

## RFEI RESPONSE

**Project:** Brooklyn Marine Terminal Port Operations and Maritime Industrial Uses



**Proposer:** Persak & Wurmfeld Engineering D.P.C.

**Date:** December 15, 2025

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## 1. COVER LETTER

PERSAK & WURMFELD (P&W) is pleased to submit this RFEI to the New York City Economic Development Corporation for regarding the Brooklyn Marine Terminal Port Operations and Maritime Uses.

P&W is recognized as a leading naval architecture firm in the Northeast US. We tackle complicated projects on both sea and land and embrace the challenges of our homeport in New York City for being a centroid of technology, commerce, and transportation.

We are proud to lead a team that boasts extensive experience and expertise in design, naval architecture, and project management. Our team is large enough to effectively handle highly complex projects, yet small enough to deliver personalized service.

Locally focused, our firm strives to combine the art of design, engineering, and cutting-edge technology to revolutionize the design, construction, modification, and management of large, complicated projects. Our detailed and process-oriented approach helps clients get complex projects built—on the water and off—in an efficient way.

Every member of the project team believes in the purpose and importance of the Brooklyn Marine Terminal and its potential impact on our local maritime economy.

Please note the following key points from our interest:

- Experience with all local ferry vessels and their operators
- Strategic alliance with local operators pursuing the Blue Highways trade.
- Experts in All Phases of marine projects
- Successful Ongoing Relationship w/ NYC City Agency (NYCDDC).
- Proven Project Delivery Methods
- Experience Representing all Project Stakeholders (Owners/Shipyards/D&E)

All comments and questions are welcome, and we look forward to further discussions and next steps.



Carl J. Persak III



Jeremy Wurmfeld

## 2. PERSAK & WURMFELD

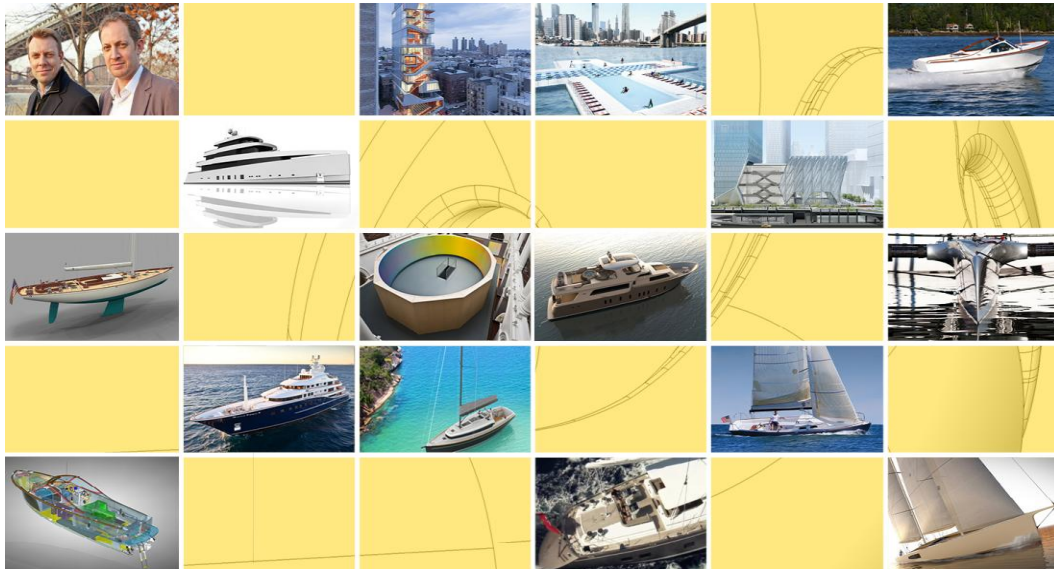
### 2.1. History

PERSAK & WURMFELD (P&W) is the only full-service naval architecture firm headquartered in Brooklyn.

Founded in 2007 to lead the next generation of design and naval architecture, P&W has long provided design and engineering services for yachts and commercial vessels.

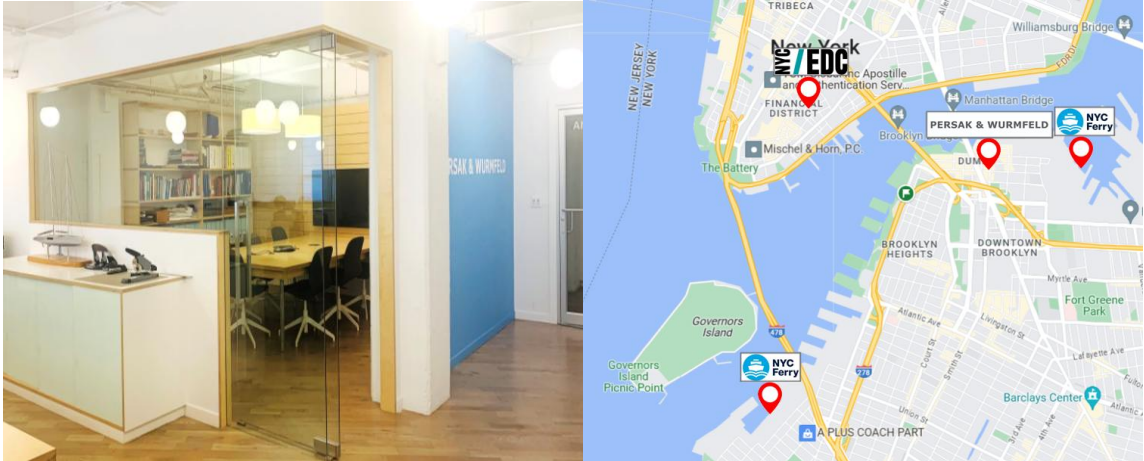
Throughout its history P&W has been regionally focused and as a result developed a strong network with local shipyards, vendors, and subcontractors. Our projects cover a wide range of vessel sizes, types, materials, and locations, with several examples of commercial vessel refits and repowers. In this market P&W's unique strength is that we work for both vessel owners and shipyards, and as such can maintain both perspectives in our work and ensure successful outcomes for both sides of a given project.

P&W's multi-disciplined approach remains the link between a diverse set of projects that has grown beyond the marine industry to also include large scale land-based projects.



## 2.2. Headquarters

P&W is based in a state-of-the-art office in the “tech triangle” Dumbo section of Brooklyn. Our office offers a project friendly floorplan with open space workspace for team partners as needed.



## 2.3. Goals & Objectives

P&W aims to combine our team’s diverse professional experiences and proven technical prowess with empathy, tenacity, and communication skills that allow us to design and engineer solutions, solve problems, and complete complex yacht, ship, and architecture projects better than any other firm in the world.

The P&W approach is born from boots on the ground, on the water experience that brings a level of practicality and cost effectiveness to all its work products.

## 2.4. Philosophy

P&W believes in simple and elegant solutions result in successful and distinctive projects.

We have a passion for problem solving while marrying art and science with our varied practical experience to design, engineer, and manage projects around the world.

While much of our work serves the marine industry, we are continually inspired by good design and engineering everywhere, and consistently strive to bring these perspectives into our daily work.

P&W provides exemplary customer service by actively listening, communicating, and collaborating with our clients throughout the project to ensure their visions are not only met but exceeded while maintaining a standard of technical excellence.

## 2.5. M/WBE Partnerships

P&W fosters professional partnerships via subcontracting that are representative of our diverse communities and the general population of our home in New York City. We seek to identify and create business opportunities for Minority/Women-owned Business Enterprises (M/WBEs) within all our projects and are enthusiastic in our pursuit of these goals. To date, all our projects have been contracted without formal M/WBE requirements, but we have worked with the team members listed herein for many years and are confident in our collective commitment to achieving a successful meaningful participation rate with our M/WBE partners that are all on track for certification in advance of contract signing.



## 2.6. Brooklyn Boatworks

In addition to our professional and commercial work, PERSAK & WURMFELD supports the non-profit charity BROOKLYN BOATWORKS which was co-founded in 2005 by Jeremy Wurmfeld and Carl Persak.

This charitable organization distinguishes itself by encouraging, inspiring, and empowering young people through boat building & sailing and by creating learning environments grounded in respect, support and dignity for all students.



### 3. PERSAK & WURMFELD TEAM

#### 3.1. Jeremy Wurmfeld, Principal



JEREMY WURMFELD co- founded PERSAK & WURMFELD in 2007 following several years of successful collaboration with Carl Persak at Sparkman & Stephens and then in private practice for himself.

Jeremy is a graduate of Grinnell College and the Westlawn Institute of Marine Technology. He is a lifelong sailor with extensive sea time on a wide range of vessels from superyachts to dinghies. Jeremy's post graduate experience was spent as a Design Architect and Licensed Captain. He then spent five years designing and engineering yachts with Sparkman & Stephens prior to founding his own practice in 2004.

#### 3.2. Carl Persak, Principal



CARL PERSAK co- founded PERSAK & WURMFELD in 2007 following several years of successful collaboration with Jeremy Wurmfeld while at Sparkman & Stephens and then in private practice for himself.

Carl Persak became a licensed New York State Professional Engineer in 2006 and is a graduate and post-graduate of Webb Institute of Naval Architecture. Carl spent several years as a naval architect in the commercial marine sector with Elliott Bay Design Group prior to spending four years with Michael Peters Yacht Design and seven years with Sparkman & Stephens. He founded his own practice in 2005.

#### 3.3. Myles Cornwell, Naval Architect



MYLES CORNWELL is a graduate of Carnegie Mellon University and has a Master of Science in Maritime Engineering Science from the University of Southampton.

Myles has a wide range of experience in the marine industry having worked as a superyacht designer/engineer in both a shipyard and design office. Prior to joining Persak & Wurmfeld, he served as the Technical and Executive Director of the Sailing Yacht Research Foundation, funding and managing research on the performance of sailing yachts.

#### 3.4. Aishwarya Avvari, Project Management



Aishwarya Avvari brings project management, document and database management, data reporting/dashboarding, cost estimating, bid packaging, and contract coordination to our project team.

Aishwarya always brings a tech forward and problem-solving approach to project team collaboration that helps achieve project goals and objectives within the time and budgetary constraints.

## 4. REFERENCE CONTACTS

P&W is proud to have worked with the following References during our history.

**Timothy O'Brien**

NYC Ferry  
Pier 3, Hornblower Landing  
San Francisco, CA 94111  
[REDACTED]

**Woon Lam**

NYC Department of Design and Construction; Program Director, Cultural Institutions, Public Buildings  
30-30 Thomson Avenue  
Long Island City, NY 11101  
[REDACTED]

**Maggie McNicholas**

Brooklyn Boatworks  
20 Jay Street, Unit 824B, Brooklyn NY 11201  
[REDACTED]

**Ilana Mayid-Dennis**

US Coastal Service  
234 Fifth Avenue, New York NY 10001  
[REDACTED]

**Seth Tane**

6<sup>th</sup> Boro Marine  
165 Court Street #143, Brooklyn NY 11201  
[REDACTED]

**Matt Perricone**

Lehigh Maritime  
Pier 11, Brooklyn NY 11215  
[REDACTED]

**Paul Boardman**

VoloX  
New York, NY  
[REDACTED]

**Sam Merritt**

Schooner Apollonia  
Hudson, NY  
[REDACTED]



## 5. EXPRESSION OF INTEREST

### 5.1. Introduction

P&W is largely in favor the current BMT plans, and as residents of nearby Brooklyn neighborhoods are largely invested in it being a success.

The following are points where we directly express interest in the sites development and end usage.

### 5.2. Naval Architecture & Marine Engineering Hub

New York City was once upon a time the global center of the naval architecture and marine engineering industry. This is evidenced by the legacy of the large firms that once upon a time had their headquarters in the financial district and mid-town neighborhoods of Manhattan.

It is not a coincidence that three of the leading institutions developing naval architect and marine engineering talent, namely Webb Institute of Naval Architecture, SUNY Maritime, and the US Merchant Marine Academy are all located within a 50-mile radius of the BMT's location.

Unfortunately, most if not all that talent moves on to pursue careers outside of the tri-state area due to adequate industry to facilitate career opportunities.

Our office advocates that the BMT house a post-college continuing education facility where both hard and soft naval architecture and marine engineering skills are not only developed but kept in our local economy. This type of facility demands a waterfront location and requires access to the water and vessels, something unique to what the BMT offers.

This local engineering talent would become a technical backbone of not only the Blue Highways, but the global marine industry, and something the EDC could point to a true Economic Development.

### 5.3. Community Programming

As founders of Brooklyn Boatworks it is our duty to advocate for both land and water access to space to execute community programming. For the BMT, which is water facing, it make sense that said community programming has a direct connection to the maritime industry it supports.

Brooklyn Boatworks delivers its unique boat building program to middle schools local to the BMT. For our first 20 years, the program was a one-year boat build, but now has expanded to a four year program focused on career development.

Brooklyn Boatworks would be interested in establishing its four-year school inside the BMT. The students that go through that school would have direct access to maritime activities therein with the goal of that would be a direct feeder to those industries.

Further, Brooklyn Boatworks would be interested in water access to build on its thriving sailing program, where first time sailors are taught how to sail the boats they built. This type of exposure is truly life altering for our students, it builds skills and confidence, and introduces them to a community and life sport otherwise hard to find in the public school system.

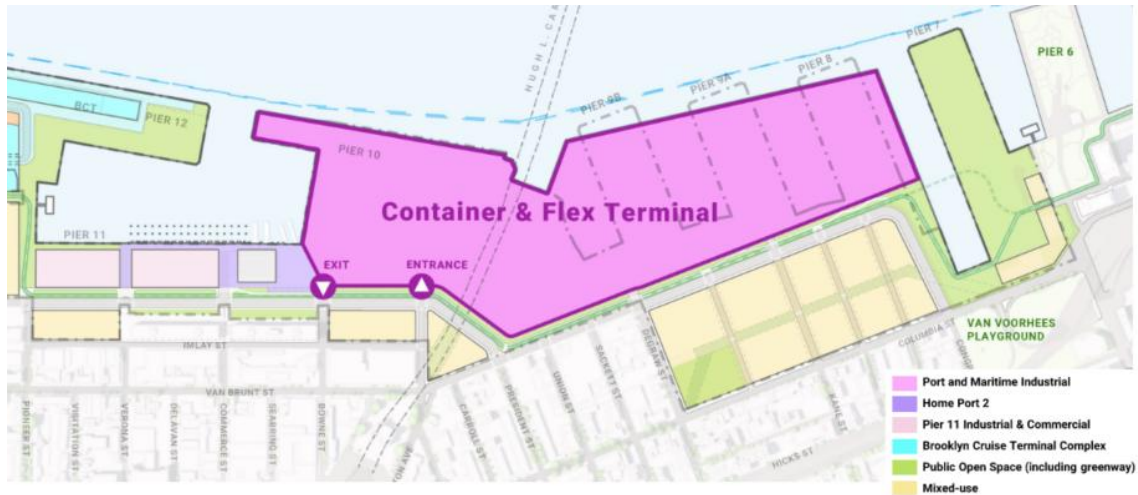
### 5.4. Blue Highways Hub

Persak & Wurmfeld is very interested in the BMT being a successful hub of the Blue Highways initiative.

For the past three years our office has been studying the water-side elements of short sea shipping and has been actively prototyping the 'new cargo' that these systems will eventually be carrying.

We also are encouraged that the EDC has embraced a roll-on roll-off ferry as the model, and our past and current clients include US Coastal and 6<sup>th</sup> Boro Marine.

That said, the current plan as indicated for the Flex Terminal is not the appropriate type of layout to support this type of vessel on and off loading, as see below.



The 'seawall' approach that faces Buttermilk Channel is only appropriate for the largest of vessels as they are the only ones that would be able to absorb the rough waters, high waves, and strong currents in this area.

Our office, combined with the collation of organizations listed in the REFERENCE CONTACT section, is prepared to work with the EDC to create more of an embayment here (as opposed to landfill) and remove the old dead piers.

As a reference, our office designed and engineered the outer floating wave attenuation system at Brooklyn Bridge Park marina, and believe we could build on that experience to create a real, protected hub of the Blue Highways.



## **5.5. Atlantic Basin**

Persak & Wurmfeld has direct interest in Atlantic Basin and it remains a location for commercial marine support.

Much as the needs of the NYC Ferry and the homeport concept, Blue Highways will also need similar support both on land and in the water.

Our office is prepared to help the EDC outline commercial use of this space to dock and service vessels active in the Blue Highways. This type of local infrastructure does not exist within a reasonable distance to the harbor, and the BMT offers that opportunity and capability.

## 6. PAST PROJECTS

**0217**

USN Submarine  
Restoration



Serving as a lead naval architect and project manager for this historic submarine in Pittsburgh. Scope includes providing a feasibility study and an analysis on how to stabilize and preserve the vessel.

[Ongoing.](#)

**0214**

36' Passenger  
Vessel



Providing naval architecture services for the owner of an historic vessel operated as an auxiliary sailing small passenger vessel. Working with USCG to resolve confusion surrounding past stability analysis and increase the number of passengers the vessel can safely carry. [Ongoing.](#)

**0212**

50' Passenger  
Vessel



This wooden recreation of an historic oyster dredge will be operated as a small passenger vessel. P&W provided expertise on certification to small passenger vessel Subchapter T regulations and performed the vessel's stability test.

[Completed 2023.](#)

**0211**

79' Passenger  
Vessel



Following the conversion of these high speed catamaran ferries from waterjets to fixed propellers, P&W performed the vessel's deadweight surveys with the USCG and determined the vessel's new lightship condition.

[Completed 2023.](#)

**0202**

79' Passenger  
Vessel



The passenger vessel was previously forbidden from carrying passengers on its second deck, P&W reviewed the vessel's stability and structural scantlings and submitted calculations to USCG which successfully removed the limitations.

[Completed 2023.](#)

**0199**

294' P/V  
Conversion



The general intent is to convert the passenger ferry into a floating dockside destination venue that can be moved from location to location, state to state, depending on business planning and programming opportunities. P&W has been hired to do oversee the Design & Engineering effort of this conversion. [Ongoing.](#)



**0188**  
Historic  
Lightship



Serving as the prime engineer and naval architect for the design services for the stabilization and restoration of 1907 Lightship Ambrose. Scope includes designing and engineering all of the vessel's systems and overseeing the construction phase of the project. [Ongoing.](#)

**0183**  
105' Passenger  
Vessel



Served as naval architect and project manager for the complete refit of this 105' aluminum USCG Subchapter-K passenger ferry. Scope included all USCG required drawings and calculations, including stability, safety, structural, propulsion, electrical, electronics, auxiliary systems, and interior/exterior outfitting. Developed scopes of work and sourced labor and materials. [Completed 2021.](#)

**0175**  
41' Passenger  
Vessel



The project involved rehabilitating a United States Coast Guard 41' Utility Boat to be put into service for a variety of educational and promotional reasons. Provided design and engineering services for the same and coordinated with various subcontractors and shipyard to deliver the boat. P&W was the primary point of contact with the USCG during the COI process until complete. [Completed 2022.](#)

**0166**  
Lab Project



This complex, modular lab space project includes design and fabricating of (4) highly customized special purpose rooms that are intended for conducting and displaying scientific experiments while sustaining an electronically controlled range of temperature, humidity, light, and atmospheric chemistry. . [Ongoing.](#)

**0158**  
208' steel  
Historic vessel



Serving as naval architect in early stages of historic preservation project. Scope includes full vessel 3D scan and structural shoring design for vessel transport from Buffalo NY to Hudson River valley. [Completed 2020.](#)

**0141**  
156' steel  
offshore supply



Created an IMO-compliant stability booklet for a 156' steel offshore supply vessel, including all intact and damage stability supporting calculations. [Completed 2019.](#)



**0136**  
700' steel  
wave attenuator



Served as naval architect for design, engineering, and construction administration for a new-build 700' steel wave attenuation system installed in NY Harbor. Management scope included building oversight that included scheduling, site visits, and weekly project calls/meetings.

[Completed 2019.](#)

**0134**  
73' aluminum  
fishing vessel



Executed a USCG-witnessed inclining experiment for a 73' aluminum fishing boat following a refit and provided subsequent calculations and documentation for a stability letter.

[Completed 2018.](#)

**0132**  
70' aluminum  
fishing vessel



Executed a USCG-witnessed dead weight survey for a 70' aluminum fishing boat following a refit and provided subsequent calculations and documentation for a stability letter.

[Completed 2018.](#)

**0127**  
950' steel  
USNS supply  
vessel



Provided engineering and as-built drawings for various systems upgrades on a 950' steel naval supply vessel while in dry dock. Oversaw and performed an inclining experiment at the end of the dry dock period to ABS and USCG approval.

[Completed 2018.](#)

**0119**  
950' steel  
USNS supply  
vessel



Provided engineering and as-built drawings for various systems upgrades on a 950' steel naval supply vessel while in dry dock. Oversaw and performed an inclining experiment at the end of the dry dock period to ABS and USCG approval.

[Completed 2017.](#)

**0116**  
908' steel  
USNS supply  
vessel



Provided structural drawings for hull modifications in way of stabilizer fin removals.

[Completed 2016.](#)

**0113**

908' steel  
USNS supply  
vessel



Provided structural drawings for hull modifications in way of stabilizer fin removals.

[Completed 2016.](#)

**0112**

950' steel  
USNS supply  
vessel



Provided engineering and as-built drawings for various systems upgrades on a 950' steel naval supply vessel while in dry dock. Oversaw and performed an inclining experiment at the end of the dry dock period to ABS and USCG approval.

[Completed 2016.](#)

**0103**

60' aluminum  
research vessel



Provided structural modification plans for vessel sonar foundations on a 60' aluminum research vessel. Provided oversight of fabrication at a local shipyard.

[Completed 2014.](#)

**0098-08**

50' steel  
ferry dock



Served as lead naval architect for the development of a new steel ferry dock at Alcatraz Island. Scope included the design and engineering of the dock, mooring equipment, and gangway system. Scope also included the process engineering and oversight of an overnight dock swap to eliminate service interruption to the island. [Completed 2016.](#)

**0098-01**

75' steel  
LCM8 landing  
craft



Served as naval architect and engineer for the re-power of a steel LCM8 landing craft servicing Alcatraz Island. Scope included the design and engineering of all associated propulsion, structural, electrical, controls, and auxiliary support systems. [Completed 2014.](#)

**0093**

NYS public  
vessel stability  
assessment



Served as a consultant to the NY State Marine Services Bureau to assess that status of stability compliance for its fleet of 350 public vessels following the Ethan Allen accident. Developed a methodology for proper stability assessment and performed stability tests on non-compliant vessels. [Completed 2013.](#)

**0080**

30 - 45'  
aluminum  
landing craft



Served as naval architect for the re-power of (4) aluminum Panama Canal landing craft ranging from 30' - 45'. Scope included the design and engineering of all associated propulsion, structural, electrical, controls, and auxiliary support systems.  
[Completed 2012.](#)

**0073**

285'  
steel/aluminum  
motor yacht



Served as project engineer for the largest motor yacht built in the US in Bridgeport, CT. Scope included oversight and management of all construction related engineering and a team of over 200 engineers around the world. Scope also included class and flag compliance including all as-built plans and calculations, dock/sea trials, delivery, and final inclining test.  
[Completed 2010.](#)

**0068**

75' steel  
Tugboat



Served as naval architect for the re-power of a 75' steel tugboat in Honduras. Scope included the design, engineering, and construction oversight of all propulsion, structural, electrical, controls, and auxiliary support systems.  
[Completed 2010.](#)

**0052**

53' aluminum  
pilot vessel



Served as naval architect for re-powering in Panama of (21) 53' aluminum pilot vessels run by the Panama Canal Authority. Scope included the design, engineering, and construction oversight of all propulsion, structural, electrical, controls, and auxiliary support systems.  
[Completed 2008.](#)

## 7. TECHNICAL APPROACH

Every vessel project presents challenges that are common to most vessels but at the same time distinctive to each vessel afloat. At P&W we believe for every technical challenge there will be a prior and proven method of remedy that we will identify and engineer in detail to be enacted on this project.

For all disciplines of the project, the project team will utilize our respective Naval Architecture, Marine Engineering, and Project Management training to provide a standards-based solution to each design and engineering item in the project scope. All equipment will be specified in detail and fully integrated to ensure not only schematic function but address practical concerns such as installation and maintenance parameters.

### 7.1. Existing Project Information

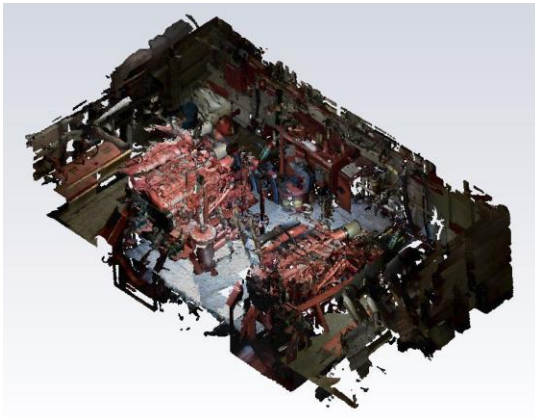
All P&W projects begin with establishing the available project information and both cataloging and loading it into our information system.

This establishes a clear baseline that will allow for successful decision making over the remainder of the Design Phases. This initial effort will include but not be limited to the review of any existing drawings, calculations, studies, specifications, and quotations that exist for the vessels.

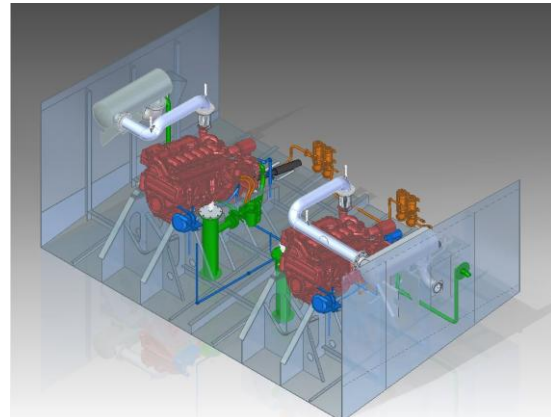
### 7.2. Vessel Information

The next step in our process is to visit the vessel itself and gather the information we will need to complete the information baseline process. This will often include sea trials, dock trials, initial inclining or deadweight survey. Where needed this may include a full vessel survey and/or structural survey and gauging.

Regardless of the project our process relies on gathering the vessel into our 3D world. P&W owns the technology for this scanning and subsequent processes, and large or small project immediately benefit from accurate field measurements.



Laser Scan Data



Resulting Engineering Model

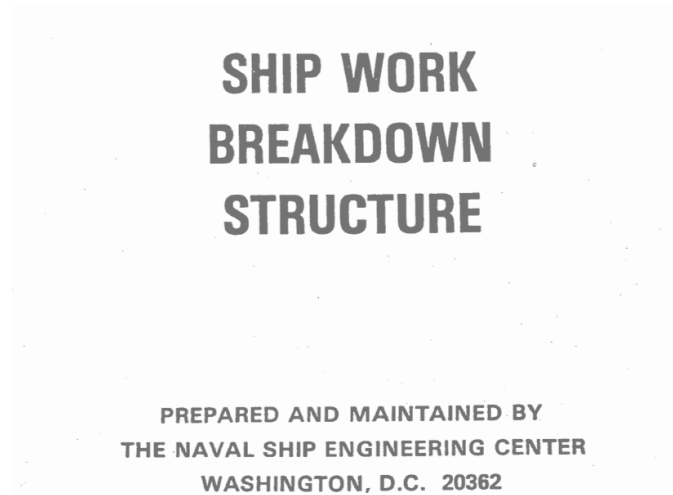
### 7.3. Stakeholder Parameters

The last stop along the project information baseline process is to establish and document the important parameters set for by the applicable Stakeholders.

In the case of this project, the DEC has already listed the important elements of the project, but P&W would also go further to gather additional rounds of information from all stakeholders, which typically includes decision makers, project managers, and vessel captain and crews.

#### 7.4. Ship Work Breakdown Structure (SWBS)

A hallmark of P&W projects is a well-organized and forward looking SWBS (Ship Work Breakdown Structure). All the technical data along with the design and engineering details that a project will generate are well managed by a commitment to the SWBS.



The P&W SWBS is based on the US NAVY SWBS but modified to be more suitable to the civilian markets, and generally modifies slightly based on the unique elements of a given process.

Once developed the SWBS would be used to catalog the information from Sections 9.1 to 9.3, and we offer our clients the option to utilize the P&W SWBS for all segments of the design, engineering, specification, costing, scheduling, issuing tracking, fabrication scopes, and even timekeeping going forward.

#### 7.5. Standards-Based Approach

P&W prides itself in taking a Standard-Based approach to our design and engineering work, and over the years have developed the expertise to apply the correct standards to a given project. We find this approach not only results in successful technical outcomes but provides a great value and piece of mind to our clients.



**RULES FOR BUILDING AND CLASSING  
STEEL VESSELS  
2019**

**PART 3  
HULL CONSTRUCTION AND EQUIPMENT**

(Updated July 2019)

American Bureau of Shipping  
Incorporated by Act of Legislature of  
the State of New York 1862

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1701 City Plaza Drive  
Spring, TX 77389 USA

CODE OF FEDERAL  
REGULATIONS

**46**

Parts 1 to 40  
Revised as of October 1, 2018

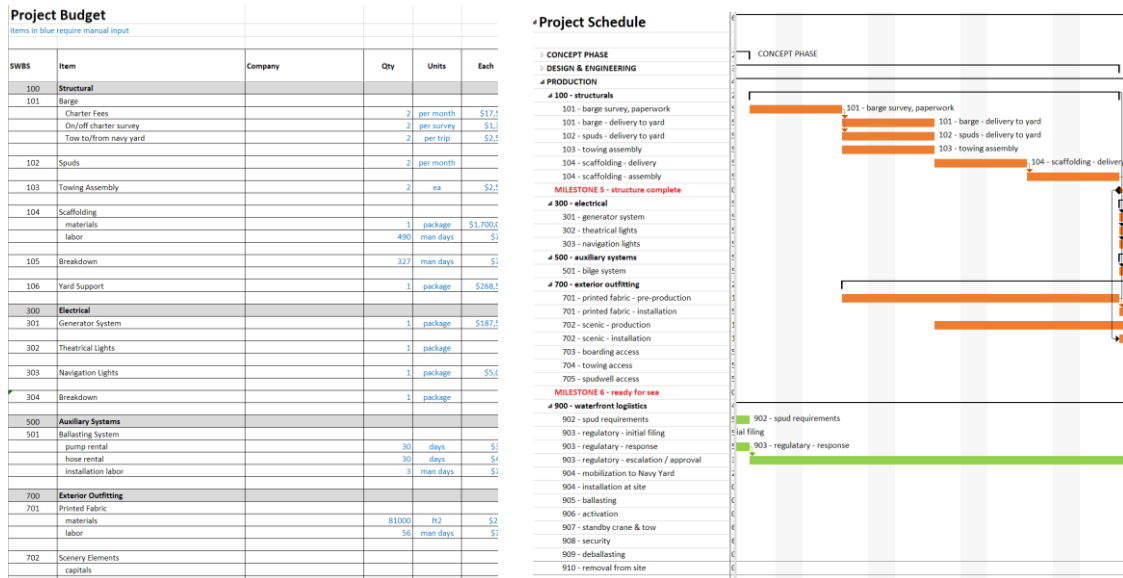
Shipping



## 7.6. Project Budget & Schedule

The P&W SWBS also provides the structure for tracking and maintaining budget and schedule of the project, speaks to the SWBS capacity as a universal organization tool.

Cost and schedule tracking tools will be formatted with the same SWBS. We typically utilize a combination of database and dashboarding for cost tracking and detailed gantt charts for Schedule definition and tracking. A small excerpt from a typical project schedule is below:



## 7.7. Project Scope Definition

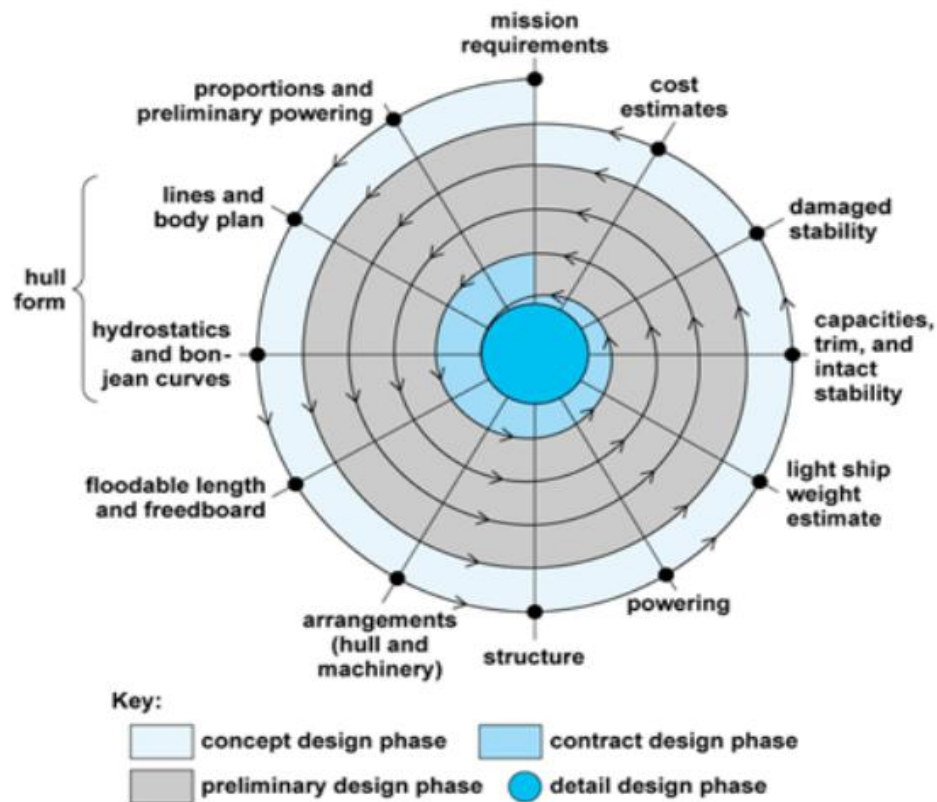
With sections 9.1 through 9.5 complete we then create the inventory of required Design, Engineering, and Managerial Deliverables that fulfill the projects technical scope, addresses the client's needs, addresses any and all regulatory requirements, and provide the correct information to support the project's construction.

The result is a P&W Project Scope Definition that provides a SWBS-based accounting of all deliverables, including which party is responsible, and what project phase they will need to be accomplished.

Project Scope Definition												
SWBS Major	SWBS Minor	CSI	DDC #	SSSM #	Title	Prime	Second	Comment	SD	DD	BID & CD	CA
	027	02	S.A.2	2.a.i	Laser Scan	P&W	Sub		100%			
	028	02	S.A.2		Probes List & Report	P&W		WSA	100%			
	030	01		2.a.vii	Existing Stability & Re-ballasting Study	P&W			100%			
	055	02	S.A.2		Existing General Arrangement Plan	P&W		WSA	100%			
	056	02	S.A.3		Deconstruction & Salvage General Plan	P&W		WSA	50%	100%		
	060	01	S.A.4&5	2.a.ii	Revised General Arrangement Plan	P&W		WSA	25%	50%	100%	
	070	01	S.A.4&5		Project Specification	P&W		WSA	25%	50%	100%	
	080	01	S.A.6		Circulation Plan & ADA Accessible Route	P&W		WSA	50%	100%		
	090		Gen.A		Bid Documents	P&W	WSA				100%	
	091		Gen.A		RFI Response	P&W	WSA				100%	
	092		Gen.A		Shop Drawing Reviews	P&W	WSA	TMS				100%
	095		Gen.A		Site Inspections & Notes	P&W	WSA	TMS				100%
100	100				Structural							
	101	05	S.C.2.a	2.a.viii	Structural Surveys - Floating	P&W			100%			
	102	05		4	Structural Removals & Historical Features List	P&W		WSA	100%			
	103	05		2.a.vi	Weld Surveys and Schedules	P&W	Sub			100%		
	104	05	S.C	16.a	Structural Surveys - Drydocked	P&W	Sub	P&W			100%	
	105	05		2.a.ix	Existing Structural Arrangement Plan	P&W		WSA	50%	100%		
	106	05		2.a.ix, 4.d	Structural Removals Plan	P&W		WSA	50%	100%		
	110	05			Revised Structural Arrangement Plan	P&W		WSA	50%	100%		
	115	05	S.C	16.b	Hull Frame Repair Details	P&W			50%		100%	
	120	05	S.C	4.e	Hull Plating Repair Details	P&W				50%	100%	
	130	05	S.C	4.e	Deck Frame Repair Details	P&W				50%	100%	
	135	05		5.d.ii	Deck Frame Addition Details	P&W				50%	100%	
	140	05	S.C	5.d	Deck Plating - New	P&W				50%	100%	
	150	05	S.C	2.a.iii	New Deckhouse Framing	P&W				50%	100%	
	160	05	S.C	2.a.iii	New Deckhouse Plating	P&W				50%	100%	
	170	05	S.C	5.d.iii	Deck Combing & Foundations	P&W				50%	100%	
200	200				Propulsion							
	201	11		2.a	Propulsion Survey	P&W			100%			
	202	11	S.D.1.k	16.f.i	Propulsion Removals & Historical Features List	P&W			100%			
	205	11			Existing Propulsion Arrangement Plan	P&W			50%	100%		
	206	11			Propulsion Removals Plan	P&W				50%	100%	
	210	11			Revised Propulsion Arrangement Plans	P&W				50%	100%	
	220	11		15.c	Steering System Restoration Plan	P&W				50%	100%	
	221	11		16.f	Rudder Inspection and Repair	P&W				50%	100%	
	230	11		16.f.i	Shaft In-Seal	P&W				50%	100%	

## 7.8. The Design Spiral

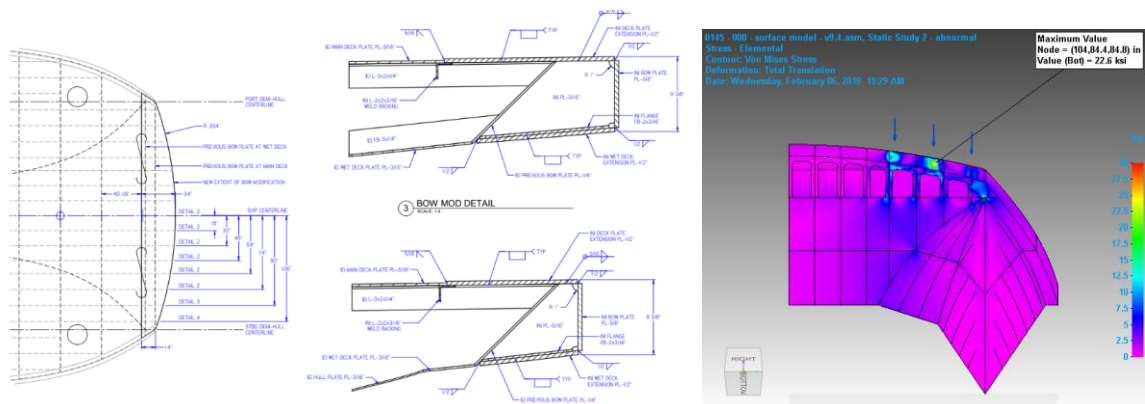
At P&W we utilize the concept of the Design Spiral as a critical part of our Naval Architecture projects.



Because a vessel must effectively join and balance ergonomic, performance, and practical concerns, it is important to consider an iterative process that considers all aspects prior to defining any single element in great detail, all the while returning to mission requirements to ensure the project is holistically fulfilling the needs of our clients.

## 7.9. Modern, Efficient Design & Engineering

P&W prides itself in researching, learning, and implementing the most modern and efficient design and engineering tools available.



## 7.10. Vessel Information Model (VIM™)

P&W channels information for complex projects into a centralized CAD platform trademarked as VESSEL INFORMATION MODEL or VIM™.



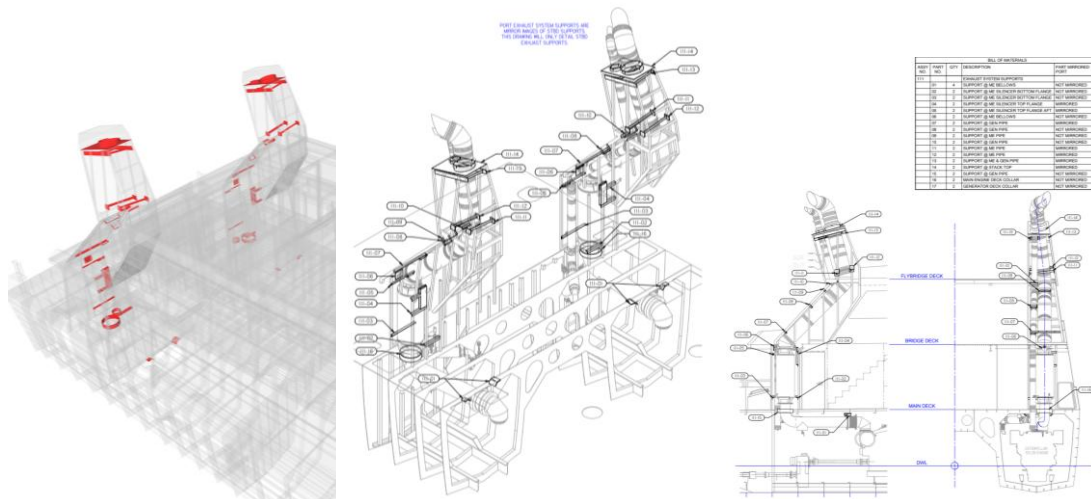
The P&W VIM™ provides scope gap and clash detection of the various elements on board the vessel so they do not occur in the field. It also allows the direct input of manufacturer's own 3D models for the most accurate integration of equipment, structure, and outfitting elements.

The P&W VIM™ creates all 2D design documentation directly from the centralized 3D model, and live update over the project phases.

## 7.11. VIM-Based Virtual Construction

The P&W VIM™ is organized into virtual 3D assemblies that are categorized by the building trade responsible for that assembly's fabrication.

This *VIRTUAL BUILDING* of the project will not only facilitate an efficient design/engineering phase, but also ensure that the project transition effectively to the construction phase.



## 7.12. Design Approval Database (DAD)

P&W uses a SWBS-based Design Approval Database (DAD) for issue tracking in all phase of a project.

By regularly updating the DAD and making it accessible the entire project team, all involved are aware of open, pending, or closed issues. The DAD will also live through project close-out, when all items need to be taken to 'closed' status.

Design Approval Document (DAD)														
Client:		Robert E. Derector												
Project #:		0145												
Vessel:		Straits Express												
Date:		2019-07-01												
Notes: RED - Robert E. Derector P&W - Persak & Wurmfield HB - Hornblower USCG - United States Coast Guard														
Major	Minor	Title	Status	Stew	USCG	HB	RED	P&W	Comment / Question	USCG	HB	RED	P&W	Response / Answer
500	503	bilge system	open	hb	12-Apr				Bilge System Schematic: submit drawing to OCM as 'modification to vital systems.'					29-May P&W: 5/29: who is working on this?
500	503	bilge system	to do	p&w		10-Apr			Bilge penetrations: new bilge outlets, outboard so you can see water flow				29-May	P&W: 5/29: need to model up HB proposed, locate penetration on 109
500	504	er fixed fire fighting	closed	p&w		29-Mar			ER F/F valves: confirm SeaSafety valves are triple pole, double throw.				4-Apr	P&W: 4/4: cut sheet confirming sent by sea safety, PO issued
500	504	er fixed fire fighting	open	p&w				10-Apr	Sea Safety Timing: when should they do the piping mods?			10-Apr		RED: 4/10: as late as possible, after insulation is completed.
500	504	er fixed fire fighting	to do	p&w				10-Apr	CO2 Bottles relocation: feed (2) bottles and rack to be relocated to port jet room to create separate CO2 systems. Will consider relocating remaining stbd system to bhd 24 inboard.	18-May			1-Jul	P&W: 5/14: confirm location of bottles post rifts with HB HB: 5/18: fed two bottles to move to port. All bottles to be mounted on inboard faces of hull to avoid issues if vessel hit on side P&W: 7/1: needs to be modeled & drawn
500	504	er fixed fire fighting	to do	p&w	12-Apr				Engine Room Fire Fighting Schematic: submit plan of modified system to MSC					
500	505	fresh water system	closed	hb		2-Apr			Tank Purchase & Delivery: can the tanks be ordered brought to yard? Need to install before main deck aft closes	8-Apr				HB: 4/8: tank delivered
500	505	fresh water system	to do	p&w					Fresh water main: rough run on water piping					
500	506	black water system	closed	hb		2-Apr			Tank Purchase & Delivery: can the tanks be ordered brought to yard? Need to install before main deck aft closes	8-Apr				HB: 4/8: tank delivered
500	506	black water system	open	p&w				1-Jul	Black Main & Toilets: basic arrangement for runs & penetrations					
500	507	fire main system	to do	p&w	12-Apr				Fire Main System Schematic: submit drawing to OCM as 'modification to vital systems.'					
500	507	fire main system	to do	p&w				10-May	Fire Main at Bridge Deck: existing fire station at bridge deck to relocate to aft stbd side of bridge deck aft bhd. Existing penetration at main deck to remain but pipe run to be re-done at main deck overhead.			13-May		P&W: 5/14: time to study routing of fire main. Independent review
500	508	deck drains	open	p&w				1-Jul	Deck Drains: new model & drawing					
500	509	tank vents & fills	open	p&w				1-Jul	Tank Vents: scope of drawing, technical info needed?					

## 7.13. Risk & Quality Control

At P&W we believe that the best way to manage risk and provide quality control is through a detailed, process-driven Technical Approach outlined in this section, and have repeated success for our clients and industry partners.



We're confident that P&W meets, if not defines, the highest standards as it is our mission to provide quality deliverables within an easy to follow and a systematic approach to ensure project success.

End Proposal.