Item No.: 8g_Supp
Meeting Date: December 9, 2025

Pier 91/ Pier 66 Cruise Shore Power Extension Project

Design Authorization for Progressive Design Build Contract

Action Requested

Request Commission authorization for the Executive Director to approve funding to execute a Post-Validation Amendment to the alternative public works Progressive Design Build contract, MC-0322060, for the T91/P66 Cruise Shore Power Extension (C801983) project to further advance design and complete the development and negotiation of a Guaranteed Maximum Price. Total requested for this action is $5,000,000 for a total project authorization of $15,450,000.

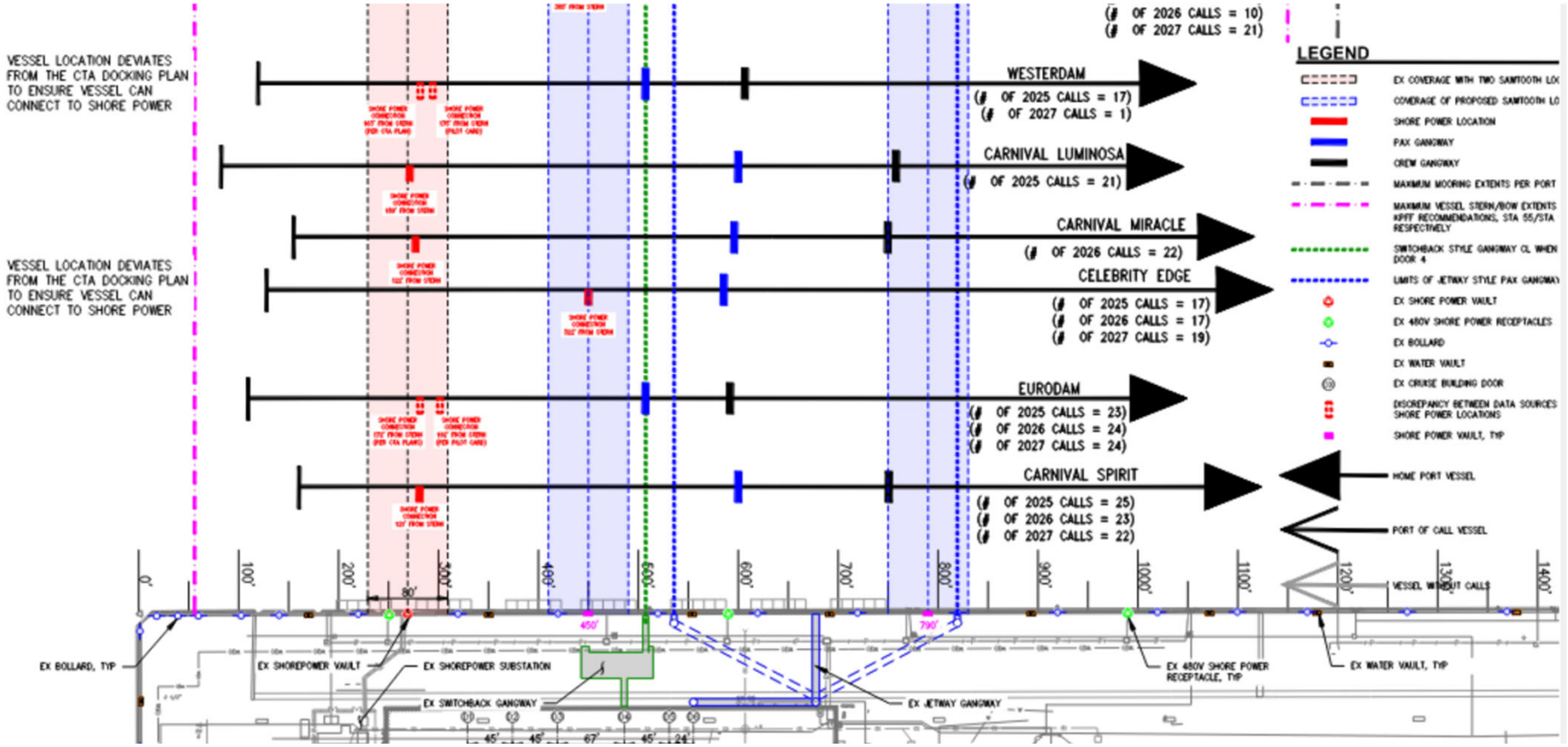
Project Purpose

- **In July 2024, Commission Order No. 2024-08 was passed mandating that all homeport cruise ships connect to shore power by 2027.**
- To meet the mandate, the existing shore power systems need to be extended at Pier 91 and Pier 66.
  - Currently, the shore power cables cannot reach from the berth connection point to plug-in locations on all shore power capable ships.
- This project will provide maximum flexibility in how ships with different shore power configurations berth at the pier so they can connect to shore power.

Details

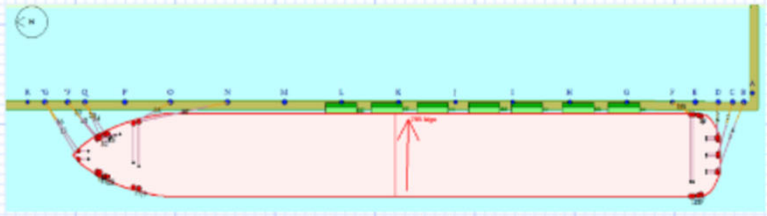
- Skanska USA Building Inc. (Skanska) has completed the Validation Period for both Pier 66 and Pier 91 shore power extension projects.
- A robust berthing study and mooring analysis was conducted at both piers to determine the optimal shore power connection locations and quantity
- Alternative shore power pathway routing options were analyzed

Example Terminal 91 Berthing Analysis



Example Terminal 91 Mooring Analysis

T91W - Quantum - 40% Pretension



8 lines bow, 8 lines stern

ARRANGEMENT PLAN

35 knt Wind at 45° True | 0.0 ft Sig Wave Height | 0.0 ft Sig Swell Height | Ref: 1700263 T91 Mooring
35 knt Current 270° True | Period 6.0 secs at 90° | Period 2.0 secs at 160° | Analysis for Time: 0700 Mar 01 2007
Movement of Vessel at its Sebd Target: 2.10 (fwd) 0.78 (fwd) | 0.70 (astv) 1.70 (astv) | 0.1° (port) -0.1° (stbd) | 0.00 (up) 0.00 (up) | Water Level 11.36 ft steady | Bottom Clearance 18.5 ft | Draft: 27.9 ft | Trim: 0.0 ft | 0.1 Disequilibrium after 73 iterations

Line	1	2	3	4	5	6	13	14	15	16	18	20	22	24	28	30
to Bollard/Hook	C	C	B	B	D	D	F	F	'G	'G	'F	'F	Q	Q	O	N
Pull-In (ft)	2.95	2.91	3.10	3.13	2.82	2.76	3.67	3.64	3.50	3.37	3.16	3.16	2.96	3.01	2.31	2.58
Total Line Length	111.2	107.5	138.6	141.5	80.3	75.4	140.7	145.9	129.2	119.0	104.7	108.2	96.7	95.0	142.1	231.6
Inline Motion (±)																
Winch Slippage																
Wave Direction	130°	130°	130°	130°	130°	130°	330°	330°	50°	50°	50°	50°	50°	50°	50°	50°
Tendon (kips)	133S	135S	132S	132S	123S	125S	100S	99.5S	131S	125S	116S	113S	136S	124S	181S	146S
% of Strength	41%	42%	41%	41%	38%	39%	31%	31%	41%	39%	36%	35%	42%	38%	56%	45%

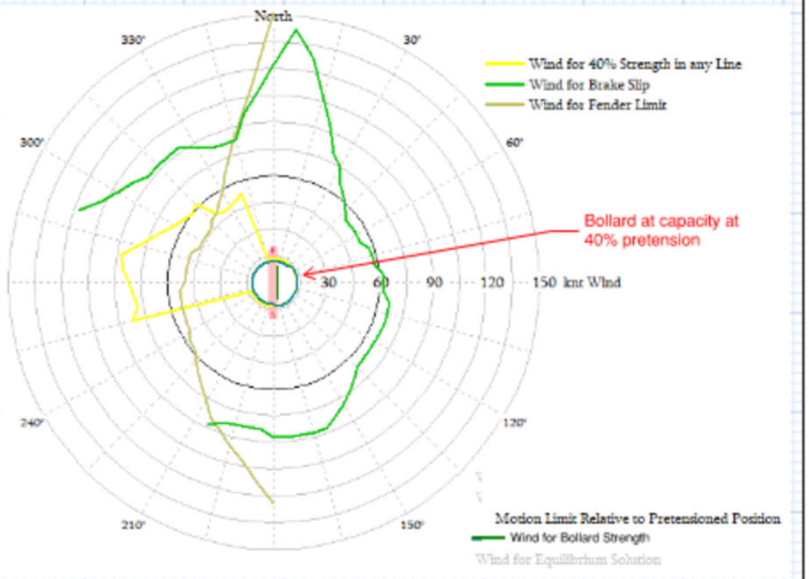
Auto-Calculation

Fender	aa	bb	cc	dd	ee	ff	gg
Thrust (kips)	51	259	260	262	271	279	287
Compression (ft)	0.30	1.70	1.70	1.73	1.81	1.89	1.96
Pressure (kips/ft²)	0.3	1.0	1.0	1.0	1.1	1.1	1.1

Bollard/Hook	B	C	D	F	N	O	Q	T	'G
X-Force (kips)	-102.6	-78.5	-12.4	167.5	-139.7	-147.0	105.4	133.4	133.8
Y-Force (kips)	242.2	253.9	244.3	94.2	29.2	78.0	195.9	159.3	204.6
Other X-Load									
Other Y-Load									
Total Force	264.0	267.7	248.7	199.9	145.7	181.5	258.5	229.4	256.4
% Bollard Strength	120%	121%	113%	181%	66%	82%	117%	104%	117%
Direction in Plan	-23°	-17°	-3°	61°	-78°	-62°	28°	40°	33°
Bollard Uplift	23.3	32.1	45.0	54.8	29.2	72.3	131.7	97.1	77.1

MOORING RESULTS TABLES

Analysis for Time: 0700 Mar 01 2007 (initialised at 0700 Mar 01 2007)
Ref: 1700263 T91 Mooring
Remarks: Remarks:
Water Level: 11.36 above datum
Draft: 27.9
Trim: 0.0



WIND CAPACITY ROSE

kpff — 1601 Fifth Avenue, Seattle, WA 98101 — kpff.com

POS T91 CRUISE SHORE POWER

40% PRETENSION OPTIMOOR RESULTS SUMMARY AT T91W - QUANTUM

PROJECT NO. 250049 | DATE 10/29/2025 | BY CH | REFERENCE SHEET | SKETCH NO. 1

Shore Power Routing Options Considered

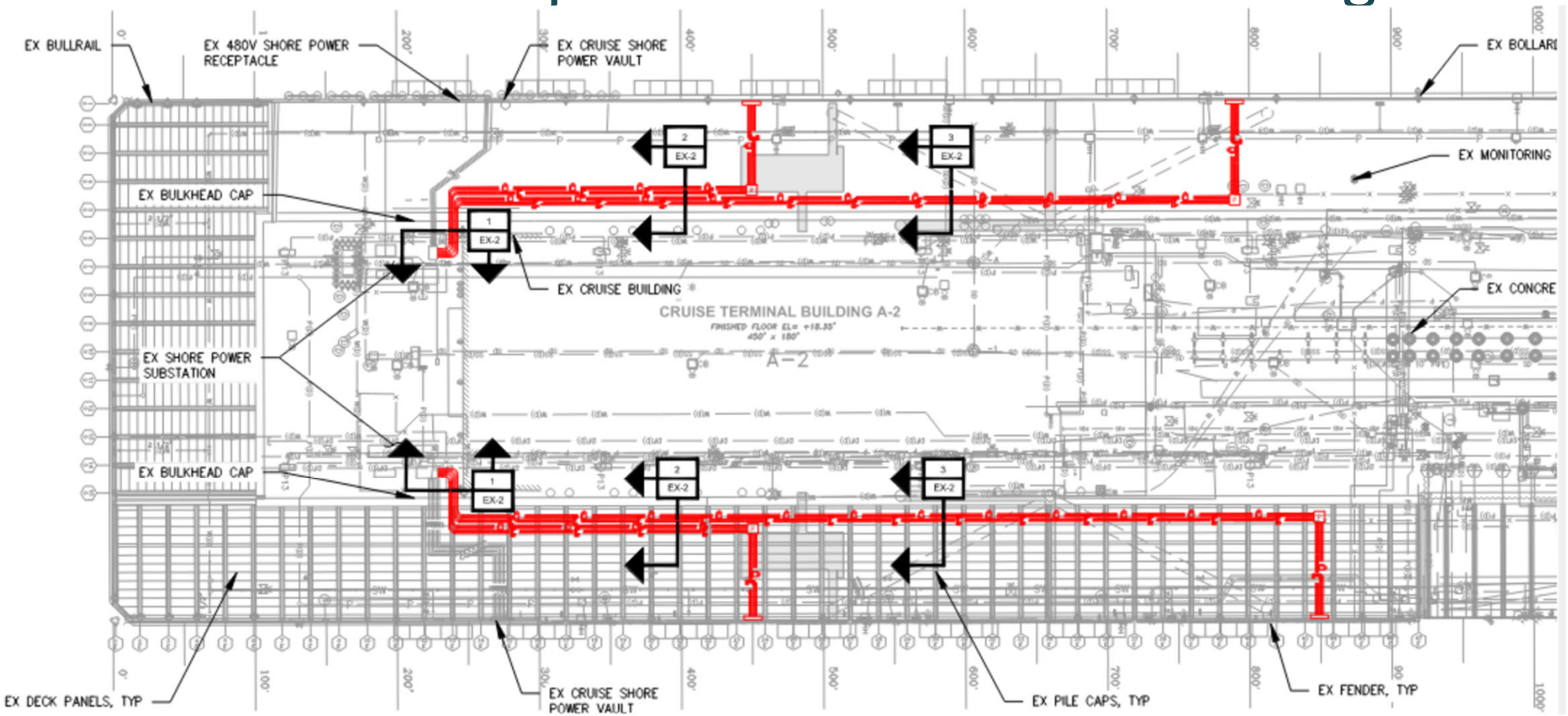
Pier 66

- Adding a new conduit to existing conduit hangers
- Routing the conduit along the east face of the pier
- Penetrating the wave barrier wall to route the conduit from the south to north end of the pier
- Routing the conduit along the west side of the pier and utilizing the existing openings on the west side of the wave wall to pass through

Pier 91

- Through the ballast on the wharf
- Through the bulkhead wall and then below the wharf, utilizing conduit hangers anchored to the underside of the pier
- Through or over the existing cruise building
- Underneath the existing cruise building via horizontal directional drilling (HDD)
- Through the upland area between the existing bulkhead cap and cruise building, which ranges from approximately 5 to 10 feet in width

Pier 91 Proposed Shore Power Routing



Pier 91 Recommendation

- **Advance Design and GMP development for the full scope of the shore power extension project at both P91.**
  - The conduit route through the ballast on the wharf was identified as the optimal solution.
    - This approach was selected based on:
      - Cost efficiency,
      - Straightforward construction process
      - Absence of in-water permitting requirements
      - Minimal risk of encountering unforeseen subsurface features
  - (2) new sawtooth boxes are recommended on the west berth at footmark 450’ and 790’
  - (2) new shore power connection points are recommended on east berths at footmark 450’ and 849’
  - Replacement of the existing sawtooth boxes on the east and west berths are recommended to modernize the equipment and allow for maximum flexibility in the use of the mobile cable positioning devices (CPD).
  - (2) new 100-ton bollards near the 1,200’ footmark of the west berth

Pier 66 Recommendation

- **Advance Design and GMP development for the shore power extension project at P66.**
  - The current system is sufficient for all current and scheduled vessels through 2027. An additional sawtooth box would allow for ships that may call in the future.
  - (1) new shore power connection point is recommended at either footmark 793’ or 372’
  - More analysis is necessary at P66 due to potential issues with fixed gangway Bertha and a determination will be made during Design phase if it should be advanced to construction.
  - When design has progressed to between 60% and 90%, a decision will be made to either advance or remove the P66 scope from the project based on the cost benefit of adding a new connection point at this time.

Cost Breakdown and Target GMP

Cost Element	Design and GMP Develop. Authorization	Total Cost
Planning through Validation	**$0**	**$2,450,000**
Pier 91	$0	$1,620,000
Pier 66	$0	$830,000
Design	**$5,000,000**	**$5,000,000**
Pier 91	$3,800,000	$3,800,000
Pier 66	$1,200,000	$1,200,000
Material Pre-Procurements (Watts)	**$0**	**$8,000,0000**
Pier 91	$0	$7,000,000
Pier 66	$0	$1,000,000
Construction	**$0**	**$33,215,000**
Pier 91	$0	$10,600,000
Pier 66	$0	$7,600,000
Target Guaranteed Maximum Price (GMP)		**$48,665,000**

Project Schedule

Phases	Anticipated Dates
Commission Authorization – T91 Mobile Cable Positioning Devices (CPDs) and T91 Cruise Shore Power Extension North initial design funding	August 8, 2023
DORA – Progressive Design Build Procurement and Preliminary Design	October 16, 2024
Commission Authorization – Watts Marine, LLC Purchasing Contract	April 22, 2025
Commission Authorization - Progressive Design Build Contract – Validation Phase	July 8, 2025
Progressive Design Build Validation Period Execution	August 22, 2025
Commission Authorization – Post-Validation Amendment funding	December 9, 2025
Commission Authorization – GMP Amendment funding	Q2 2026

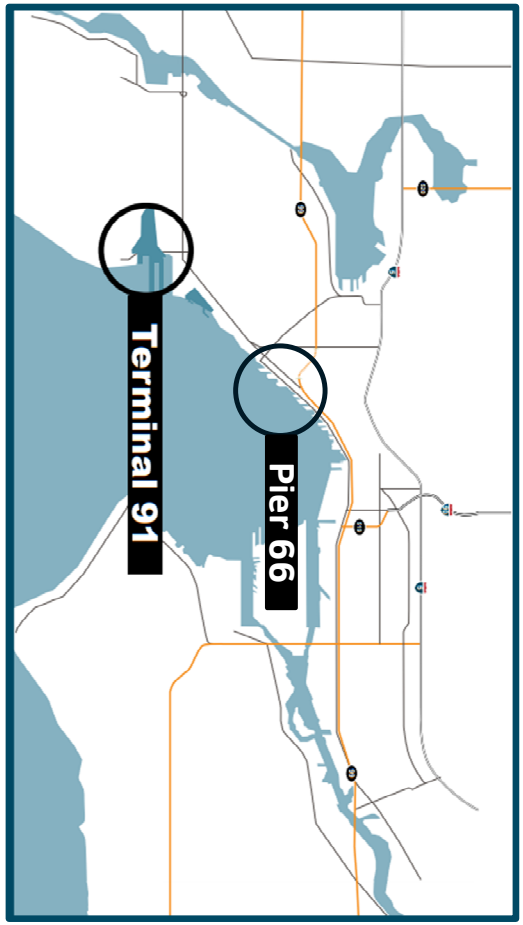
Next Steps

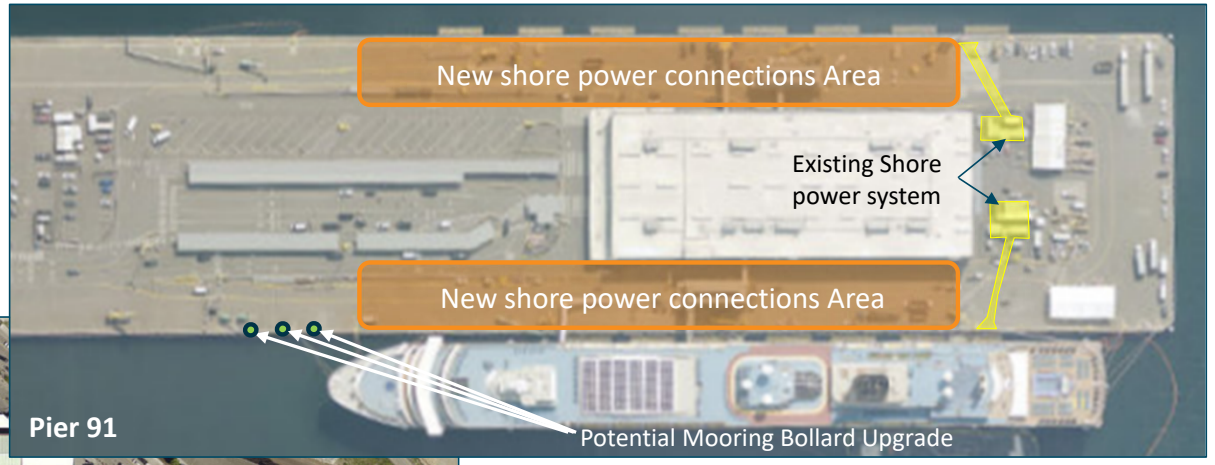
- Design development and final GMP development Q4 2025 - Q2 2026
  - Decision to advance or remove P66 scope will occur between 60% and 90% design
- Commission Authorization Final design/Construction Q2 2026
  - Final GMP, scope, schedule
- Construction Q4 2026 – Q2 2027

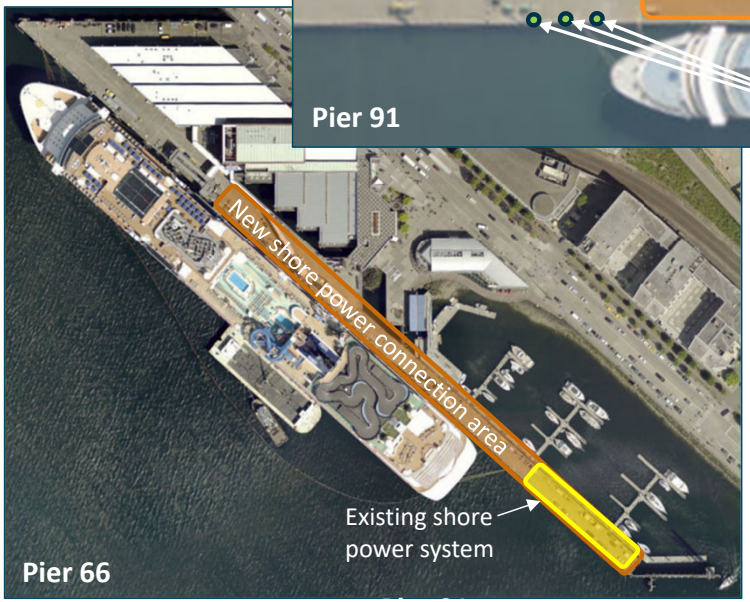

Questions?

Appendix

Project Areas – Pier 91/Pier 66







Project Scope

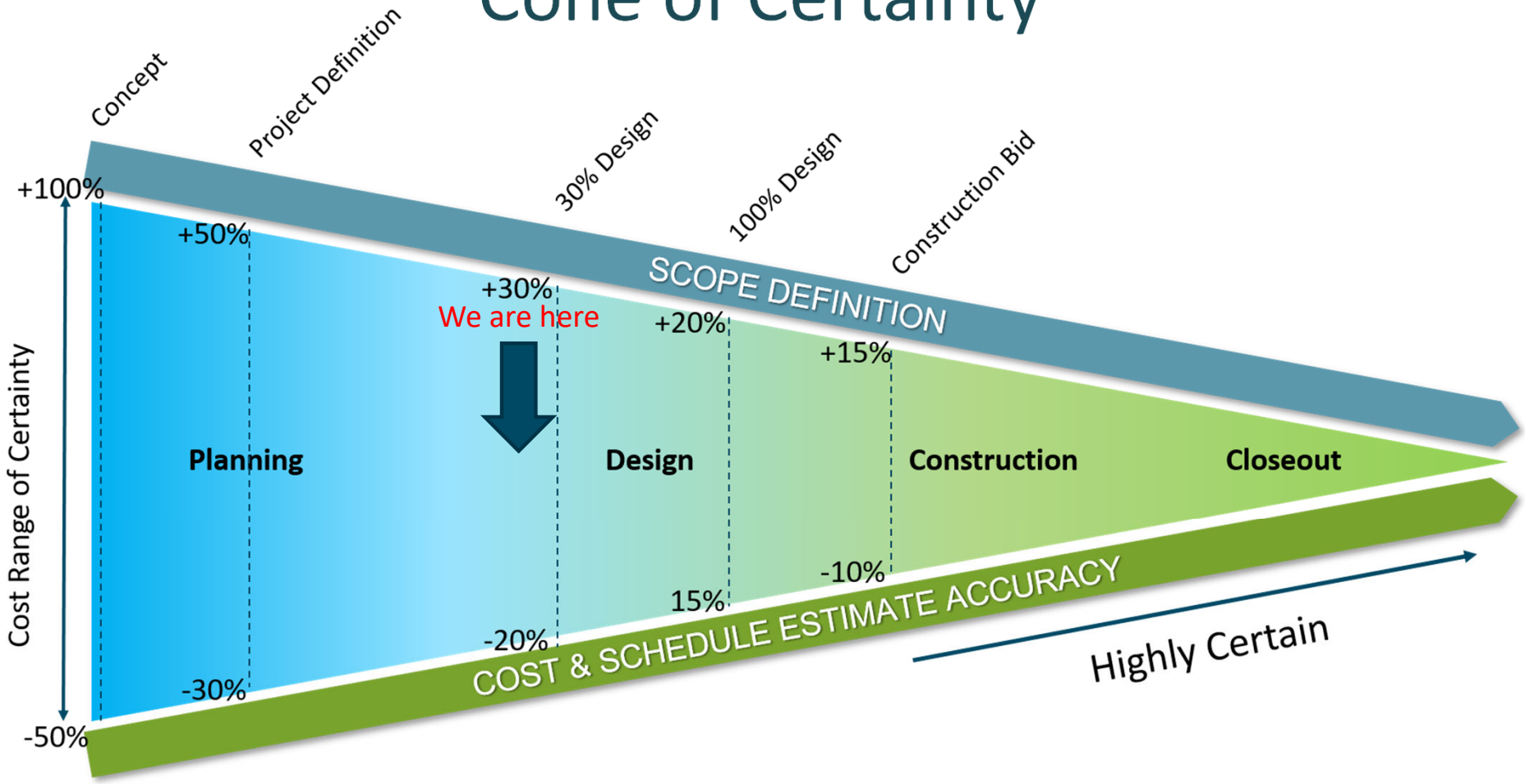
- Design and construct all necessary infrastructure upgrades to (2) Pier 91 cruise berths and Pier 66 cruise berth to meet project goals, including :
  - Conduct a berthing and mooring study for all known current and future ships to determine optimal connection locations, distribution pathways, and required mooring bollard upgrades.
  - Extend the existing shore-power system to allow all known current and future ships of different configurations to connect to shore-power
  - Ensure compatibility of the extended cruise shore power system with existing equipment and facilities, including the mobile cable positioning devices (CPD).
  - Procure all permits
  - Replacement of existing shore power equipment that has reached end of service life at Pier 91.
  - New mooring bollards at Pier 91
  - Potential limited deck panel replacements at Pier 91

Project Funding

Cost Estimate/Authorization Summary	Capital	Expense	Total
COST ESTIMATE			
Original estimate	$4,000,000	$0	**$4,000,000**
Previous changes – Net*	$44,665,000	0	**$44,665,000**
Revised estimate	$48,665,000	0	**$48,665,000**
AUTHORIZATION			
Previous authorizations	**$10,450,000**	**0**	**$10,450,000**
• Terminal 91	$1,620,000		$1,620,000
• Pier 66	$830,000		$830,000
• Watts Marine Sole Source Contract	$8,000,000		$8,000,000
Current request for authorization	**$5,000,000**	**0**	**$5,000,000**
• Terminal 91	$3,620,000	0	$3,620,000
• Pier 66	$1,380,000	0	$1,380,000
Total authorizations, including this request	**$15,450,000**	**0**	**$15,450,000**
• Pier 91	$1,620,000		$1,620,000
• Pier 66	$830,000		$830,000
• Watts Marine Sole Source Contract	$8,000,000		$8,000,000
Remaining amount to be authorized	**$33,215,000**	**$0**	**$33,215,000**

* The original estimate for this project assumed a single new shore power connection point on the west berth of Pier 91. In July 2024, Commission Order No. 2024-008 was passed requiring all homeport cruise ships to connect to shore power by 2027. To meet the mandate of this order, scope for this project was expanded to include multiple additional connection points on both the east and west berths of Pier 91, as well as adding a third connection point to the existing shore power system at Pier 66.

Cone of Certainty



RISKS	DESCRIPTION	PROBABILITY	IMPACT	MITIGATION
Constrained Schedule	Delivery required by 2027. Minimal work windows due to cruise season, commercial fishing season, tribal agreements, and fish window if in-water work is needed have high potential to delay in-service date past cruise season start in 2027.	High	High	Utilize Progressive Design Build project delivery to accelerate timeline. Pre-purchase of long-lead items.
Seattle City Light Terminal 91 Operations Agreement	Existing operations agreement between cruise lines and SCL does not account for increased connections during peak power usage times during the week. Negotiation of new agreement when Port takes ownership of the shore power equipment may result in higher usage costs, and interruptions in power delivery during the week.	Med	High	Early engagement with SCL to do system impact study and begin negotiation of agreement terms for power delivery.
Supply chain uncertainty	Supply chain logistics could delay project delivery. Tariffs could impact ability to procure long-lead electrical equipment by 2027 and create uncertainty in pricing.	Med	High	Adding cost contingencies to account for tariff price impacts. Early execution of Watts contract to begin procurement of long-lead shore power equipment in advance.
Ownership of the existing cruise shore power system at T91	Ownership is still held by Carnival Cruise. Logistics of ownership transfer could drive up project costs.	Med	Low	Cruise Operations is in negotiation to transfer ownership to the Port.
Coordination with other projects at Terminal 91	There are many other projects scheduled on Pier 91 with similar timelines to the cruise shore power project: gangways, water line replacement, dock rehabilitation, west berth dredging.	High	Med	Identification of all on-going and upcoming construction work at Terminal 91. Requirement of logistics plan by PDB to account for constraints of other projects.
Permitting	Permitting assumptions are aggressive and assume no in-water work. This could change depending on how the contractor must construct the project. In-water work, or any other permitting delays will delay the project.	High	High	Progressive Design Build project delivery will allow for early collaboration on design and permitting to the extent feasible.