



# Haines Borough Lutak Dock Design and Development Concepts February 1, 2017

Brad Ryan – Interim Borough Manager

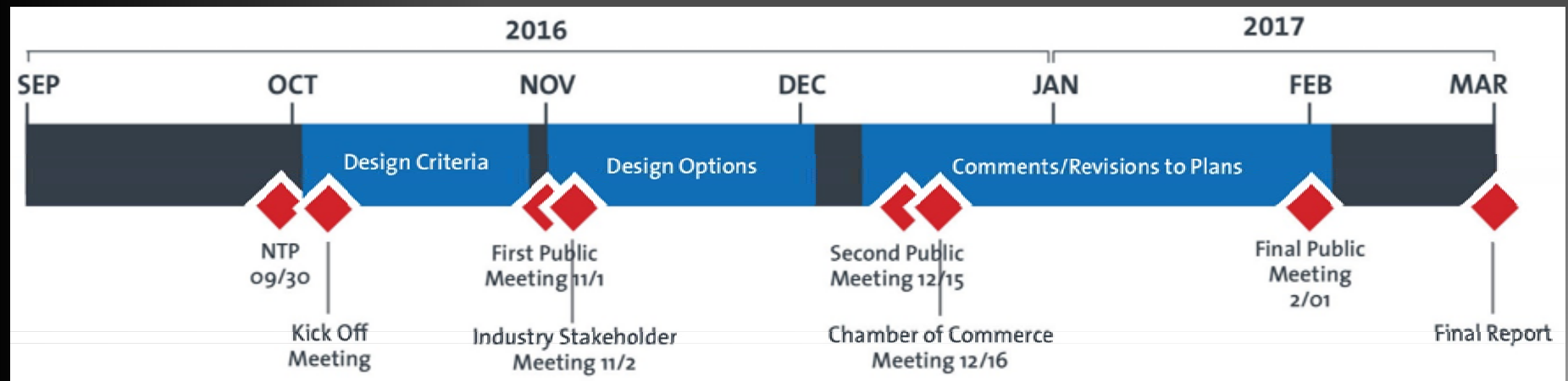
Shawn Bell – Acting Director of Public Works/Harbormaster

Van Le, AICP – R&M Planning Lead

John Daley, P.E. – R&M Project Manager

[www.LutakDock.com](http://www.LutakDock.com)

# Schedule





# Project Purpose and Need

- All freight and fuel for Haines comes over Lutak Dock.





# Project Purpose and Need

- Long series of local failures and reports documenting the condition of the dock.
- 2014 report by PND Engineers, Inc. "the structure has reached the end of credible 60-year service life. Further utilization is effectively on borrowed time."
- 2014 Echelon Engineering reported an average section loss of 37% on the main cells with a maximum section loss of 65%.
- According to the ASCE Manual of Practice 130 "*Waterfront Facilities Inspection and Assessment*" this type of section loss can be considered to represent "major" and "severe" damage.





# Project Purpose and Need



Sink holes and loss of fill



Corrosion failure closure arc (PND Engineers)



# Project Purpose and Need

- If (when?) the dock fails the fuel and cargo for Haines will be forced to come over the Highway.
- 2016 Northern Economics reports: "The increase in transportation costs is expected to impact the cost of goods and services in Haines for both consumer and industrial end users."
- 2016 Northern Economics reports: "Based on national transportation statistics, the average freight revenue per ton-mile for freight moved by truck is over seven times as much as the average freight revenue per ton-mile for freight moved by barge."



# Project Purpose and Need





# Project Progress

- Preliminary engineering and evaluation complete.
- Preliminary cost estimates complete.
- Original direction / ideas included three alternatives:
  1. Encapsulation; New sheet pile wall outside of the existing cells
  2. Replace in kind with earth filled bulkhead
  3. Pile supported dock with sheet pile abutment





# Project Progress

- Combi-wall encapsulation not economically feasible. Height requires multiple levels of tie backs.
- Modified diaphragm encapsulation feasible and economic.
- Berthing dolphins economic and feasible
- New three alternatives:
  1. Encapsulation of the existing cells with modified diaphragm
  2. Pile supported dock with sheet pile abutment
  3. Berthing dolphins



# Project Progress

- Mining operation support considered
- FASTLANE grant application support provided
- Engineering recommendations provided



# Existing Site



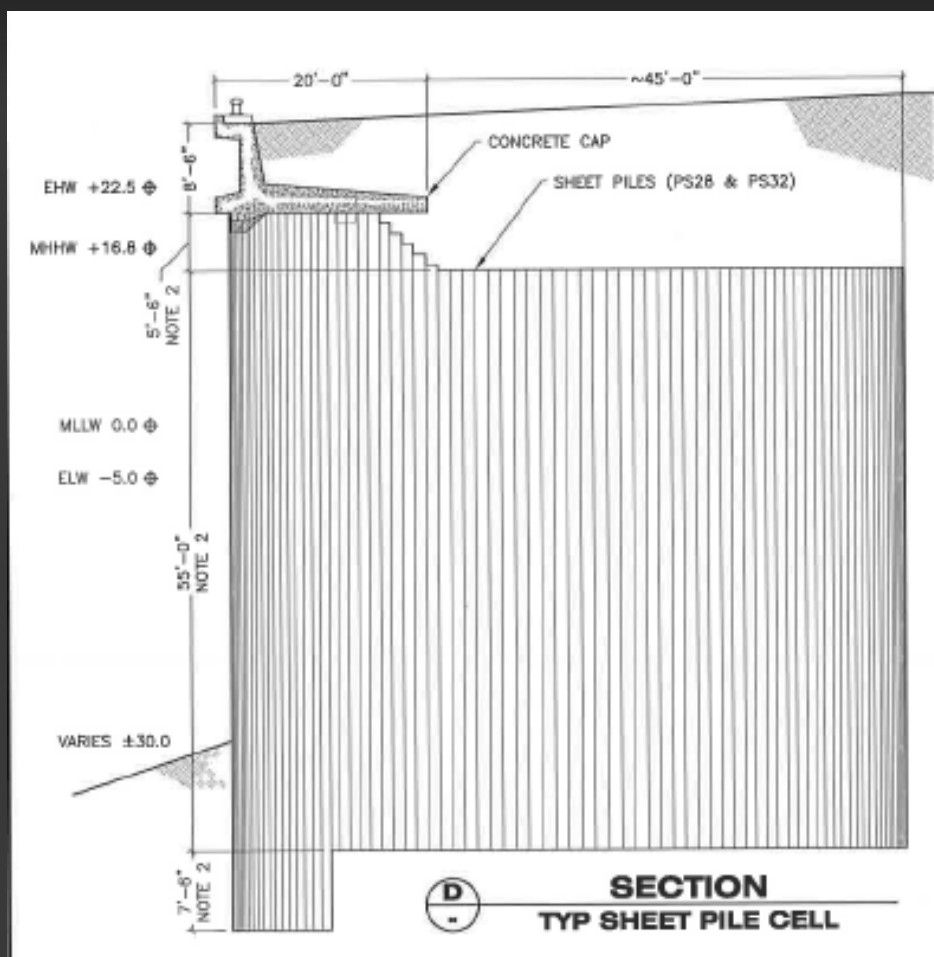








# Existing Site



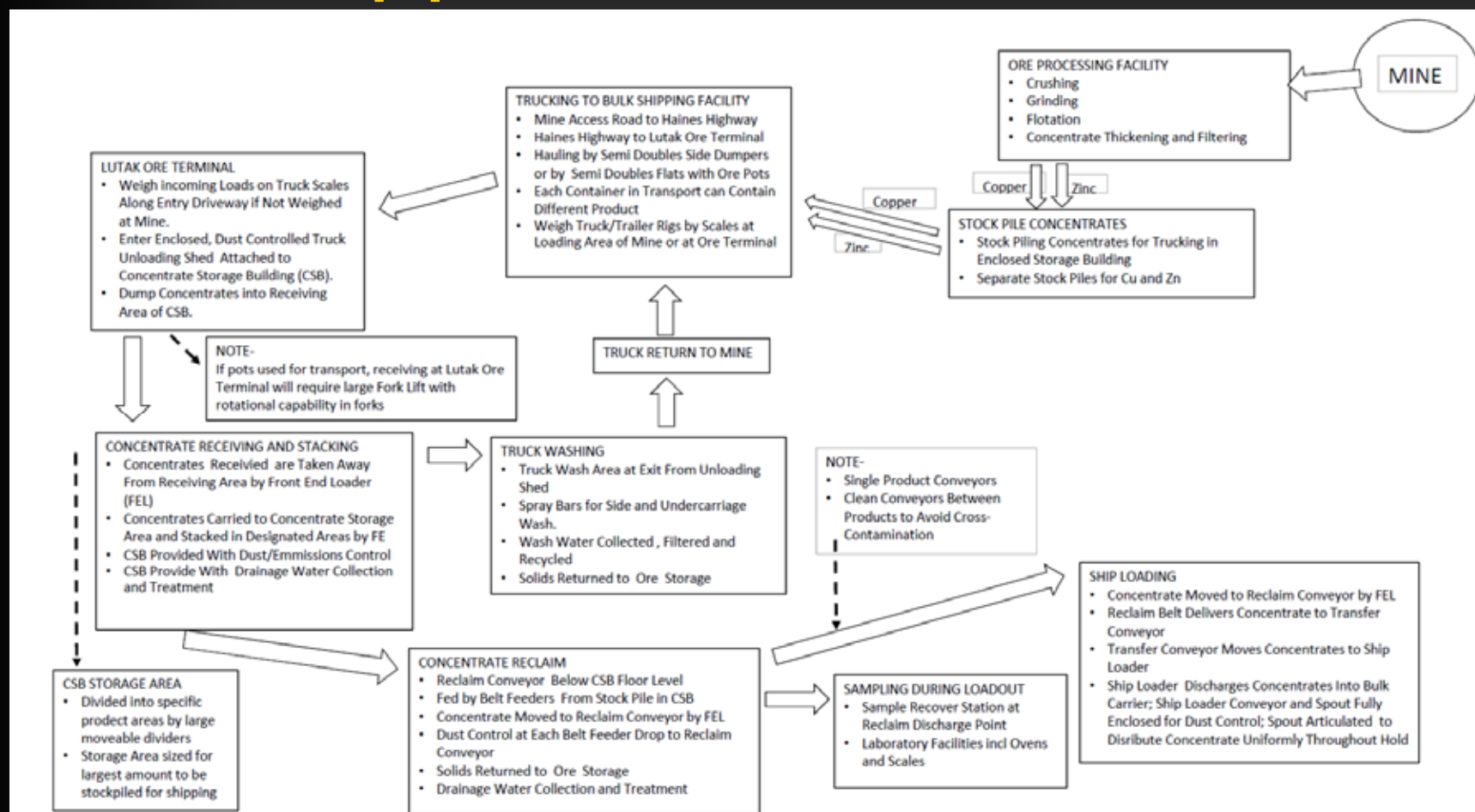


# Mine Support

- Hypothetical development of the Palmer Mine.
- The export site requires a concentrate storage building and related facilities. This could take up 7-10 acres.
- Existing dock is about 4 acres.
- Ship loader and berth need for Handimax size vessel

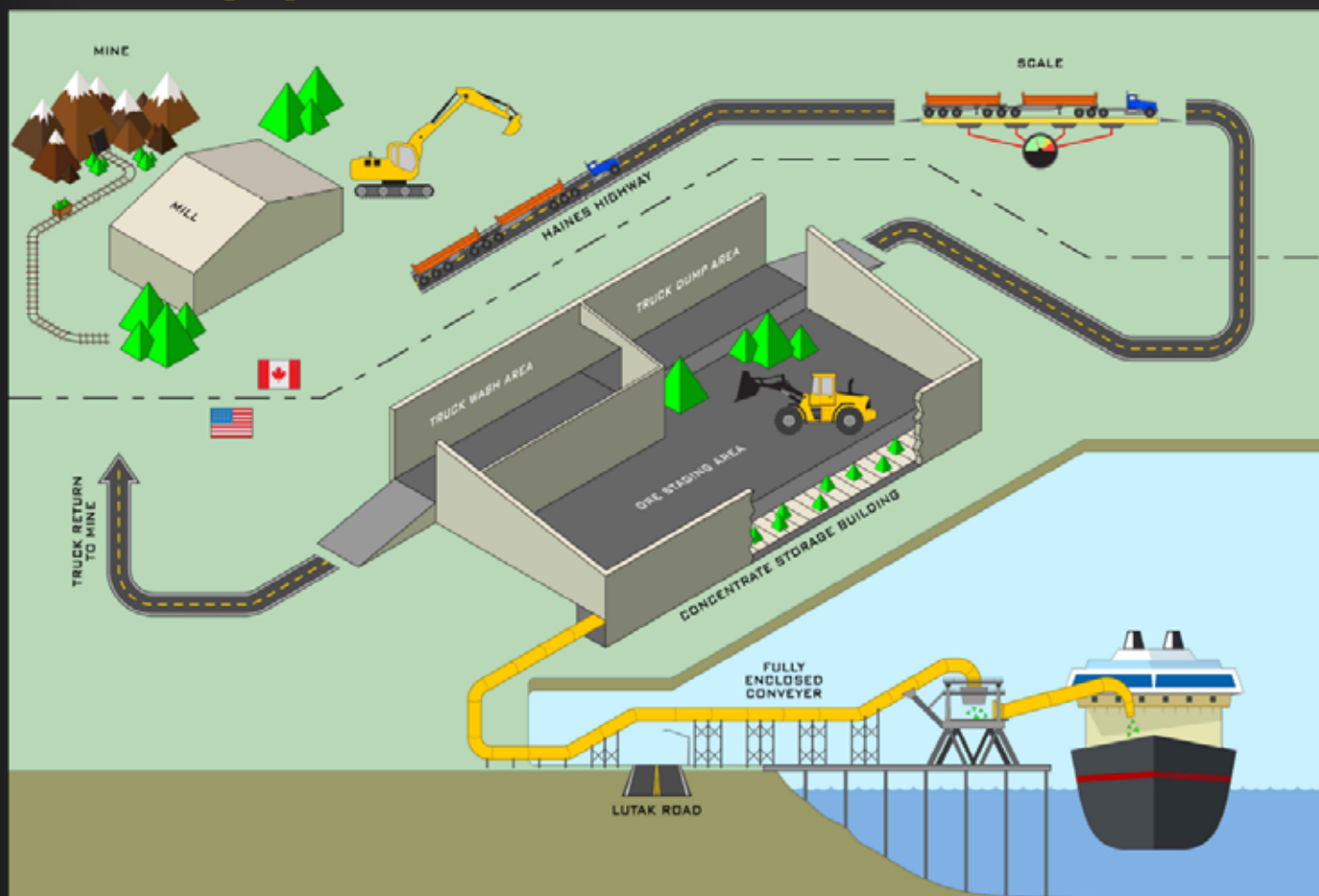


# Mine Support





# Mine Support





# Mine Support



Table 1 Key Dimensions of Design Ships

Dimensions	Ship Size (dwt)		
	12,000	35,000	45,000
Length Overall (ft)	426	625	722
Beam (ft)	66	88	100
Moulded Depth (ft)	37	50	58
Loaded Draft (ft)	27	34	42
Number of Hatches	4	6	6
Hatch coverage length (ft)	308	446	518





# Mine Support





# Mine Support Summary

- Concentrate Storage Building requires 7 to 10 acres and may be better suited at old US Army POL site.
- Handimax vessels could be berthed at Lutak Dock. Ship loader and dolphins would be required.
- Lutak Dock could support general cargo for a mining operation.



# Alternatives

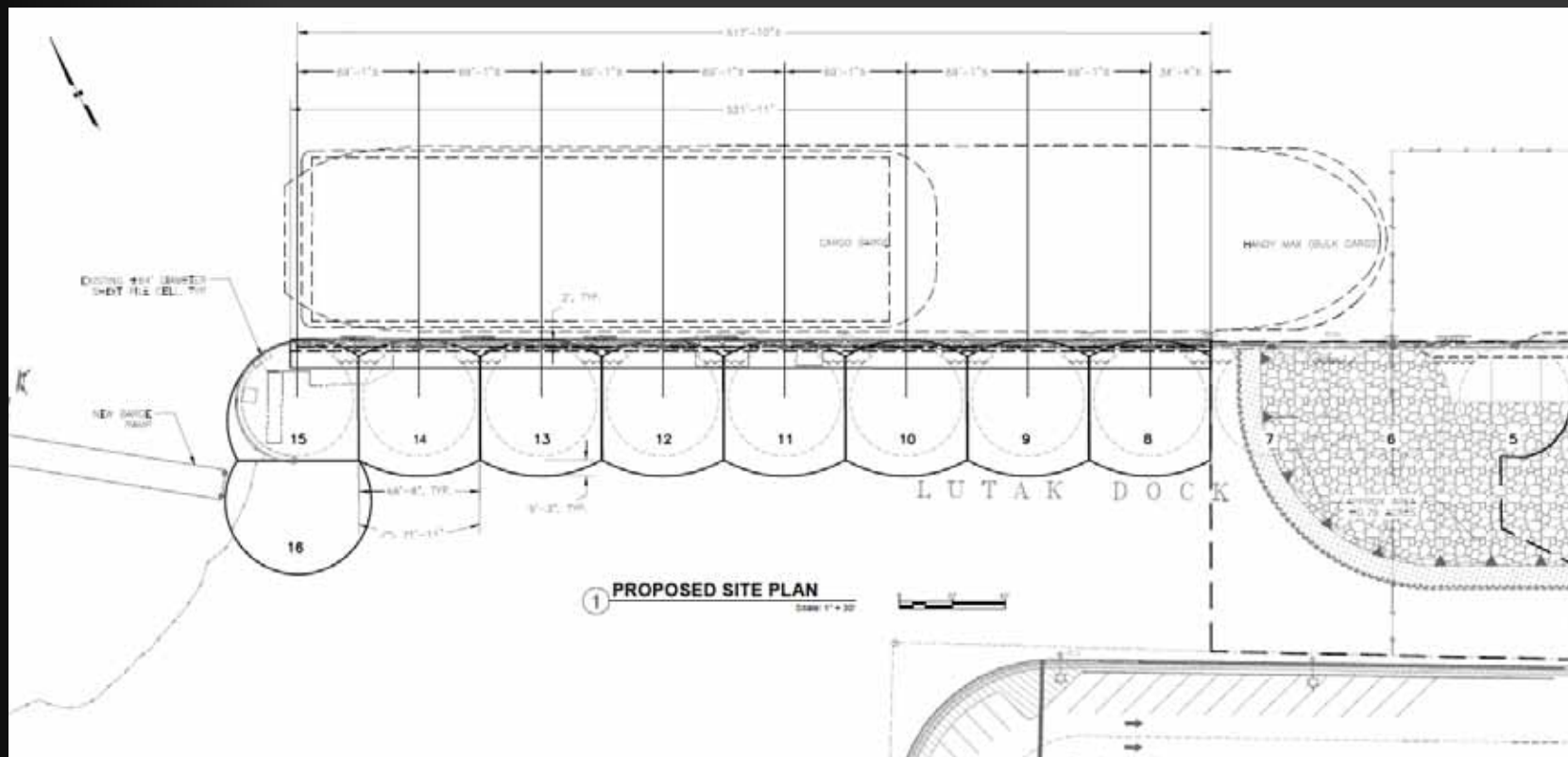
- 1A and 1B Encapsulate with Modified Diaphragm
- 2 Pile Supported Platform Dock
- 3A and 3B Berthing Dolphins and Transfer Bridge







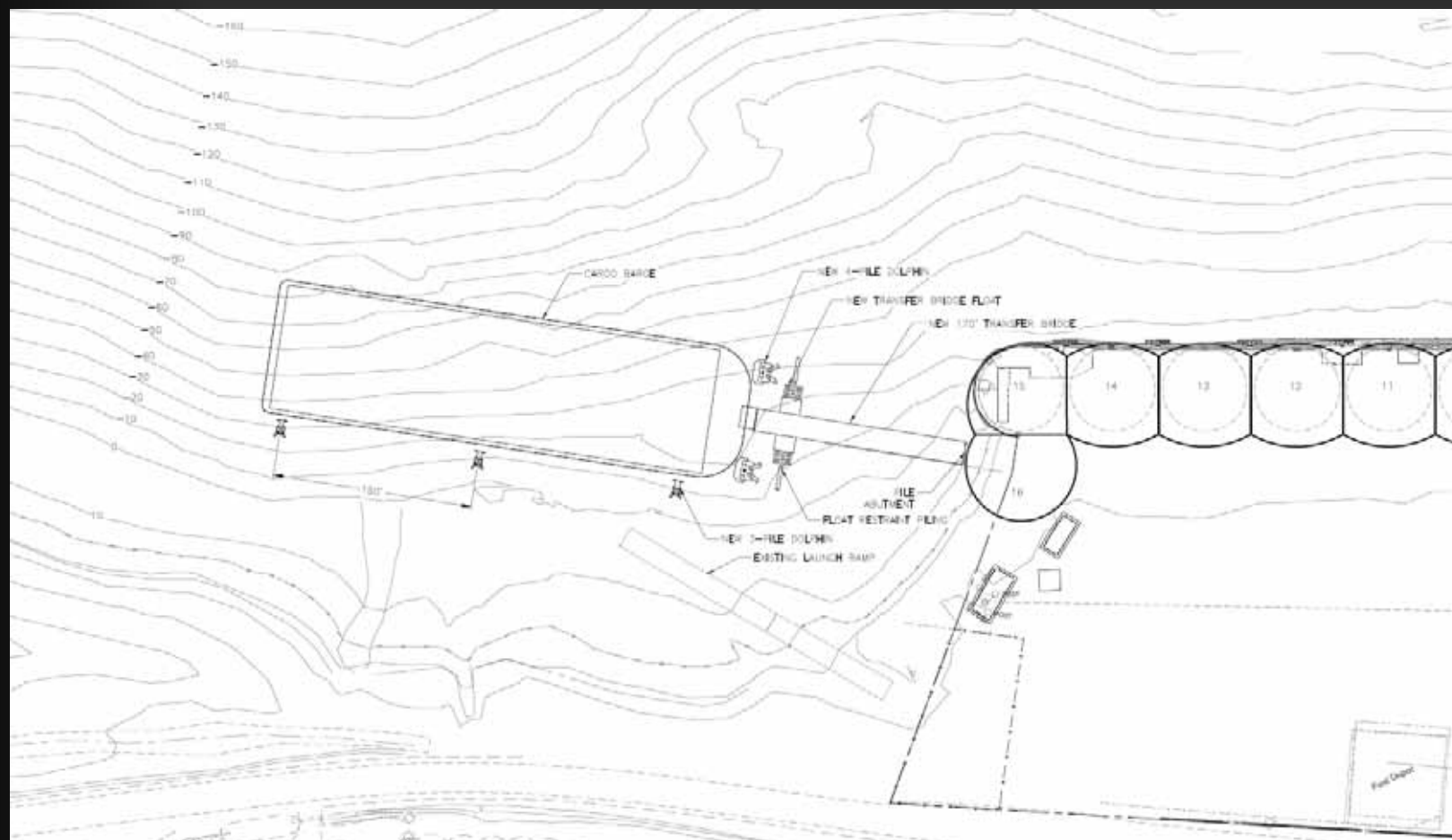
# Design Option 1B Encapsulation







# Design Option 1 Encapsulation







# Design Option 1 Encapsulation

- Pros:
  - Efficient and cost effective.
  - Maintains existing footprint.
  - Accommodates existing and multipurpose users.
  - 1A reclaims about ½ acre.
- Cons:
  - Pile driving risk during construction.
  - Existing cell and poor quality fill remain.



# Design Option 1 Encapsulation

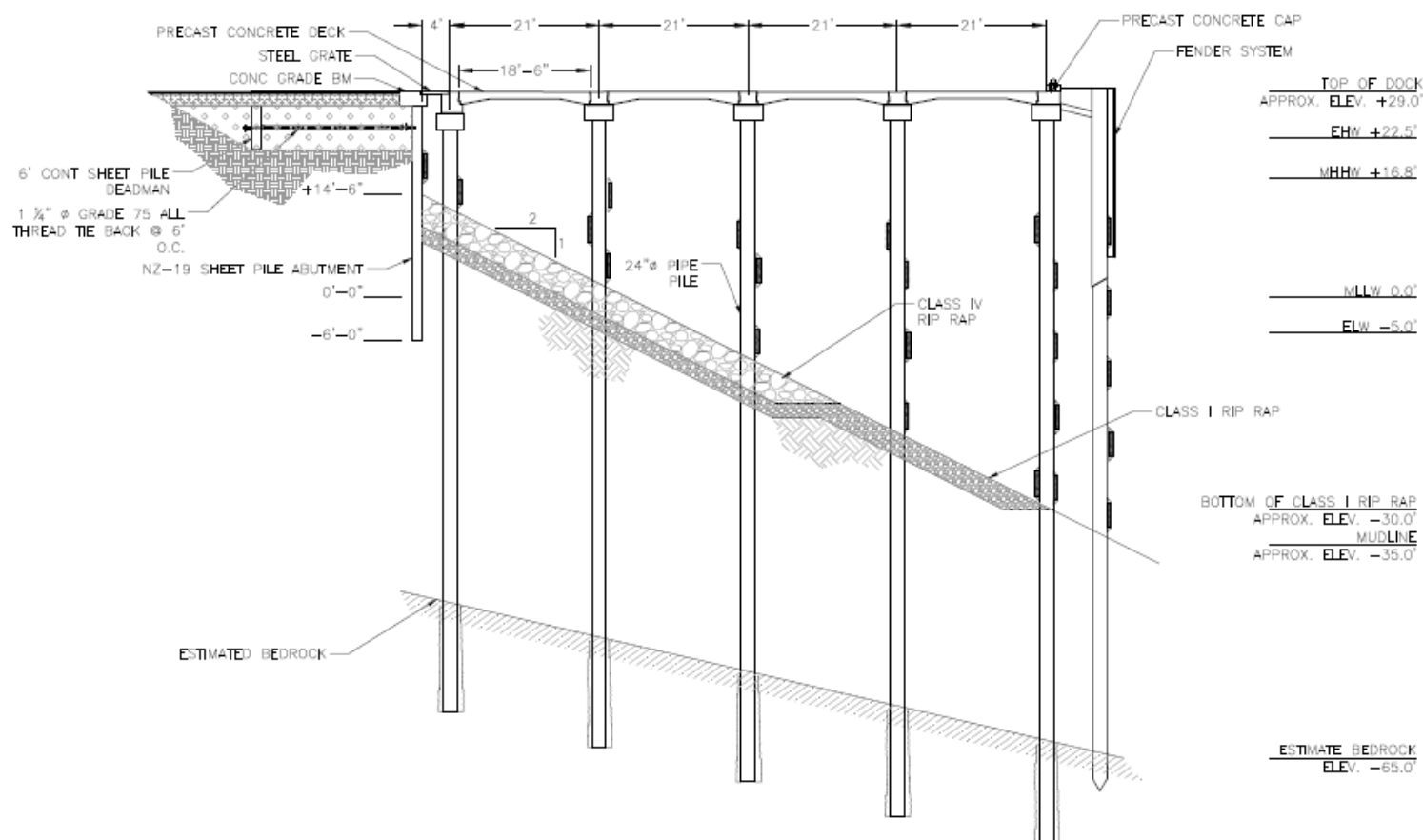
- 1A \$37,300,000
- 1B \$31,900,000

# Design Option 2 Platform Dock





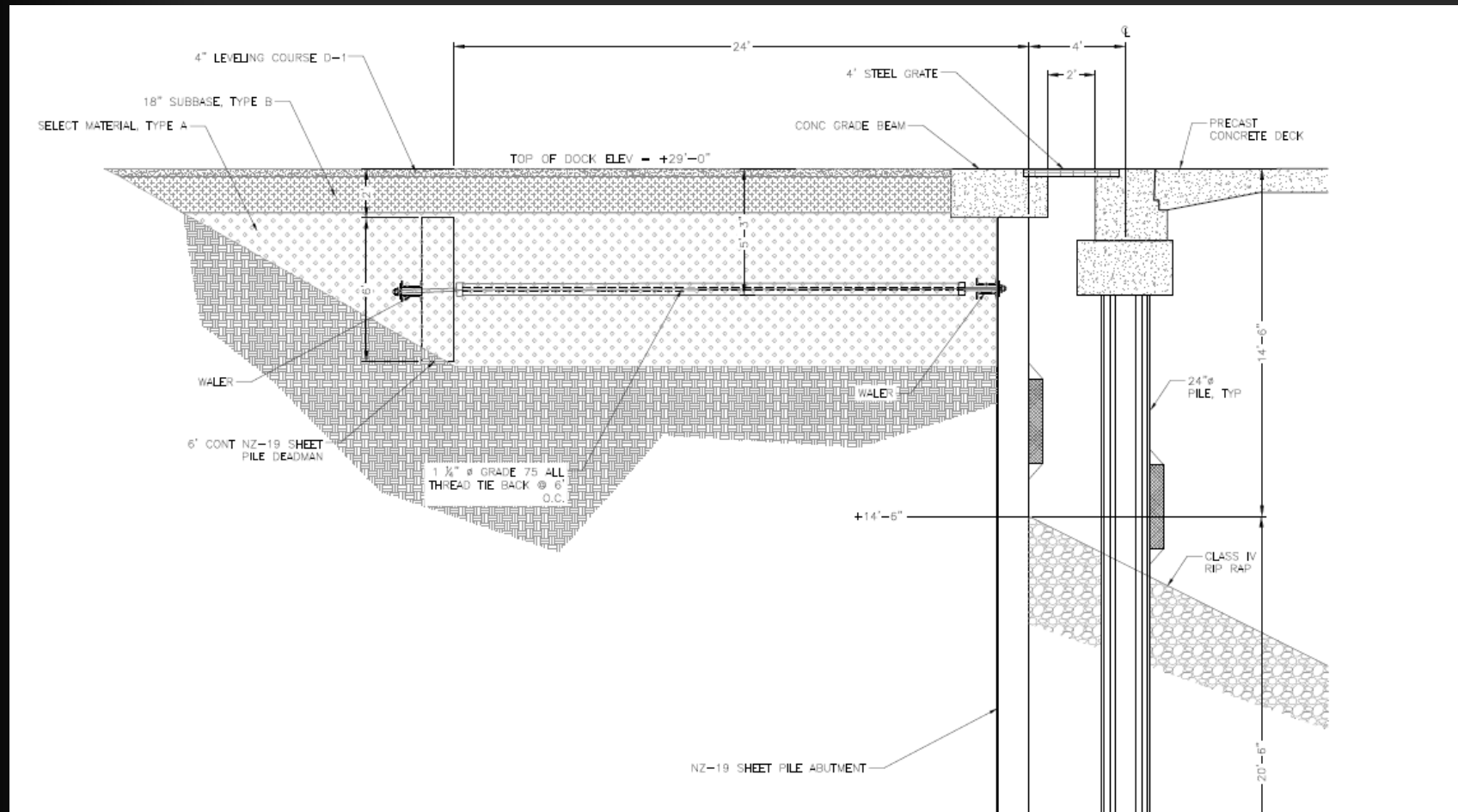
# Design Option 2 Platform Dock







# Design Option 2 Platform Dock





# Design Option 2 Platform Dock

- Pros:
  - All new facilities.
  - Higher level of seismic performance.
  - Accommodates existing and multipurpose users.
  - Reclaims about ½ acre.
- Cons:
  - Highest cost.

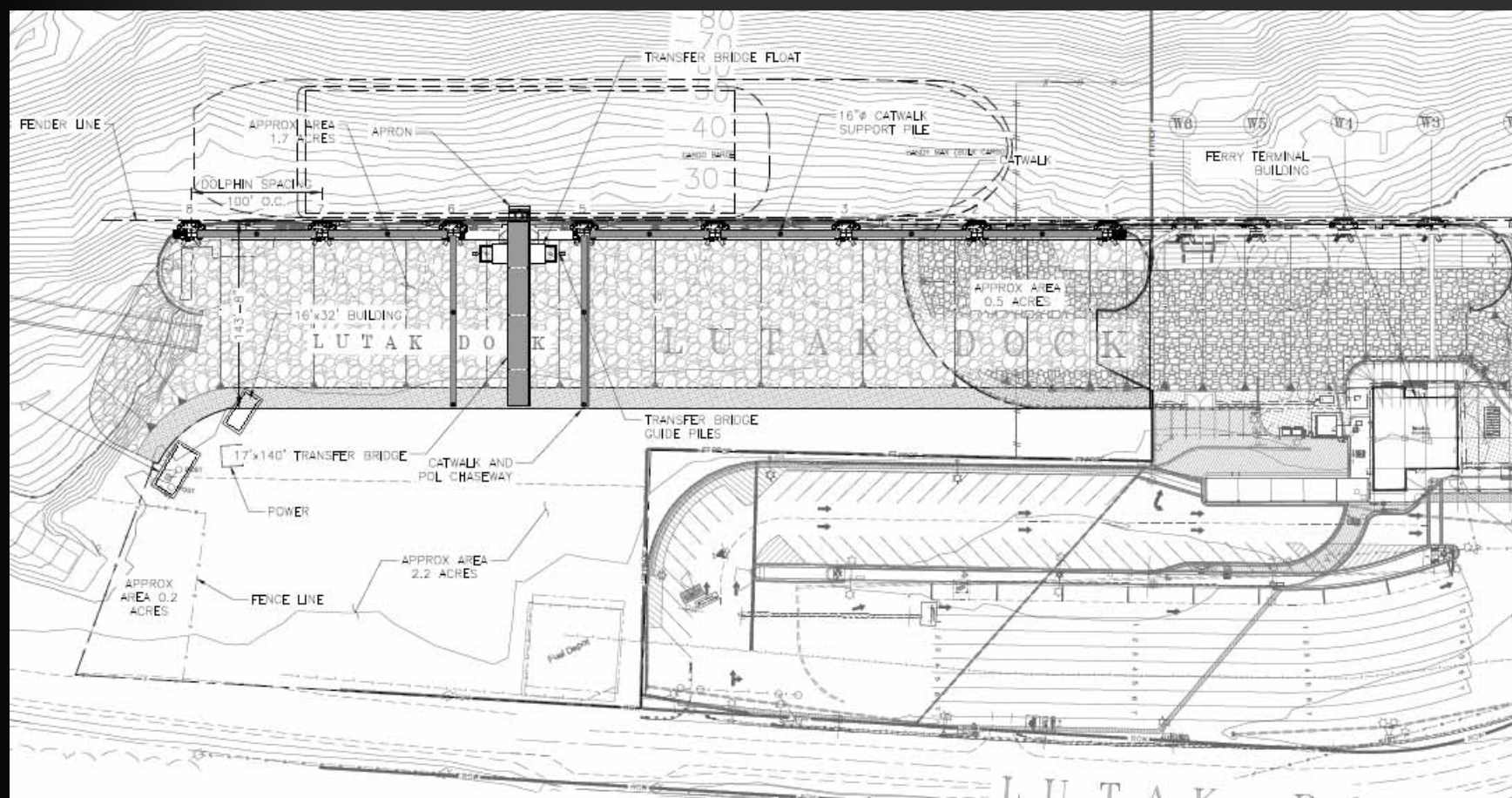


# Design Option 2 Platform Dock

- \$61,000,000



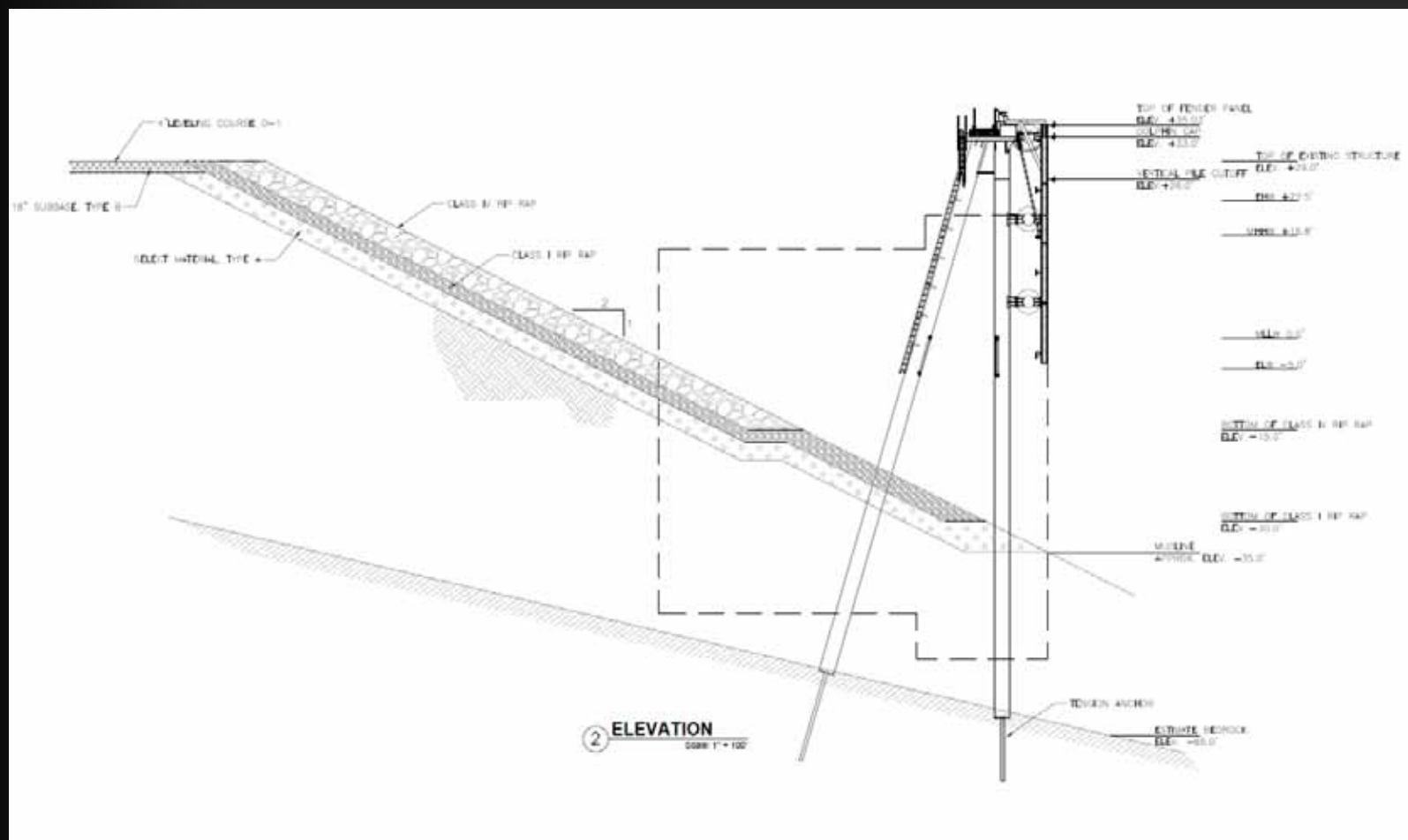
# Design Option 3 Berthing Dolphins





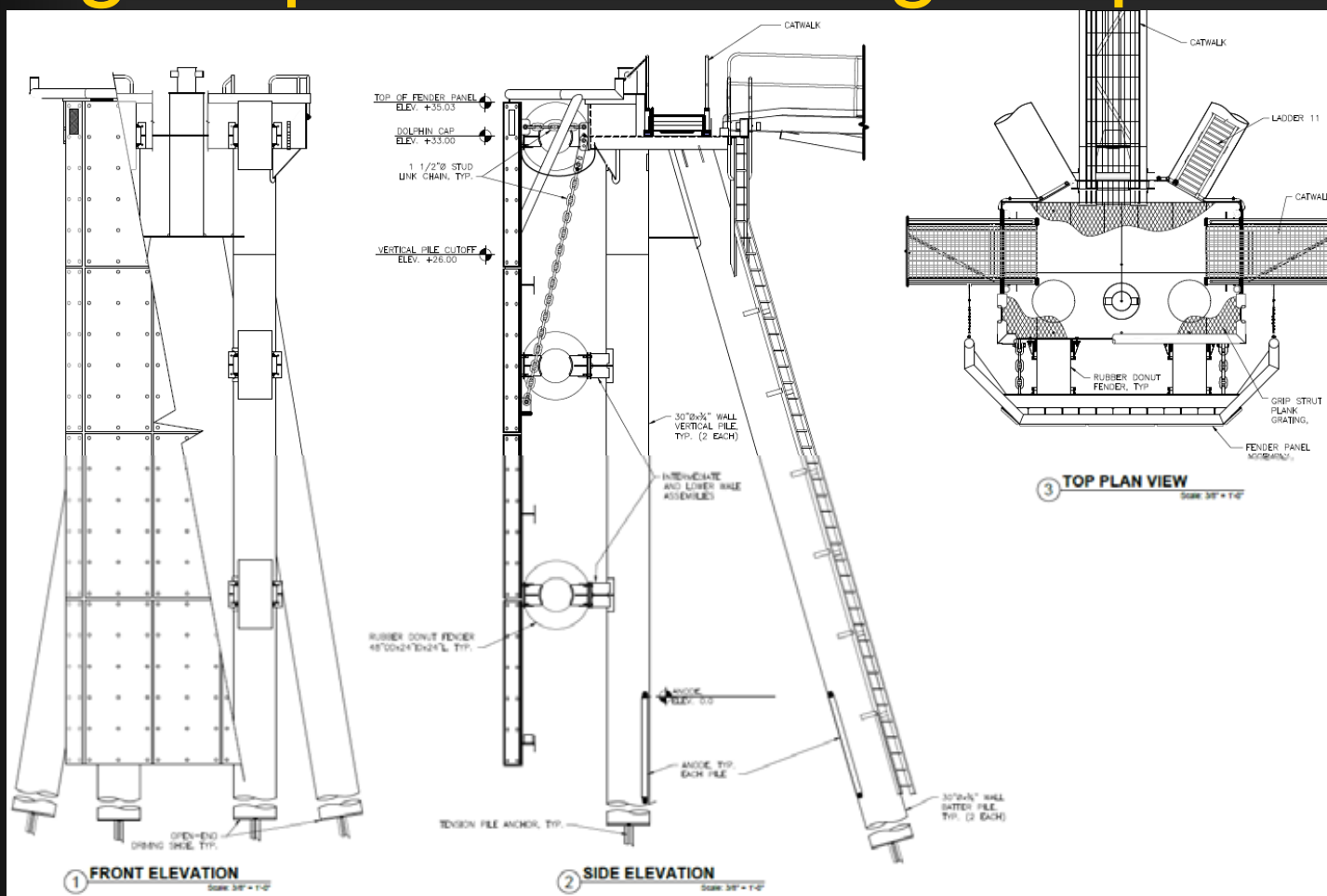


# Design Option 3 Berthing Dolphins





# Design Option 3 Berthing Dolphins





# Design Option 3 Berthing Dolphins

- Pros:
  - Least cost
  - All new facilities
- Cons:
  - Lose about 1.7 acres
  - Lose pass pass and side load ability
  - Lose multi purpose dock
  - 3B - Serviceability limited to existing fuel and cargo barges



# Design Option 3 Berthing Dolphins

- Alternative 3A  
– \$25,383,000
- Alternative 3B  
– \$21,166,000





# Alternatives Analysis Summary

TABLE 1: LUTAK DOCK REPLACEMENT, ALTERNATIVES ANALYSIS SUMMARY

ALT. NO.	DESCRIPTION	PROS	CONS	LEVEL OF SERVICE	CAPITAL COST
1A	ENCAPSULATE USING MODIFIED DIAPHRAGM	<ul style="list-style-type: none"> <li>EFFICIENT AND COST EFFECTIVE</li> <li>MAINTAINS EXISTING FOOTPRINT</li> <li>ACCOMMODATES CURRENT USERS INCLUDING PASS PASS CARGO OPERATIONS</li> <li>RECLAIM ABOUT ½ ACRE UPLANDS AT CELLS 5, 6, AND 7</li> </ul>	<ul style="list-style-type: none"> <li>PILE DRIVING RISK DURING CONSTRUCTION</li> <li>ENCAPSULATES EXISTING SHEETS AND POOR QUALITY FILL</li> </ul>	<ul style="list-style-type: none"> <li>HIGH</li> </ul>	<ul style="list-style-type: none"> <li>\$37,420,000</li> </ul>
1B	ENCAPSULATE USING MODIFIED DIAPHRAGM	<ul style="list-style-type: none"> <li>EFFICIENT AND COST EFFECTIVE</li> <li>MAINTAINS EXISTING FOOTPRINT</li> <li>ACCOMMODATES CURRENT USERS INCLUDING PASS PASS CARGO OPERATIONS</li> </ul>	<ul style="list-style-type: none"> <li>PILE DRIVING RISK DURING CONSTRUCTION</li> <li>ENCAPSULATES EXISTING SHEETS AND POOR QUALITY FILL</li> <li>DOES NOT RECLAIM UPLANDS AT CELLS 5, 6, AND 7</li> </ul>	<ul style="list-style-type: none"> <li>HIGH</li> </ul>	<ul style="list-style-type: none"> <li>\$31,989,000</li> </ul>
2	PLATFORM DOCK (STEEL PILE-SUPPORTED CONCRETE DECK)	<ul style="list-style-type: none"> <li>ALL NEW FACILITIES</li> <li>HIGHER LEVEL OF SEISMIC PERFORMANCE</li> <li>MAINTAINS EXISTING FOOTPRINT AND RECLAIMS ½ ACRE UPLANDS AT CELLS 5, 6, AND 7</li> <li>ACCOMMODATES CURRENT USERS INCLUDING PASS PASS CARGO OPERATIONS</li> </ul>	<ul style="list-style-type: none"> <li>HIGHEST COST</li> </ul>	<ul style="list-style-type: none"> <li>HIGH</li> </ul>	<ul style="list-style-type: none"> <li>\$61,840,000</li> </ul>
3A	DOLPHINS AND TRANSFER BRIDGE	<ul style="list-style-type: none"> <li>ALL NEW FACILITIES</li> </ul>	<ul style="list-style-type: none"> <li>LOSE APPROXIMATELY 1.7 ACRES OF UPLANDS</li> <li>LOSE ABILITY TO USE PASS PASS FOR CARGO OPERATIONS</li> <li>LOSE ABILITY TO SIDE LOAD OVER DOCK FACE</li> </ul>	<ul style="list-style-type: none"> <li>MEDIUM</li> </ul>	<ul style="list-style-type: none"> <li>\$25,383,000</li> </ul>
3B	DOLPHINS AND TRANSFER BRIDGE	<ul style="list-style-type: none"> <li>LEAST COST</li> <li>ALL NEW FACILITIES</li> </ul>	<ul style="list-style-type: none"> <li>LOSE APPROXIMATELY 1.7 ACRES OF UPLANDS</li> <li>LOSE ABILITY TO USE PASS PASS FOR CARGO OPERATIONS</li> <li>LOSE ABILITY TO SIDE LOAD OVER DOCK FACE</li> <li>SERVICEABILITY LIMITED TO EXISTING FUEL AND CARGO BARGES</li> </ul>	<ul style="list-style-type: none"> <li>MEDIUM</li> </ul>	<ul style="list-style-type: none"> <li>\$21,166,000</li> </ul>



# Alternatives Analysis

ALTERNATIVE	SAFETY IMPROVEMENT	DESIGN YEAR LOS		COST
		Multi-Use Dock	Existing Users	
No-Action	✗	Medium	Medium	N/A
1A	✓	High	High	\$\$\$\$
1B	✓	High	High	\$\$\$
2	✓	High	High	\$\$\$\$\$\$
3A	✓	Low	Medium	\$\$\$
3B	✓	✗	Medium	\$\$
Legend: None ✗ Improved ✓				



# Alternatives Analysis Summary

- Alternative 2 cost too high!
- Practical choice between alternative 1 and 3.
- How important are the uplands and multipurpose use?
- How much funding can you get and from where?



# Preferred Alternative

- **Alternative 1B** Encapsulate using Modified Diaphragm
- Provides high level of service
- Supports existing users and multi-use capabilities
- Maintains existing upland area
- Comparatively moderate cost





# Preferred Alternative

- Funding options as relates to alternative selection?
- Most large infrastructure projects have some non local funding.



# Next Steps

- Visit the project website - [www.LutakDock.com](http://www.LutakDock.com)
- Engineering Preferred Alternative will be presented to Ports & Harbors Advisory Committee and Planning Commission February, 1 2017  
Community Meeting # 3
- Planning Commissions will make recommendation to Assembly
- Final report from planning team



# Next Steps

- Prepare lobbying and funding support documents.
- Pursue funding.
- Pursue lobbying efforts.
- Complete preliminary design and field work.
- Adjust final scope to match budget.



# Questions?

- Visit the project website  
[www.LutakDock.com](http://www.LutakDock.com)
- The study team is available for follow on meeting(s) if required.



# Questions?

