic driver while creating resilient infrastructure capable of supporting maritime commerce and regional prosperity for generations to come.

Lessons Learned

One of the project's most valuable lessons was the importance of early contractor involvement when reconstructing aging marine infrastructure. The combination of hurricane damage, deteriorated facilities, and undocumented historical modifications required continuous collaboration among the Port, designers, contractors, and operations staff. Early stakeholder engagement and the CMAR delivery method improved constructability, strengthened decision-making, and helped minimize operational disruptions.

The project also demonstrated the value of maintaining continuity between design and construction teams, implementing phased construction strategies, and emphasizing resilient design and lifecycle planning. Together, these practices improved project execution, reduced long-term risk, and provided a framework for future marine infrastructure modernization efforts.



Figure 6 Marine and Land Side Construction Progress

5. Integration, Adaptability & Scalability

Integration, Adaptability, and Scalability

The Berths 4, 5, and 6 Wharf and Shed Reconstruction Project was designed to integrate seamlessly with existing Port infrastructure, ongoing reconstruction efforts, and active cargo operations throughout the City Docks Terminal. The reconstructed facilities were carefully planned to maintain full compatibility with existing vessel operations, utility systems, rail and truck access, and terminal logistics while significantly improving overall operational efficiency and functionality.



Figure 7 Construction Progress and Ongoing Operations

A key element of project success was the ability to coordinate construction activities with multiple ongoing operations within an active marine terminal environment. The integration strategy accounted for existing cargo handling activities, utility and infrastructure networks, maintenance practices, and other concurrent capital improvement projects, ensuring that construction progressed with minimal disruption to Port customers and terminal users.

In addition to integration with current operations, the project was intentionally designed with long-term adaptability in mind. Structural systems were engineered to accommodate modern cargo-handling equipment and heavier loading requirements, while upgraded fender and mooring systems allow the facility to serve larger contemporary vessels. The clear-span transit shed configuration provides flexible operational space capable of supporting multiple cargo types, and the inclusion of rail and truck connectivity enhances multi-modal functionality. The design also incorporates hurricane-resistant construction standards and considers long-term environmental conditions, including projected sea level rise along the Gulf Coast, ensuring resiliency and durability for future generations of use.

Beyond adaptability, the project serves as a scalable model for similar marine infrastructure modernization efforts at ports facing aging facilities and the need to maintain operations during

reconstruction. Key best practices include phased construction within active terminals, reconstruction around existing infrastructure, early stakeholder engagement, integrated project management, and proactive risk mitigation strategies. These approaches provide a replicable framework that can be applied by other ports undertaking complex waterfront redevelopment projects while maintaining operational continuity.

Collectively, these design and delivery strategies ensure that the Berths 4, 5, and 6 reconstruction not only meets current operational needs but also positions the Port of Lake Charles for long-term flexibility, resilience, and sustained growth within an evolving maritime industry.



Figure 8 Fender Installation

6. Stakeholder Engagement & Collaboration

Collaborative Project Delivery

The success of the Berths 4, 5, and 6 Wharf and Shed Reconstruction Project was driven by strong collaboration among Port leadership, operations personnel, engineering consultants, contractors, tenants, regulatory agencies, funding partners, and other key stakeholders throughout planning, design, and construction.

Because the project involved rebuilding critical waterfront infrastructure within an active marine terminal, continuous coordination was essential. Port staff from engineering, operations, maintenance, and executive leadership worked closely with the CMAR team, designers, and contractors to align construction activities with operational priorities, manage schedule

adjustments, address safety considerations, and minimize impacts to customers and cargo operations.

The Port also maintained proactive communication with tenants, marine operators, regulatory agencies, and funding partners throughout the project lifecycle. Regular coordination meetings and collaborative problem-solving efforts enabled the team to address evolving field conditions, maintain regulatory compliance, and successfully balance ongoing terminal operations with major construction activities. This integrated approach strengthened stakeholder relationships, minimized operational disruptions, and contributed significantly to the project's successful delivery.



Figure 9 Transit Shed Construction Along Active Operations

Community and Economic Impact

Beyond the reconstruction of critical marine infrastructure, the project supports broader economic and community objectives throughout Southwest Louisiana. By restoring and modernizing a key cargo-handling facility, the Port has strengthened its ability to support existing industries, attract new business opportunities, and facilitate the efficient movement of goods throughout the region.

The investment reflects the Port's long-term commitment to economic development, workforce growth, supply chain reliability, and sustainable maritime commerce. The modernized facilities will help preserve and create jobs, enhance the competitiveness of regional industries, and provide resilient infrastructure capable of supporting future growth. As a result, the project further reinforces the Port's role as a vital economic engine for Southwest Louisiana and a critical link in regional and global supply chains.

7. Conclusion

The Berths 4, 5, and 6 Wharf and Shed Reconstruction Project demonstrates how strategic investment, innovative project delivery, and resilient design can transform aging waterfront infrastructure into a modern, high-performance cargo facility. By restoring critical cargo capacity, strengthening supply chain resiliency, supporting regional economic growth, and maintaining operations throughout construction, the Port of Lake Charles has created a model for infrastructure modernization that can be replicated throughout the maritime industry.

The project also provides a scalable framework for ports facing similar challenges of aging infrastructure and operational continuity. Key lessons learned—including phased construction within active terminals, reconstruction around existing infrastructure, early stakeholder engagement, integrated project management, and proactive risk mitigation—offer proven strategies that can be applied to future waterfront redevelopment efforts.

More than a reconstruction project, this initiative represents a long-term investment in the future of the Port, the maritime transportation system, and the industries and communities that depend upon them. By combining resilience, operational efficiency, and collaborative project delivery, the project establishes a benchmark for sustainable and adaptable marine infrastructure development.

Beacon of Excellence Statement

The Berths 4, 5, and 6 Wharf and Shed Reconstruction Project demonstrates how strategic infrastructure investment can simultaneously advance operational performance, resiliency, economic development, and long-term asset sustainability. By modernizing critical cargo facilities while maintaining ongoing maritime operations, the project improved the Port's ability to serve regional industry, support supply chain reliability, and accommodate future growth. Through collaborative stakeholder engagement, resilient engineering, and innovative project delivery, the Port successfully transformed aging infrastructure into a modern, adaptable facility that delivers lasting benefits to customers, the regional economy, and the maritime industry.