WRANGELL SHIPYARD

WRANGELL, ALASKA

CONCEPTUAL DESIGN – COMMUNITY UPDATE

PREPARED FOR: CITY AND BOROUGH OF WRANGELL | JAG MARINE GROUP

PREPARED BY: PEARLSON & PEARLSON | GEI CONSULTANTS | EPPSTEIN UHEN ARCHITECTS

Project Team

- Pearlson retained by Wrangell and JAG to provide the Design Package
- Pearlson retained consultants GEI and EUA to assist in the development

City & Borough of Wrangell

SHIPYARD OWNER

- Key project decisions
- Project Oversight
- Requirements Development
- Communications with US Government & USCG
- Supporting Borough Infrastructure

JAG Marine Group

TASK CO-OWNER / SHIPYARD OPERATOR

- Project Oversight
- Requirements development
- Communications with US Government & USCG
- Shipyard Operations Plans

The Pearlson Group

CONSULTANT / OWNER'S REP

- Project Management Services
- Requirements Development
- Budget & Schedule Development
- Shiplift Concept Design

GEI Consultants

CONSULTANT

- Concept design:
- Anchor-bolts down
- Civil
- Structural
- Marine
- Regulatory Permitting Plan

Eppstein Uhen Architects

CONSULTANT

- Concept Design:
- Anchor-bolts up
- Architectural
- Mechanical
- Electrical
- Plumbing
- Structural

Introduction & Purpose

- The team has developed a Concept Design Package for the Wrangell Shipyard
- The Package and BOD establishes design baseline, fundamental requirements, and assumptions to carry the Owner's vision through design and construction
- The shipyard is primarily intended for vessel repair and maintenance, with facilities strategically configured to enable construction of smaller vessels

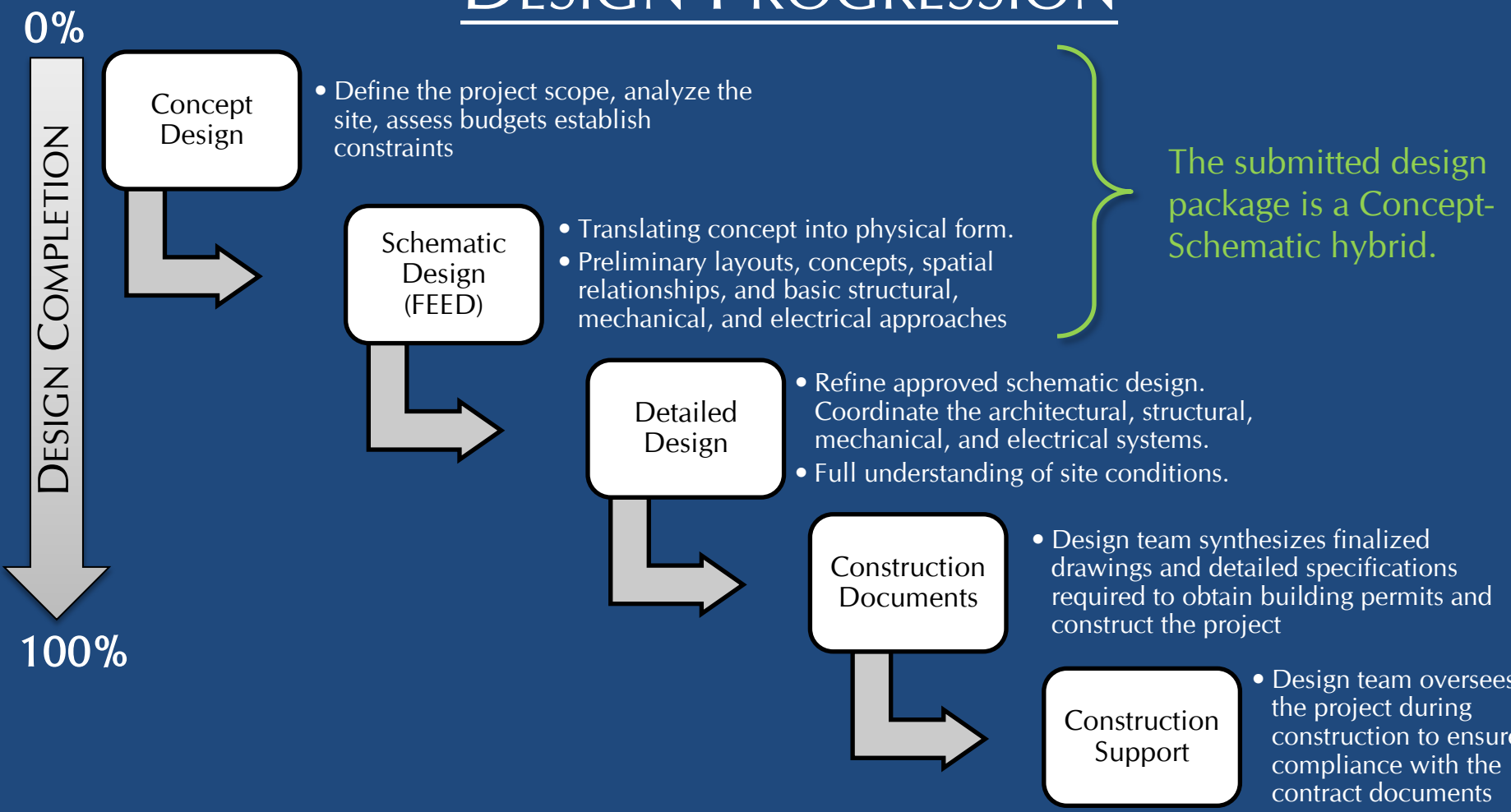
~37,980t
Shiplift maximum lift capacity

580' x 420'
Heavy-duty land level slab

560' x 194' x 258'
Assembly Hall footprint

500
People supported at peak load

Design Progression



Existing Site (Sandbox)

Freight Yard ~4 acres* | **Shipyard ~24 acres*** |

Tideline Construction ~8.7 acres | Lease Area ~3.5 acres*

* Indicates flexibility in lot shape/size.

TARGET VESSEL LIST

- The vessels below have been identified as key vessels for the basis of design

Vessel Owner	Vessel Class / Name	Length (ft)	Beam (ft)	Disp. (long ton)	Loaded Draught (ft)	Height (ft)	Shiplift Capable	Land Level Capable	Facility Capable
USCG	Polar Security Cutter	460	88	22,900*	36	211	Y	Y	Y
USCG	Healy	420	82	16,000	29.3	179.3	Y	Y	Y
USCG	Legend	418	54	4,600	22.5	177.5	Y	Y	Y
USCG	Polar	399	83.5	13,623	31	169	Y	Y	Y
USN	Arleigh Burke (DDG)	510	66	9,700	33	188	Y	Y	Y
USN	Ticonderoga	567	55	9,600	34	179	Y	Y	N**
BC Ferries	Spirit of British Columbia	549.5***	108	11,458	16.5	173.5	Y	Y	Y****
AMHS	Columbia	418	85	7,684	17.5	167.5	Y	Y	Y
NOAA (East)	Ronald H Brown	274	52.5	3,250	17–19	TBD	Y	Y	Y

* PSC is expected to be the heaviest MDL of all target vessels based on Pearlson assumptions and industry knowledge.
** Can technically fit inside Assembly Hall but Aft end of ship will hang out the end
*** Depending on length of blocking requirements, Spirit Class ferry may drive the length of the shiplift
**** Facility length and width may provide operational and logistic challenges to service this vessel inside the Assembly Hall

Project Overview

Shiplift & Piers

Two finger piers to support shiplift system and vessel mooring, transfer bridge, bulkhead, and relieving platform

Assembly Hall

Large controlled-environment building to construct and repair whole-ships, with services and access readily available

Upland Buildings

Steel shop, workshops, offices, and other support facilities for up to 500 people at peak

Land Level Facility

Heavy-duty concrete pad for heavy trestle support. Light-duty pads for SPMT transfer, and light trestle support

Site Infrastructure

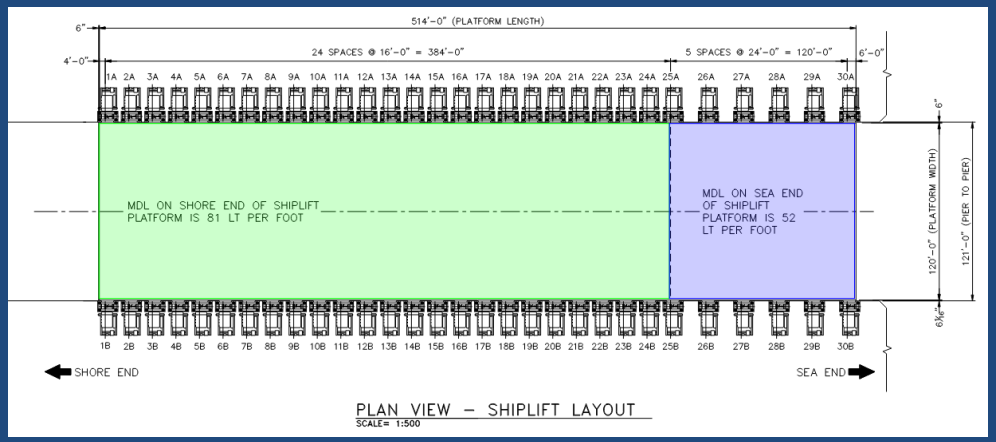
Bulkheads, ground improvements, fuel storage, and wash-down systems

USCG Lease Area

Reserved for USCG operations, hoteling, warehousing, and maintenance

SHIPLIFT OVERVIEW

- Length = 514′ (reduced from 550′)
- Width = 120′
- Max. Lift Capacity = 37,980 lt
- Max. Distributed Load = 81 / 52 lt/ft
- No. Hoists = 60
- Hoist Capacity = 785 lt
- Hoist Spacing = 16 / 24′
- Vertical Travel = 74′
- Transfer Type = Trestle and SPMT
- Trestle Length = 288 / 450′
- Trestle No. = 37 / 76
- MDL on Trestles = 77 / 50 lt/ft



Buildings Overview

A Building A – Blast and Paint Functions

This building combines blasting and painting of 40'x40'x50' (LxWxH) modules in a single bay configuration.

The Blast and Paint facility will contain dedicated HVAC systems, blast and paint process equipment, abrasive recovery, among other systems.

Blast and Paint bay equipment selection, design and engineering is typically completed by experts in blast and paint processes.

11,400 sqft

B Building B – Fabrication and Repair Hall

A single 186,000 footprint building with three different zones / functions. In the center, a single fabrication/repair bay inside clear of 560' length, 142' width and 218' under hook with a pair of 100mT gantry cranes.

A flanking bay for housing a fabrication line. Concept is based on a 40' x 40' horizontal unit.

The second flanking bay houses shops, warehouse, lunchroom, lockers and offices. There are three floors anticipated above grade, each approximately 33,000 square feet

284,000 sqft

C Building C – Control Building

This is a utility and control building to support the shiplift, including spaces to house the electrical and controls equipment.

1,700 sqft

ANIMATION

Review Drawings:
C100, C101, C102, C103, C104, C106, C107, C110, C112S
ALL BUILDINGS (EXCEPT MECHANICAL)
SHIPLIFT LAYOUT

DRAWING REVIEW

Utility Systems Overview

Electrical Distribution

New 25KV-class medium voltage substation feeding the yard; underground distribution via pad-mounted switches and unit substations to structures, berthing, and repair activities.

Fire Protection

Meets NFPA 13/14/20 and MIL-STD-1625E. City water boosted to NAVSEA pressures at ~2,500 gpm; N+1 redundant fire pumps with electrical primary and diesel backup.

Domestic Water

~1,000 ft of new 12" water main from Zimovia Highway. Coordinated with CBW, ADEC Drinking Water Program, and local fire authority; complies with 18 AAC 80.

Sanitary Sewer

Onsite collection, lift stations, and ~1,000 ft of force main to the public system. Industrial wastewater requires characterization/pretreatment approval before discharge.

Compressed Air

Central plant in the repair facility: min. 125 psi, 10,000-12,000 cfm via (6) 450HP compressors, N+1 redundant, serving piers, repair bays, and blast/paint.

Oily Waste & Fuel Polishing

Collection/hold/separation systems for oily waste, plus fuel polishing/recycling with capacity to recycle ~200K gallons of diesel fuel.

Utility Systems Overview

Grading & Drainage

- Conventional system: graded collection, catch basins, storm sewer piping, sediment/oil pretreatment, armored outfalls to the marine receiving water.
- Design storms per NOAA Atlas 14 for Wrangell; 1.25-in (water quality), 10-yr (routine capacity), 25-yr (major conveyance), 100-yr (overflow routing).
- Complies with the Clean Water Act, ADEC APDES, Alaska Construction General Permit, and 18 AAC 70 Water Quality Standards.

Stormwater Treatment

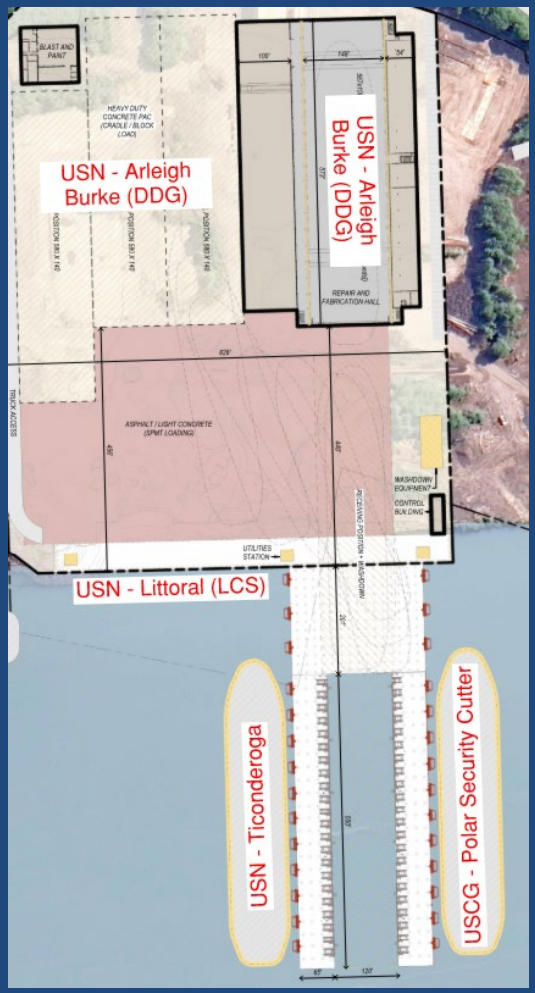
- Treatment for 90% of average-year storms (≤1.25 in rainfall) targeting an 80% reduction in post-development TSS loading.
- Deep-sump catch basins, hydrodynamic/oil-water separators, sediment forebays, and stabilized outlet protection.
- Shipyard operations expected to require the Alaska Multi-Sector General Permit with a facility-specific SWPPP.

Dredging & Geotechnical

- A deep basin is required under the shiplift platform; PND Engineers survey suggests existing mudline elevations are likely sufficient — additional dredging may not be required.
- Dredge maintenance may still be needed once operations begin.
- Geotechnical design parameters are pending a full-scale site investigation.

Berthing Utilities

- The figure to the right displays the “worst-case” vessel based on utility demand at each docking position
- These vessels drive the utility requirements in each area



Utility Demand Overview

Rev 1 Preliminary Utility Demand Calculations

6/12/2026 ***Wrangell Shipyard***

	AREA SQFT	VOLUME CUFT	POWER CAPACITY (KVA)	POWER DIVERSITY (%)	POWER DEMAND (KVA)	PROPANE (MBH)	WATER (GPD)	SEWER (GPD)	Comments \Questions
West Finger Pier (DDG)	0	0	4500	50%	2250	0	9500	9500	Water/Sewer assumes hoteling
East Finger Pier (PSC)	0	0	2500	50%	1250	0	4500	4500	Water/Sewer assumes hoteling. Lacking specs on Polar Max.
Shiplift Control Building	0	0	2500	0%	0	0	0	0	Assumes some dry-dock and berth positions will be evacuated
Commercial Berth	0	0	1500	30%	450	0	2500	2500	Assumes an LCS can be parked at Commercial Berth
Dry Dock Position #1	0	0	3000	50%	1500	0	9500	9500	Water/Sewer assumes hoteling
Dry Dock Position #2	0	0	2500	50%	1250	0	4500	4500	Water/Sewer assumes hoteling
Dry Dock Position #3	0	0	1500	50%	750	0	2500	2500	Water/Sewer assumes hoteling
Repair Hall	92004	20240880	3750	40%	1500	27000	1200	1200	
Steel Shop	43000	2580000	1500	40%	600	4000	0	0	Automation / Panel line equipment needs to be validated
Compressed Air Plant	0	0	2200	75%	1650	0	100	100	Assumes 12000scfm total system (needs to be reviewed)
Washdown*	0	0	500	0%	0	0	24000	0	
Oily Waste / Diesel	0	0	500	30%	150	0	0	0	
Office/Support	86000	1290000	1250	50%	625	8000	7500	7500	
Berthing*					0	0	18000	15000	Will we need to accommodate water and sewer for berthing barges?
Blast and Paint			2500	75%	1875	10000	250	250	
TOTALS			30200		13850	49000	29450	22700	
ANTICIPATED DIVERSITY						80%	35%	40%	Water/Sewer diversities assume 25-30% peak at vessel positions / washdown
ANTICIPATED DEMAND			**30200**		**13850**	**39200**	**29450**	**22700**	

Notes:

* Water usage assumes berthing and filling operations for (2) Navy vessels - could increase peak for day but not regular occurrence

** Water usage ssumes hydroblasting operations - could increase peak for day but not regular occurrence

Peak water demand is 2500gpm

Permitting Summary

- Over 15 permits are required to be submitted to ~8 regulatory agencies
- Generally, 30% Design package is required for submission of these permits
- The longest expected duration of the permits is **18 months** – examples below:
  - Rivers & Harbors Act (RHA) 12-18 mos.
  - National Environmental Policy Act (NEPA) 9-15 mos.
  - Migratory Bird Treaty Act (MBTA) 16 mos.

Budget Review

Description	Estimate (Low Range)	Estimate (High Range)
Design	**$17.8 M**	**$21.3 M**
Equipment	**$145.4 M**	**$174.5 M**
Site	$98.5 M	$118.2 M
South Building (Work shops / Employee Offices)	$0 M	$0 M
Assembly Hall	$10.4 M	$12.5 M
North Building (Steel Shop)	$36.5 M	$43.8 M
Construction	**$441.9 M**	**$530.2 M**
Waterfront	$223.2 M	$267.8 M
Civil & Underground	$85.8 M	$102.9 M
Upland Buildings	$132.9 M	$159.5 M
Total	**$605.0 M**	**$726.0 M**

Totals may not add up due to rounding.

Schedule Review

Design

• Concept – 60% Design	July 2026 – August 2027	13 mos.
– (Above includes ~4 months for acquiring funding)		
• 60% – 100% Design	August 2027 – January 2028	6 mos.
• Permitting	March 2027 – August 2028	18 mos.

Construction - Waterfront

• Bulkhead	August 2028 – February 2029	6 mos.
• Transfer Bridge	February 2029 – June 2029	4 mos.
• Finger Piers	June 2029 – October 2030	16 mos.

Construction - Upland

• Site, LLF, Support Facilities	May 2028 – December 2030	20 mos.
• Blast & Paint	January 2029 – March 2030	14 mos.
• Assembly Hall	January 2029 – June 2031	28 mos.

Value Engineering Opportunities

The following areas have been identified as key considerations for value engineering as the project design progresses and more information becomes available to the design team.

Geotechnical Investigation

Conduct a thorough geotechnical investigation of upland and in-water areas. Design and cost estimates currently rely on conservative assumptions (pile structure, bedrock depth) that may be reduced in future iterations.

Optimize Shiplift Design

Refine the shiplift design and key dimensions (platform length, MDL sections) once vessel information is confirmed. Acquiring vessel specifications and drawings allows optimization to minimize capital expenditure.

Optimize Pier Design

Review the pier design and cost estimate to confirm outer sections are sized for mooring and traffic live loads. The large pier width reduces loading from the shiplift hoists.

Value Engineering Opportunities

Review Vessel List

Target vessel dimensions drive the required size of the shiplift, Land Level Facility, Assembly Hall, and site layout — a major cost driver. Review and refine to balance site capability against capital cost.

Early Contractor Involvement

Engage a General Contractor at 30% (or 60%) design completion to improve constructability and optimize design. Given the remoteness of the site, GC input strengthens the robustness of the design, cost estimate, and schedule.

SPMT vs. Rail Transfer System

Investigate a rail transfer system compared to the proposed SPMT system. The current estimate covers 5 power packs and 26 six-axle modules — sufficient for most vessels (e.g. Arleigh Burke). Lifting the heaviest vessels (e.g. Polar Security Cutter) would require additional rented or purchased units (adding over $50 million)

New Ship Construction vs. Ship Repair

Adding new ship construction capability has increased the project estimate by roughly $60–$75 million, including a blast and paint line, panel line, profile line, larger steel shop, and plate/profile shaping equipment. Review and refine this scope to balance site capability against capital cost.

Next Steps

- **Near Term (weeks)**
  - Provide 60% Design Proposal to Wrangell / JAG – Ongoing
  - Update Animations (to include Wrangell) – Ongoing
  - Support Wrangell / JAG in Presentations and Promotional Campaigns

- **Long Term (months)**
  - Execute 60% Design & Geotechnical Investigations
  - Detailed Review of Value Engineering Items
  - Engage General Contractors