



ROTARY BEACH PIER CONCEPTS

CONCEPT OPTIONS, PRECEDENT IMAGES & CLASS D COST ESTIMATES

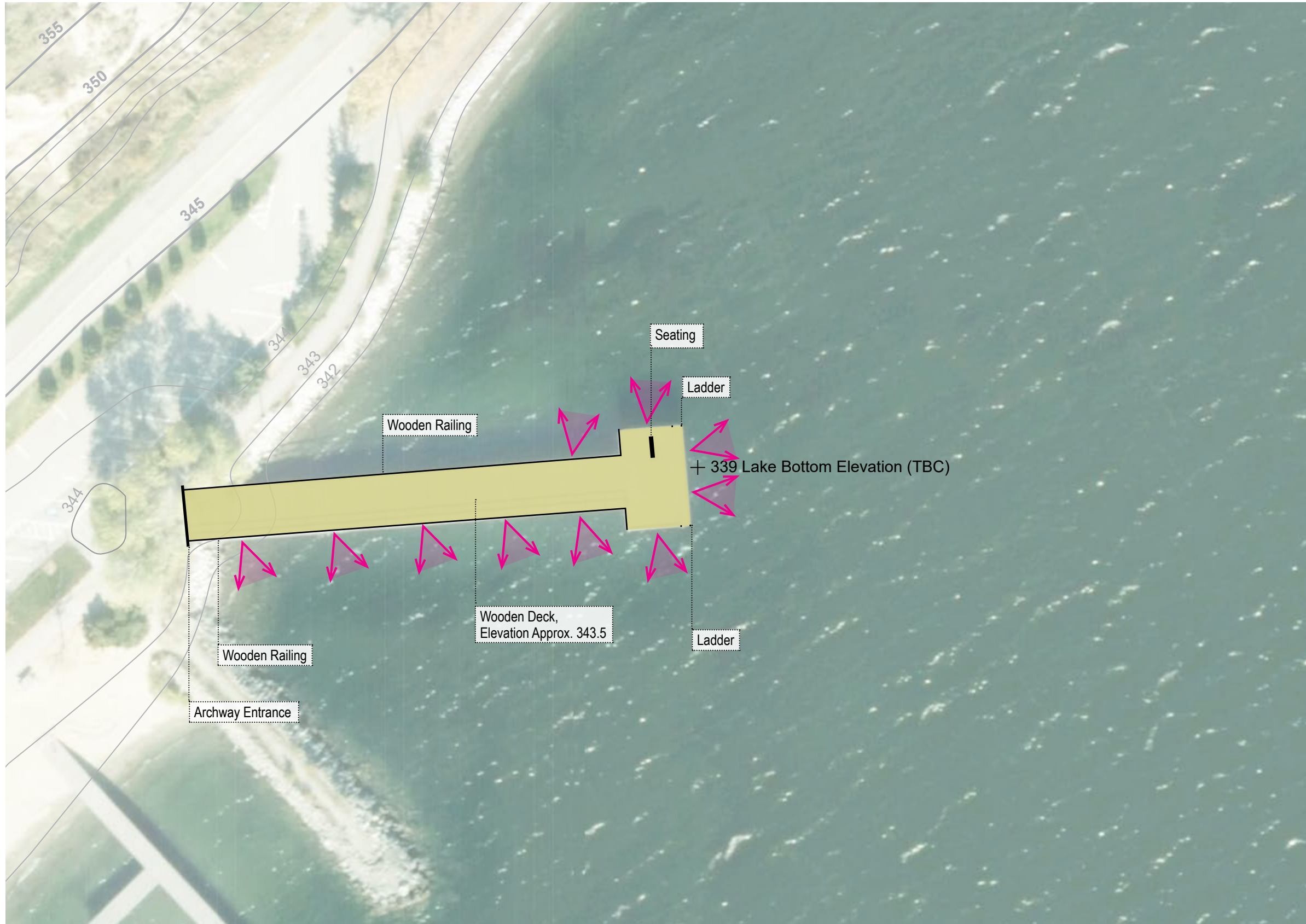
20th June 2023



Prepared for



By





- Key**
-  Land Contour
 -  View Cone

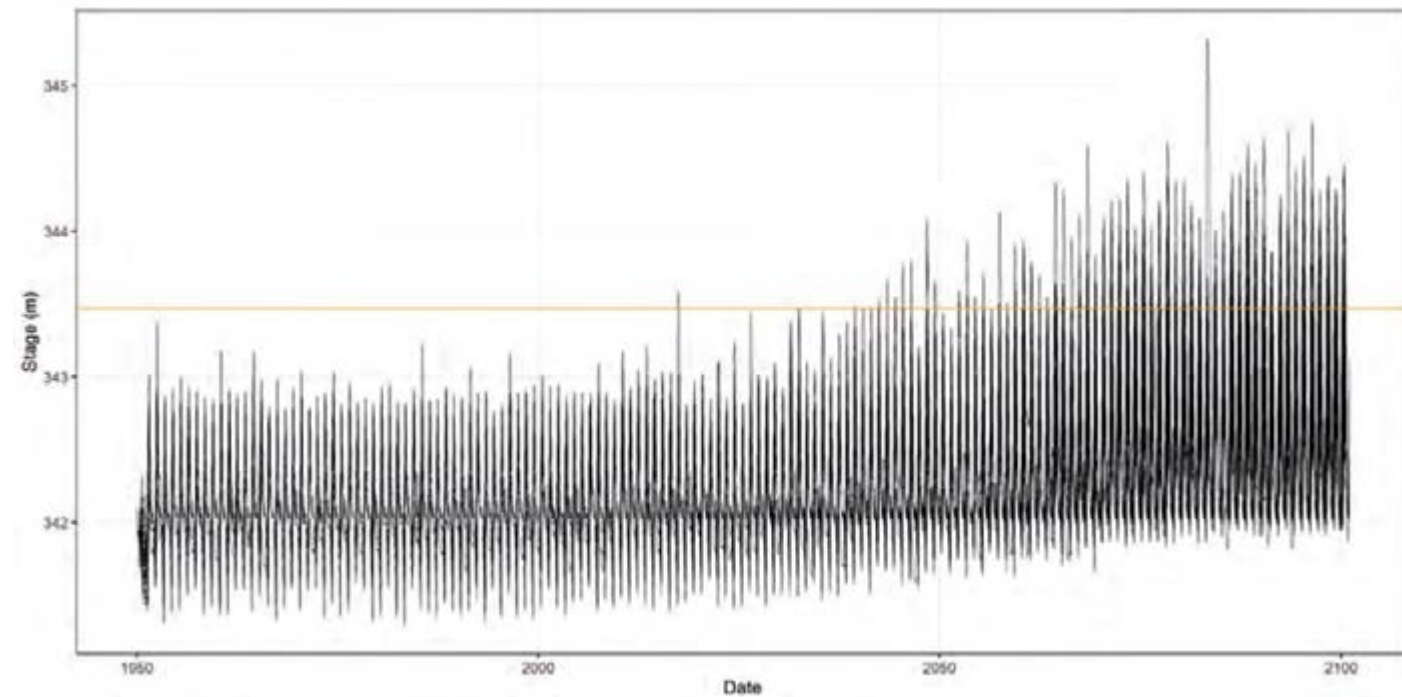
SITE ANALYSIS | WATER LEVELS

Historically (1943-2021), the Okanagan Lake level fluctuation ranged from 340.82m to 343.25m, with the highest peak (343.25m) being in 2017.

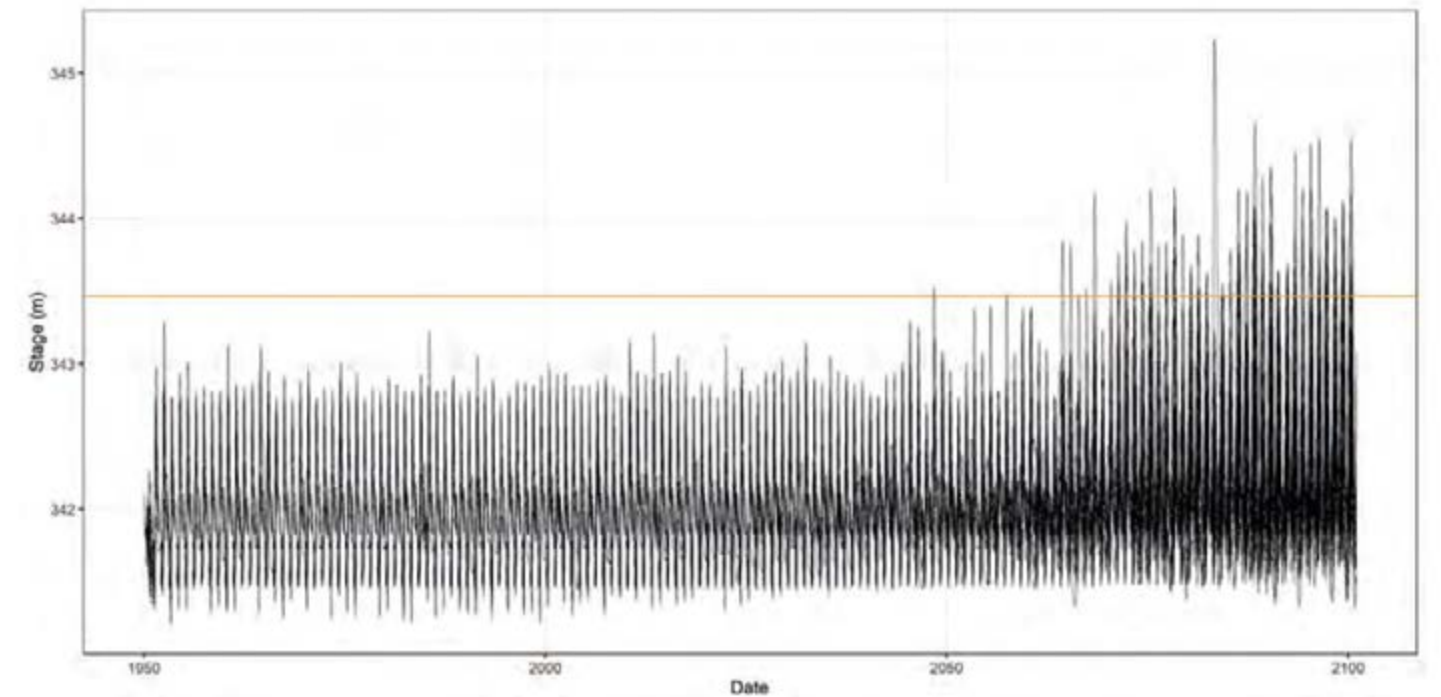
Based on present scenarios of regulation and measures under the Okanagan Basin Water Board, lake levels are projected to range between approximately 341.4 m and 344.1m in the years from now until 2055.

The Ministry of Forests, Lands and Natural Resource Operations has estimated potential modifications to the Okanagan Lake Regulation System (OLRS) to understand flood management options available in the face of climate variability and change. If regulations are changed to reflect these potential modifications, lake levels are projected to range between approximately 341.4m and 343.6m in the years from now until 2055.

The report, *Plan of Study for Modernizing the Okanagan Lake Regulation System: Final Report 2021* outlines a 7-year schedule to complete the research and work required to inform changes to the OLRs.



Lake levels at Okanagan Lake for 1950 to 2100 for the present regulation scenario; orange line indicates 2017 maximum lake level.



Lake levels at Okanagan Lake for the future regulation scenario from 1950 to 2100; orange line indicates 2017 maximum lake level.

Graphs extracted from *Okanagan Mainstream Floodplain Mapping, 2020, Okanagan Basin Water Board*

CONCEPT PLAN & PRECEDENT IMAGES | BASIC OPTION



Existing entrance archway



Electrical distribution (no fixtures)



Memorial signage embedded into wood railing



Seating embedded into wood railing



Swim ladder

CONCEPT PLAN & PRECEDENT IMAGES | ENHANCED OPTION



Wood railing with cable



Aquatic stairs



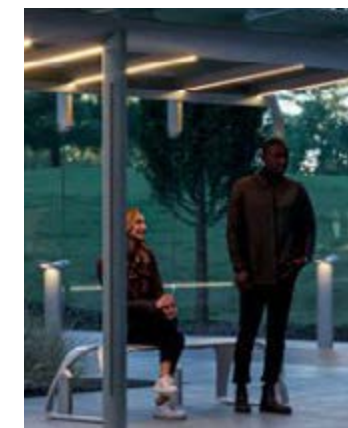
Jump board



Step down platform



Step down platform



Solar lighting fixtures in shade structure

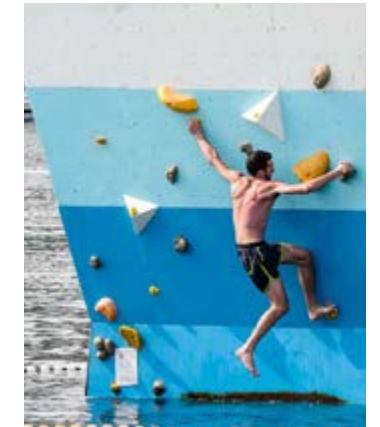


Metal shade structure with perforated metal sheet (proposed 3m high)

CONCEPT PLAN & PRECEDENT IMAGES | PREMIUM OPTION



Slide



Climbing wall



Interpretive signage embedded into railing



Rope swing



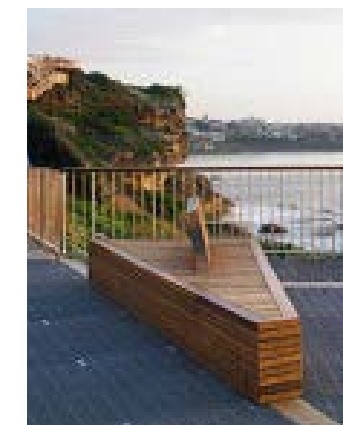
Floating dock and ramp



Metal frame construction with wood exterior; custom steel frame raised platform stepped seating



Custom shade structure



Custom bench island seating arrangement



LED strip light embedded in railing

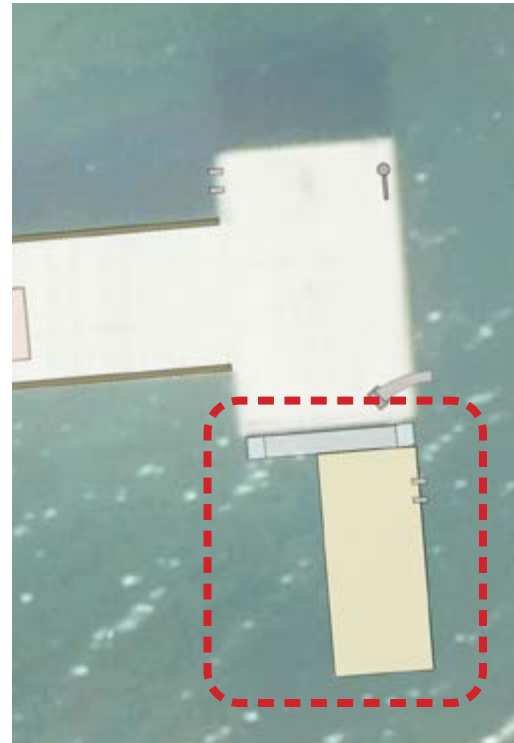


Pre-fabricated steel railing

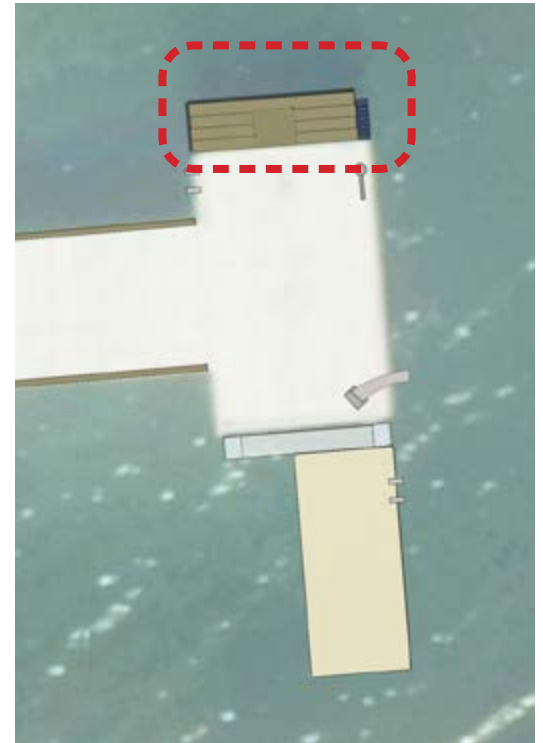
Phase 1



Phase 2



Phase 3



DESIGN CONSIDERATIONS | PIER CONSTRUCTION COMPARISON

EXISTING

BASIC

ENHANCED

PREMIUM

Pier Construction & Decking



Wood Piles, Frame and Decking

\$605,600

- Estimated service life of piles 10-25 years
- Untreated wood piles, treated wood frame and decking



Steel Piles, Wood Frame and Decking

\$701,100

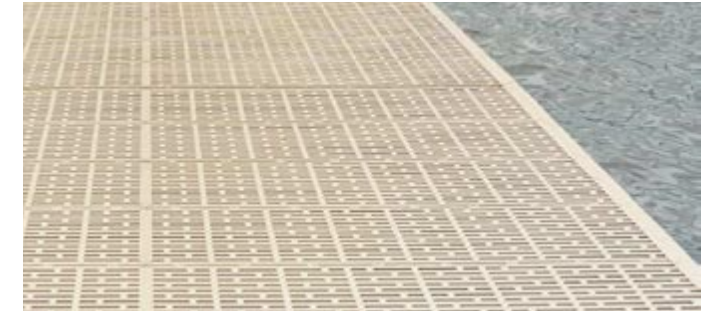
- Estimated service life of piles 50-70 years
- 12" steel piles



Steel Piles, Metal Frame & Wood Decking

\$828,700

- Estimated service life of piles 50-70 years
- 12" steel piles
- Decking can be replaced without affecting structural and frame component



Steel Piles, Metal Frame & Thruflow Decking

\$828,700

- Estimated service life of piles 50-70 years
- 12" steel piles
- Decking can be replaced without affecting structural and frame component
- Mitigates shadowing impact on marine environment.

Railings



Wood

\$25,100

- Similar to existing



Wood With Embedded Seating

\$49,400



Wood With Cable

\$39,200

- Cable prevents children from climbing through but people can still climb over



Pre-fabricated Metal

\$91,000

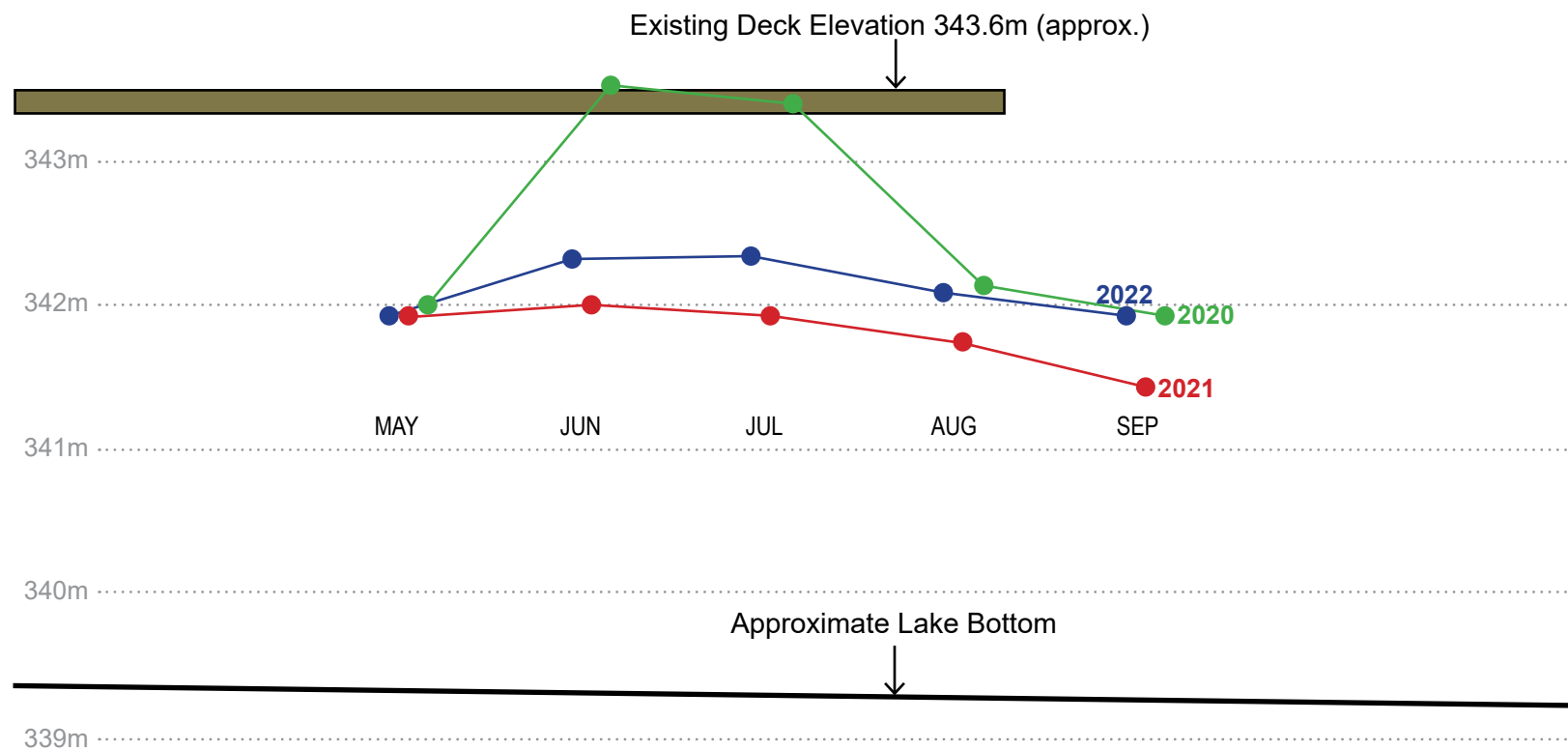
- Design prevents people from climbing over
- Can meet bridge standards
- Best longevity

DESIGN CONSIDERATIONS | SAFETY & RISK

There is risk of injury when jumping into shallow (below 2.5m) water depths from the pier when the water level in the Okanagan is low. The diagram below shows the water levels of Lake Okanagan in the past three years.

Although there is added risk to including play features to the pier, these risks can be managed. Some design considerations for risk management concerning new play features include*:

- **Having an inspection and maintenance policy**
- **General signage at entrance** including general water safety guidelines, known/common risks of the area with regards to water levels, skill and age recommendations for use, lack of lifeguard, parental supervision requirements, rules and expectations, protective equipment that might be needed etc.



Water levels at Lake Okanagan for the season 2020-2022 overlaid on deck and lake bottom elevation



Example of signage concerning risk and safety

*Extracted from information provided by MIABC Risk Management Advisor

COST ESTIMATION | OVERALL COMPARISON

EXISTING	BASIC	ENHANCED	PREMIUM
Pre-Construction Allowance			
\$23,100	\$23,100	\$23,100	\$23,100
Pier Construction & Decking			
Wood Piles, Frame & Decking	Steel Piles, Wood Frame & Decking	Steel Piles, Metal Frame & Wood Decking	Steel Piles, Metal Frame & Thruflow Decking
\$605,600	\$701,100	\$828,700	\$828,700
Railings			
Wood Railing	Wood Railing	Wood Railing With Cable	Pre-fabricated Metal Railing
\$25,100	\$22,000	\$39,200	\$91,000
Seating			
Typ. Wood Bench (1 no.)	Wood Bench Embedded in Railing (7 no.)	Typ. Wood Bench (7 no.)	Custom Bench (4 no.)
\$3,500	\$27,400	\$24,500	\$25,200
Interpretive & Memorial Signage			
-	-	Memorial Plaques (16 no.)	Interpretive Sign Embedded in Railing (2 no.)
		\$3,400	\$4,200
Water Access			
Swim Ladder (2 no.) Swimming Buoy System	Swim Ladder (2 no.) Swimming Buoy System	Aquatic Steps (1 no.) Metal Construction Step Down Platform Swimming Buoy System	Aquatic Steps (1 no.) Swim Ladder (2 no.) Floating Dock Swimming Buoy System
\$9,800	\$9,800	\$32,200	\$91,000
Lighting			
-	Electrical Servicing	Solar LED Embedded in Shade Structure	Electrical Servicing & Distribution LED Strip Light Recessed into Railing
	\$14,000	\$15,400	\$59,500

COST ESTIMATION | OVERALL COMPARISON

EXISTING	BASIC	ENHANCED	PREMIUM
Play Elements			
-	-	Jumping Board (1 no.) \$1,400	Rope Swing (1 no.) Slide (1 no.) \$14,000
Shade Structure			
-	-	Perforated Pattern Metal Sheet \$140,000	Custom Structural Design \$252,000
Raised Platform Seating & Climbing Wall			
-	-	-	\$79,800
TOTAL			
(Subtotal) \$476,500	(Subtotal) \$569,600	(Subtotal) \$791,300	(Subtotal) \$1,048,900
(40% Contingency) \$190,600	(40% Contingency) \$227,800	(40% Contingency) \$316,600	(40% Contingency) \$419,600
\$667,100	\$797,400	\$1,107,900	\$1,468,500

Notes

- Class D Cost Estimate (40% contingency) accounts for general Engineering/Design and Construction.
- Enhanced and Premium options may require additional costs for permitting and specialist consulting.
- Figures are rounded up to the nearest hundred.

CLASS D COST ESTIMATE | DETAILED BREAKDOWN EXISTING OPTION

CLASS D COST ESTIMATE District of Summerland Rotary Beach Dock Improvements

EXISTING

This estimate is based on Concept Options & Precedent Images
Estimate takes into account assumed work including 40% contingency

ITEM no.	DESCRIPTION	UNIT	UNIT PRICE	EST. QTY.	TOTAL
1	Pre-Construction Allowances				
	Contractor mobilization	allowance	\$ 15,000.00	1	\$ 15,000
	Earthworks, granular & aggregate surfacing	allowance	\$ 1,500.00	1	\$ 1,500
	Item Subtotal				\$ 16,500
	Contingency @ 40%				\$ 6,600
	ITEM TOTAL				\$ 23,100
2	Pier Construction & Decking				
	Complete wood construction	m2	\$ 1,022.58	423	\$ 432,551
	Item Subtotal				\$ 432,600
	Contingency @ 40%				\$ 173,000
	ITEM TOTAL				\$ 605,600
3	Railings				
	Wood railing	lin. m	\$ 160.00	112	\$ 17,920
	Item Subtotal				\$ 17,900
	Contingency @ 40%				\$ 7,200
	ITEM TOTAL				\$ 25,100
4	Seating				
	Typ wood bench	ea	\$ 2,500.00	1	\$ 2,500
	Item Subtotal				\$ 2,500
	Contingency @ 40%				\$ 1,000
	ITEM TOTAL				\$ 3,500
7	Water Access				
	Swim ladder	ea	\$ 1,000.00	2	\$ 2,000
	Swimming buoy system	allowance	\$ 5,000.00	1	\$ 5,000
	Item Subtotal				\$ 7,000
	Contingency @ 40%				\$ 2,800
	ITEM TOTAL				\$ 9,800
SUBTOTAL					\$ 476,500
CONTINGENCY					\$ 190,600
TOTAL INCLUDING CONTINGENCY					\$ 667,100

CLASS D COST ESTIMATE | DETAILED BREAKDOWN BASIC OPTION

CLASS D COST ESTIMATE District of Summerland Rotary Beach Dock Improvements

BASIC

This estimate is based on Concept Options & Precedent Images
Estimate takes into account assumed work including 40% contingency

ITEM no.	DESCRIPTION	UNIT	UNIT PRICE	EST. QTY.	TOTAL
1	Pre-Construction Allowances				
	Contractor mobilization	allowance	\$ 15,000.00	1	\$ 15,000
	Earthworks, granular & aggregate surfacing	allowance	\$ 1,500.00	1	\$ 1,500
	Item Subtotal				\$ 16,500
	Contingency @ 40%				\$ 6,600
	ITEM TOTAL				\$ 23,100
2	Pier Construction & Decking				
	12" steel piling wood frame and decking	m2	\$ 1,184.04	423	\$ 500,849
	Item Subtotal				\$ 500,800
	Contingency @ 40%				\$ 200,300
	ITEM TOTAL				\$ 701,100
3	Railings				
	Wood railing	lin. m	\$ 160.00	98	\$ 15,680
	Item Subtotal				\$ 15,700
	Contingency @ 40%				\$ 6,300
	ITEM TOTAL				\$ 22,000
4	Seating				
	Wood bench embedded in railing	ea	\$ 2,800.00	7	\$ 19,600
	Item Subtotal				\$ 19,600
	Contingency @ 40%				\$ 7,800
	ITEM TOTAL				\$ 27,400
7	Water Access				
	Swim ladder	ea	\$ 1,000.00	2	\$ 2,000
	Swimming buoy system	allowance	\$ 5,000.00	1	\$ 5,000
	Item Subtotal				\$ 7,000
	Contingency @ 40%				\$ 2,800
	ITEM TOTAL				\$ 9,800
10	Lighting - Electrical				
	Electrical Servicing (as required)	allowance	\$ 10,000.00	1	\$ 10,000
	Distribution	lin. m	\$ 250.00		\$ -
	Item Subtotal				\$ 10,000
	Contingency @ 40%				\$ 4,000
	ITEM TOTAL				\$ 14,000
SUBTOTAL					\$ 569,600
CONTINGENCY					\$ 227,800
TOTAL INCLUDING CONTINGENCY					\$ 797,400

CLASS D COST ESTIMATE | DETAILED BREAKDOWN ENHANCED OPTION

CLASS D COST ESTIMATE

District of Summerland

Rotary Beach Dock Improvements

ENHANCED

This estimate is based on Concept Options & Precedent Images
Estimate takes into account assumed work including 40% contingency

ITEM no.	DESCRIPTION	UNIT	UNIT PRICE	EST. QTY.	TOTAL
1	Pre-Construction Allowances				
	Contractor mobilization	allowance	\$ 15,000.00	1	\$ 15,000
	Earthworks, granular & aggregate surfacing	allowance	\$ 1,500.00	1	\$ 1,500
	Item Subtotal				\$ 16,500
	Contingency @ 40%				\$ 6,600
	ITEM TOTAL				\$ 23,100
2	Pier Construction & Decking				
	12" steel piling metal frame wood decking	m2	\$ 1,399.32	423	\$ 591,912
	Item Subtotal				\$ 591,900
	Contingency @ 40%				\$ 236,800
	ITEM TOTAL				\$ 828,700
3	Railings				
	Wood railing with cable	lin. m	\$ 280.00	100	\$ 28,000
	Item Subtotal				\$ 28,000
	Contingency @ 40%				\$ 11,200
	ITEM TOTAL				\$ 39,200
4	Seating				
	Typ wood bench	ea	\$ 2,500.00	7	\$ 17,500
	Item Subtotal				\$ 17,500
	Contingency @ 40%				\$ 7,000
	ITEM TOTAL				\$ 24,500
6	Shade Structure				
	Metal construction with perforated metal sheet	allowance	\$ 100,000.00	1	\$ 100,000
	Item Subtotal				\$ 100,000
	Contingency @ 40%				\$ 40,000
	ITEM TOTAL				\$ 140,000
7	Water Access				
	Aquatic steps	ea	\$ 8,000.00	1	\$ 8,000
	Metal construction step-down platform	allowance	\$ 10,000.00	1	\$ 10,000
	Swimming buoy system	allowance	\$ 5,000.00	1	\$ 5,000
	Item Subtotal				\$ 23,000
	Contingency @ 40%				\$ 9,200
	ITEM TOTAL				\$ 32,200
8	Play Elements				
	Jumping board	ea	\$ 1,000.00	1	\$ 1,000
	Item Subtotal				\$ 1,000

Contingency @ 40%					\$ 400
ITEM TOTAL					\$ 1,400

9	Interpretive & Memorial Signage				
	Brushed stainless steel plaque embedded in wood railing	ea	\$ 150.00	16	\$ 2,400
	Item Subtotal				\$ 2,400
	Contingency @ 40%				\$ 1,000
	ITEM TOTAL				\$ 3,400

11	Lighting - Solar				
	Collector and invertor	ea.	\$ 2,500.00	2	\$ 5,000
	LED strip lights	ea.	\$ 300.00	20	\$ 6,000
	Item Subtotal				\$ 11,000
	Contingency @ 40%				\$ 4,400
	ITEM TOTAL				\$ 15,400

SUBTOTAL					\$ 791,300
CONTINGENCY					\$ 316,600
TOTAL INCLUDING CONTINGENCY					\$ 1,107,900

CLASS D COST ESTIMATE | DETAILED BREAKDOWN PREMIUM OPTION

CLASS D COST ESTIMATE District of Summerland Rotary Beach Dock Improvements

PREMIUM

This estimate is based on Concept Options & Precedent Images
Estimate takes into account assumed work including 40% contingency

ITEM no.	DESCRIPTION	UNIT	UNIT PRICE	EST. QTY.	TOTAL
1	Pre-Construction Allowances				
	Contractor mobilization	allowance	\$ 15,000.00	1	\$ 15,000
	Earthworks, granular & aggregate surfacing	allowance	\$ 1,500.00	1	\$ 1,500
	Item Subtotal				\$ 16,500
	Contingency @ 40%				\$ 6,600
	ITEM TOTAL				\$ 23,100
2	Pier Construction & Decking				
	12" steel piling metal frame Thruflow decking	m2	\$ 1,399.32	423	\$ 591,912
	Item Subtotal				\$ 591,900
	Contingency @ 40%				\$ 236,800
	ITEM TOTAL				\$ 828,700
3	Railings				
	Prefab metal railing (bridge standard)	lin. m	\$ 650.00	100	\$ 65,000
	Item Subtotal				\$ 65,000
	Contingency @ 40%				\$ 26,000
	ITEM TOTAL				\$ 91,000
4	Seating				
	Custom bench	ea	\$ 4,500.00	4	\$ 18,000
	Item Subtotal				\$ 18,000
	Contingency @ 40%				\$ 7,200
	ITEM TOTAL				\$ 25,200
5	Raised Platform Seating & Climbing Wall				
	Custom steel frame raised platform seating with timber exterior	allowance	\$ 27,000.00	1	\$ 27,000
	Climbing wall	allowance	\$ 30,000.00	1	\$ 30,000
	Item Subtotal				\$ 57,000
	Contingency @ 40%				\$ 22,800
	ITEM TOTAL				\$ 79,800
6	Shade Structure				
	Metal construction with custom structural design	allowance	\$ 180,000.00	1	\$ 180,000
	Item Subtotal				\$ 180,000
	Contingency @ 40%				\$ 72,000
	ITEM TOTAL				\$ 252,000
7	Water Access				
	Aquatic steps	ea	\$ 8,000.00	1	\$ 8,000
	Swim ladder	ea	\$ 1,000.00	2	\$ 2,000

	Floating dock including ramp	allowance	\$ 50,000.00	1	\$ 50,000
	Swimming buoy system	allowance	\$ 5,000.00	1	\$ 5,000
	Item Subtotal				\$ 65,000
	Contingency @ 40%				\$ 26,000
	ITEM TOTAL				\$ 91,000
8	Play Elements				
	Rope swing	ea	\$ 5,000.00	1	\$ 5,000
	Slide	ea	\$ 5,000.00	1	\$ 5,000
	Item Subtotal				\$ 10,000
	Contingency @ 40%				\$ 4,000
	ITEM TOTAL				\$ 14,000
9	Interpretive & Memorial Signage				
	Interpretive sign embedded in railing (200 x 600mm)	ea	\$ 1,500.00	2	\$ 3,000
	Item Subtotal				\$ 3,000
	Contingency @ 40%				\$ 1,200
	ITEM TOTAL				\$ 4,200
10	Lighting - Electrical				
	Electrical Servicing (as required)	allowance	\$ 10,000.00	1	\$ 10,000
	Distribution	lin. m	\$ 250.00	100	\$ 25,000
	LED strip light recessed into railing	lin. m	\$ 75.00	100	\$ 7,500
	Item Subtotal				\$ 42,500
	Contingency @ 40%				\$ 17,000
	ITEM TOTAL				\$ 59,500
SUBTOTAL					\$ 1,048,900
CONTINGENCY					\$ 419,600
TOTAL INCLUDING CONTINGENCY					\$ 1,468,500