CITY AND BOROUGH OF SITKA, ALASKA

HARBOR SYSTEM MASTER PLAN

Condition Inventory & Moorage Rate Recommendations

Prepared by:

PND ENGINEERS, INC.

In association with :

Northern Economics

MAY 2012

SITKA HARBOR SYSTEM MASTER PLAN

Contents

The City and Borough of Sitka (CBS) has developed this Harbor System Master Plan to help prioritize and budget for maintaining and replacing its harbor infrastructure over the long term. The planning process was conducted in two parts and is reported in that manner. Part 1 provides a comprehensive condition inventory, estimation of remaining service life and replacement costs for all harbor related marine and upland facilities operated by the CBS Port and Harbors Department. Part 2 provides guidance on the moorage rates required to fund the full life cycle costs of the harbor system's operations, maintenance, and replacement needs. In addition to rate recommendations, the report also discusses the Harbor Fund's working capital requirements and presents a preliminary plan for debt issuance to support cash flow needs.

PART I—Sitka Harbor System Condition Inventory

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PART II—Moorage Rate Recommendations

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MAY 2012

PART I
SITKA HARBOR SYSTEM CONDITION INVENTORY

Sitka Harbor System Condition Inventory

Prepared for

City and Borough of Sitka

Prepared by:

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May 2012

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Sitka Harbor System Condition Inventory

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SECTION 1—EXECUTIVE SUMMARY

EXECUTIVE SUMMARY

This report is Part 1 of an overall Harbor System Master Plan that provides the City and Borough of Sitka (CBS) with necessary information to assist it in planning for its long term harbor replacement needs. A Capital Improvement Projects (CIP) plan and recommended moorage rates have been developed to prepare Sitka for the full life cycle costs associated with its harbor improvements.

The purpose of this report is to provide a facility inventory and general condition overview of its municipal harbor infrastructure. Estimated remaining service life and budgetary cost estimates for in kind replacement of each harbor facility is included. Specific designs and recommendations for repair or replacement projects are not included in this report.

Background

The majority of Sitka's harbor infrastructure was originally designed by the Alaska Department of Transportation & Public Facilities (ADOT&PF). Most of the subsequent major renovations, reconstructions, and improvements to the facilities were also funded by state or federal sources. A timeline of significant infrastructure improvement and corresponding moorage rates at the time of the improvement is provided at the end of this summary.

Inspection & Inventory

Field work for the facility condition inspections was performed by PND Engineers, Inc. (PND) and its sub consultants from November 8th through November 10th, 2011. PND (marine and civil) was assisted by Haight and Associates (electrical), Murray and Associates (mechanical), and MAKERS Architectural and Urban Design (architectural).

Sixteen harbor facilities owned and maintained by the CBS were included in the inventory program. The primary components of each facility were examined to note deficiencies that affect function, service life, safety, and code compliance. The civil and structural inspections were limited to visual examination of primary accessible components to assess mechanical damage, rot, corrosion and other evidence of deterioration. Underwater inspections, geotechnical investigations and surveying services were not included in the scope of this assessment.

Prior to conducting the field inventories, initial work tasks included the collection and review of available survey data, harbor maps, aerial photographs, geotechnical information, design and construction records related to Sitka's harbors. A base map of each harbor was developed to organize and identify specific features at each facility.

Safe and Usable Service life

Upon completion of the field inspections, a remaining safe and usable service life for each facility was assessed. Within this report, the term "safe and usable service life" is generally defined as the duration that a facility is structurally, mechanically, and/or electrically fit to adequately and safely perform its intended purpose. In Southeast Alaska, 30 years is a common industry standard for estimating the service life of new marine facilities without significant rehabilitation during their lifespan. However, with rigorous and

consistent maintenance procedures, the service life of most marine facilities can be extended. In Sitka, where routine maintenance is performed, it appears that 40 years of safe and usable service life is achievable. Combined with the field assessments, the review and examination of facility background information including dates of construction, repair, and expansion produced an estimated remaining safe and usable service life for each facility.

Budgetary Estimates

Budgetary estimates for the in kind replacement of each facility have been developed. In kind replacement is defined as having a similar functional and geometric configuration as compared to the existing facility. Elements of each facility that were found to be out dated by code or common practice were budgeted with components that meet modern industry standards. When the time comes to replace a facility, additional planning efforts will be necessary to address current and projected operational requirements such as the makeup of the anticipated fleet. This may warrant some logistical or geometric changes to existing harbor layouts. However, without conducting extensive planning at this time, in kind replacement was deemed the most efficient means to develop baseline capital improvement budgets for all harbor facilities.

Budgetary estimates were prepared based on current bid costs for similar marine facilities located throughout Southeast Alaska. Unit bid prices were researched for public waterfront improvements constructed within the last five years and then escalated to 2012 dollars. In Sitka, Thomsen Harbor Replacement was constructed in 2006-7. It is the most current moorage facility in Sitka and is considered by the Harbor Department as the design standard to be used for estimating replacement costs for all moorage facilities. Unit bid prices for the Thomsen Harbor floats averaged $65 to $70 per square foot in 2006. Six years later, this study utilizes unit costs at $80/SF for standard moorage floats designed with HDPE floatation tubs, galvanized steel and treated timber structural decks. As a comparison, timber float systems constructed in the early to mid 90's commonly bid around $25/SF. Notably, costs have increased over 300% in the last 20 years.

Capital Improvement Projects Plan

PND worked closely with the CBS to establish facility replacement priorities. The objective of prioritization was to assist the CBS in developing a Capital Improvement Projects (CIP) plan for the long term replacement of all harbor infrastructure. Priorities were developed based primarily on the remaining service life of each facility however priorities were also refined based on the CBS's perception of user demand and a general assessment of facility importance to the community.

Replacement budgets for each major facility were categorized to identify specific capital costs associated with marine facilities (over water), upland access and parking, building facilities and interim electrical improvements. This approach served to maximize the remaining safe and usable service life of each major component, and to maintain project replacement budgets in an achievable range with the assistance of federal and state grant funds.

The proposed Capital Improvement Projects (CIP) plan follows. The plan includes the estimated project budget, remaining service life, anticipated funding sources, and anticipated construction year for each project.

SCALE IN FEET

0 .5 MILE 1 MILE

AERIAL PHOTOGRAPHY FROM:
CITY & BOROUGH OF SITKA

SITKA HARBOR SYSTEM MASTER PLAN FACILITY SUMMARY

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SITKA HARBOR SYSTEM MASTER PLAN

AERIAL OVERVIEW & VICINITY MAP

PND 112070.01

CITY AND BOROUGH OF SITKA
HARBOR SYSTEM TIMELINE

YEAR	PERMANENT MOORAGE RATE	TRANSIENT MOORAGE RATE	PROJECT
1956	Unknown	Unknown	ANB Harbor Construction
1957			
1958			
1959			
1960			
1961			
1962			Seaplane Facility Construction
1963			Boat Grid Construction
1964			
1965			Crescent Harbor Phase I Construction (Floats 1 & 2, Boat Launch, High Load Dock)
1966			Crescent Harbor Phase II Construction (Floats 3 & 4)
1967			
1968			
1969			Crescent Harbor Phase III Construction (Floats 5 & 6)
1970			Crescent Harbor Phase IV Construction (Float 7)
1971			
1972			
1973			Thomsen Harbor Breakwater Float Construction
1974			ANB Harbor Improvements
1975			
1976			Thomsen Harbor Construction
			Marine Service Center Bulkhead Construction
1977			
1978			Seaplane Facility Improvements
1979			
1980			
1981			
1982			
1983			Thomsen Harbor Breakwater Float Major Repairs
			Sealing Cove Harbor Construction (included Boat Launch)
1984			
1985			Crescent Harbor High Load Dock Improvements & Net Shed Construction
1986			ANB Harbor & Eliason Harbor Restroom Construction
1987		$0.10/ft/day	
1988			Fisherman's Work Float Construction
			Sealing Cove Harbor Restroom Construction
1989		$0.12/ft/day	Thomsen Harbor Breakwater Float Major Repairs
			Boat Grid Addition and Repairs
1990	$0.80/ft/month		
1991		$0.17/ft/day	ANB Harbor Reconstruction/Finger Float Replacement
			Thomsen Harbor Electrical Renovations
1992		$0.20/ft/day	***ANB Harbor deeded to CBS from ADOT&PF***
1993			Fish Cleaning Float Construction
			Marine Service Center Cathodic Protection
1994			Harbor Office Building Construction
1995		$0.24/ft/day	ANB Harbor Improvements
1996		0-80': $0.24/ft/day 81'-150': $0.48/ft/day >150': $0.75/ft/day	Eliason Harbor Phase I Construction (New Thomsen Harbor)
			Thomsen Harbor Breakwater Float Reorientation
1997			O'Connell Bridge Lightering Facility Construction
1998			Eliason Harbor Phase II Construction (New Thomsen Harbor)
1999			
2000	$1.05/ft/month	0-80': $0.30/ft/day 81'-150': $0.50/ft/day >150': $0.75/ft/day	Thomsen Harbor Repairs
2001			***Crescent Harbor (Floats A-D, 1-4), High Load Dock, Lightering Float, and Boat Launch deeded to CBS from ADOT&PF***
2002			O'Connell Bridge Lightering Facility Reconstruction
			Crescent Harbor Lightering Facility Reconstruction (Float from O'Connell Bridge)
			Marine Service Center Cathodic Protection
2003	$1.30/ft/month		Crescent Harbor Finger Float Repairs
2004			***Crescent Harbor (Floats E-F, 5-7), Sealing Cove Harbor, and Thomsen Harbor deeded to CBS from ADOT&PF***
2005	$1.75/ft/month	0-80': $0.35/ft/day 81'-150': $0.60/ft/day >150': $0.90/ft/day	Crescent Harbor Electrical System Renovation
2006	$1.90/ft/month		Thomsen Harbor Replacement
			Sealing Cove Harbor Water System Upgrades
2007			
2008			
2009			
2010			
2011			
2012			Harbor System Master Plan (in progress)

Sitka Harbor System Master Plan - Capital Improvement Projects

Master Plan Facility ID		Estimated Remaining Service Life (Years)	Total Recommended Project Budget ($)	Anticipated Grant Funding ($)	Anticipated Sitka Harbor Capital Cost ($)	Project Year
13A	Net Shed Roof Repairs	2	$139,108		$139,108	2013
5A	ANB Harbor	5	$8,245,166	$4,122,583	$4,122,583	2013
1D	Crescent Harbor Upland Access and Parking - Multi-Use Lot	10	$1,288,052	$1,288,052	$0	2013
11B	Crescent Harbor Boat Launch Ramp Upland Access and Parking	10	$117,501	$117,501	$0	2013
16	Seaplane Float	5	$11,200,000	$10,640,000	$560,000	2014
2B	Thomsen Harbor Upland Access and Parking	5	$638,550		$638,550	2014
6	Thomsen Harbor Breakwater Float	5	$4,948,169		$4,948,169	2015
1A	Crescent Harbor - 1965 Era	5	$6,240,267		$6,240,267	2016
15	Marine Service Center	5	$5,862,780		$5,862,780	2017
4B	Eliason Harbor Electrical Replacement	5	$2,309,175		$2,309,175	2017
3A	Sealing Cove Harbor Maintenance Repairs	10	$700,000		$700,000	2017
12A	Sealing Cove Harbor Boat Launch Ramp	10	$965,250		$965,250	2019
11A	Crescent Harbor Boat Launch Ramp	10	$330,413		$330,413	2019
3C	Sealing Cove Harbor Upland Access and Parking	10	$748,440		$748,440	2020
12B	Sealing Cove Harbor Boat Launch Ramp Upland Access and Parking	10	$270,270		$270,270	2020
1C	Crescent Harbor Upland Access and Parking - Lincoln Street Lots	10	$248,923		$248,923	2020
4C	Eliason Harbor Upland Access and Parking	10	$993,094		$993,094	2021
5B	ANB Harbor Upland Access and Parking	10	$496,733		$496,733	2021
10	Fish Cleaning Float	10	$280,108		$280,108	2021
9A	Fisherman's Work Float	10	$2,400,131		$2,400,131	2022
2D	Thomsen Harbor Restroom	14	$213,543		$213,543	2024
1B	Crescent Harbor - 2002 Improvements	15	$9,711,232		$9,711,232	2026
3B	Sealing Cove Harbor (Two Phases)	15	$10,729,660		$10,729,660	2027-8
8	Crescent Harbor Lightering Float	15	$2,084,198		$2,084,198	2027
4A	Eliason Harbor (Five Phases)	20	$26,012,894		$26,012,894	2032-6
14	Boat Grid	20	$3,166,020		$3,166,020	2032
7B	O'Connell Bridge Lightering Float Upland Access and Parking	20	$373,106		$373,106	2032
9B	Fisherman's Work Float Upland Access and Parking	20	$219,409		$219,409	2032
4D	Eliason Harbor Restroom	24	$304,425		$304,425	2036
5C	ANB Harbor Restroom	24	$226,741		$226,741	2037
7A	O'Connell Bridge Lightering Float	25	$1,481,288		$1,481,288	2037
13B	Crescent Harbor High Load Dock & Net Shed	25	$4,980,441		$4,980,441	2037
3D	Sealing Cove Harbor Restroom	26	$272,884		$272,884	2038
2C	Thomsen Harbor Harbor Office	32	$371,725		$371,725	2044
2A	Thomsen Harbor	35	$8,940,947		$8,940,947	2047
7C	O'Connell Bridge Lightering Float Restroom	50	$197,505		$197,505	2062
TOTAL			**$117,708,148**	**$16,168,136**	**$101,540,012**	

SECTION 2—HARBOR FACILITIES CONDITION INVENTORY

CRESCENT HARBOR

Crescent Harbor was originally designed by the State of Alaska, Department of Transportation & Public Facilities, and constructed in several phases. The initial construction occurred in 1965, and over the past 46 years has undergone numerous expansion and repair phases.

The harbor provides moorage for 365 vessels ranging in lengths from approximately 17-ft to 75-ft. Access to the float system is provided by three 50-ft long steel gangways, two of which are supported by 6-ft x 35-ft timber approach docks along Lincoln Street and the third extends from the high load dock. The harbor consists of both concrete and timber float units. The 10-ft wide headwalk gives access to seven mainwalk floats, each supporting finger floats of varying lengths. The float system is anchored in place by both steel pipe and timber piles. The floats are equipped with power, lighting, water, and fire utilities. Small asphalt paved parking areas exist at each of the gangways along Lincoln Street. A larger multi-purpose paved parking area serves harbor patrons adjacent to the high load dock and net shed.

The first construction phase that occurred in 1965 consisted of construction of floats 1 and 2 and the headwalk. Also constructed under this phase was the gangway and access float from the high load dock. A second construction phase occurred in 1966 which included construction of floats 3 and 4 and additional headwalk. In 1969 the third phase of construction occurred which included installation of gangway access to the existing float 4, and construction of concrete floats 5 and 6 and additional concrete headwalk. In 1970 the final expansion phase of the harbor occurred, which included installation of float 7 and its access float from float 6. A repair project occurred in 2002 which replaced approximately 50 percent of the finger floats install on floats 1, 2, and 3. The electrical system was renovated in 2005.

Observations

Approach Dock:
The timber approach docks are in fair condition. The decking and handrails are weathered and show signs of wear but appear to be structurally sound.

Gangway:
The general condition of the gangways is fair to poor. The primary concern regarding the gangways is their length. 50-ft gangways are no longer permitted in new construction due to the steep gradient that is created during low tides. 80-ft minimum length gangways are required to meet current American Disabilities Act (ADA) standards.

Timber Main Floats:
The general overall condition of the main floats is poor. The freeboard has dropped to as little as 7-in in some areas, which has caused the 6x6 sills to be submerged and as a result many of them are rotten. The timber decking and bullrail is worn throughout most of the harbor.

Timber Finger Floats:
The majority of the finger floats on mainwalks 1, 2, and 3 have been replaced within the past 10 years. The integrity of the structural components of these floats appear to be in good condition, however about half of the finger floats are severely twisted and are listing from side to side and/or front to back.

Concrete Main Floats:
Overall the concrete main floats are in poor condition. Spalling and hairline cracks in the surface of the concrete deck are evident throughout the harbor. The freeboard has dropped to 7-in throughout most of the mainwalks and has caused the lower portion of the structural walers to become submerged. The timbers no longer appear to have wood preservative remaining and in some locations show advanced stages of rot. The

hinge connection assemblies are extremely worn as a result of constant steel on steel wearing and have resulted in section loss and reduced capacity of the connection hardware.

Concrete Finger Floats:
The majority of the finger floats are in poor condition. The vertical side surfaces of many of the concrete float shells are cracked and large sections of concrete has spalled off.

Piles:
Many of the timber piles are worn on either side due to mechanical abrasion of the timber against the steel pile hoops, however most piles appear to have some structural capacity remaining. The steel piles on mainwalks 1, 2, and 3 that have recently been replaced along with the finger floats are in good to new condition.

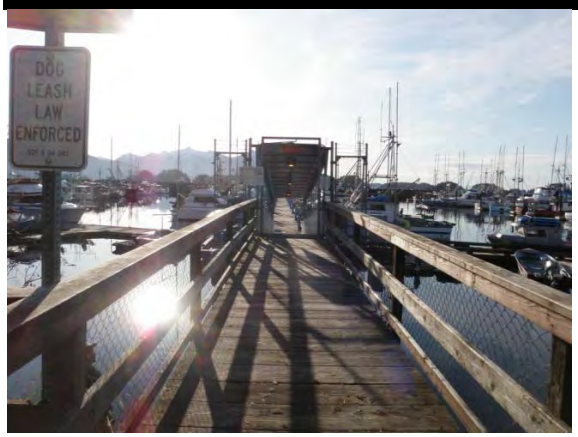
Water System:
The harbor water system consists of a float mounted HDPE water main which feeds float mounted pedestals. The pedestals are equipped with two 3/4" garden hose bibs and one 2" fire hose connection. The water pedestals appear to be functioning properly.

Uplands Access and Parking:
The upland parking areas along Lincoln Street consist of a 50-ft x 60-ft asphalt paved lot at the top of each gangway. Concrete curb and gutter surround the parking areas. The walkway extending the length of the harbor is managed by the CBS Parks and Recreation Department and was not included in this study. An additional larger paved parking area near the net shed serves as a multi-use facility for harbor patrons, Centennial Hall, and local businesses. The multi-use parking area adjacent to the dock is approximately 1.2 acres in size. An underground storm water system provides drainage for water runoff in the parking area. The south edge of the parking area is lined with curb & gutter and concrete sidewalk with a green area and viewing benches that exists between the curb & gutter and sidewalk. High mast light poles light the area. Overall, all three upland lots are in fair condition. The multi-use parking area is planned for reconstruction in fall 2012 – spring 2013 as a part of the Centennial Hall Parking Lot Improvements Project.

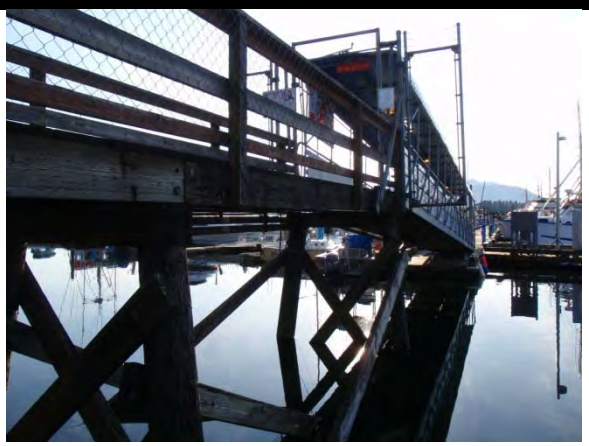
Conclusions

Due to the numerous repair and expansion phases that the harbor has undergone during its life span, some components have recently been repaired or replaced and are in fair to good condition. However, the majority of the facility, and many critical structural components have exceeded their life expectancy and are in need of replacement. It is estimated that the 1965 harbor facilities have a remaining safe and usable service life of approximately 5 years. It is estimated that the harbor facilities upgraded in 2002 have a remaining safe and usable service life of approximately 15 years.

CRESCENT HARBOR PHOTOGRAPH LOG

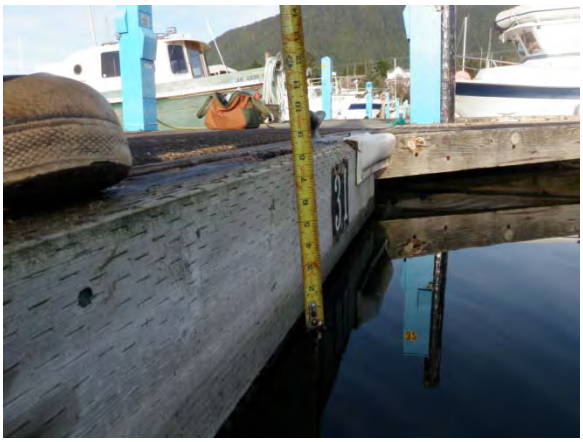


Timber Approach Dock



Timber Approach Dock

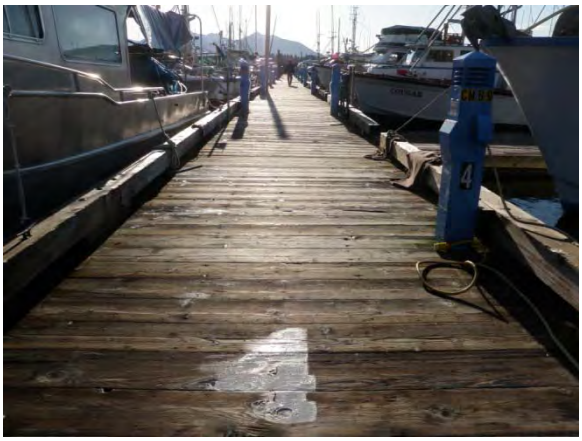
Pitting on Concrete Float Deck



8-in Freeboard

Concrete Finger Float

Spalled Concrete Finger Float

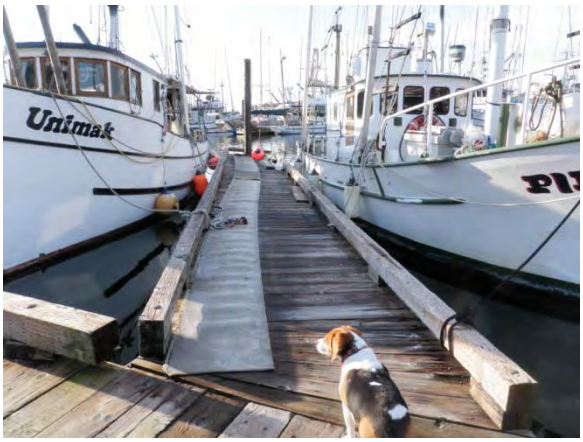


Timber Mainwalk Float

Rotten Timber Sill

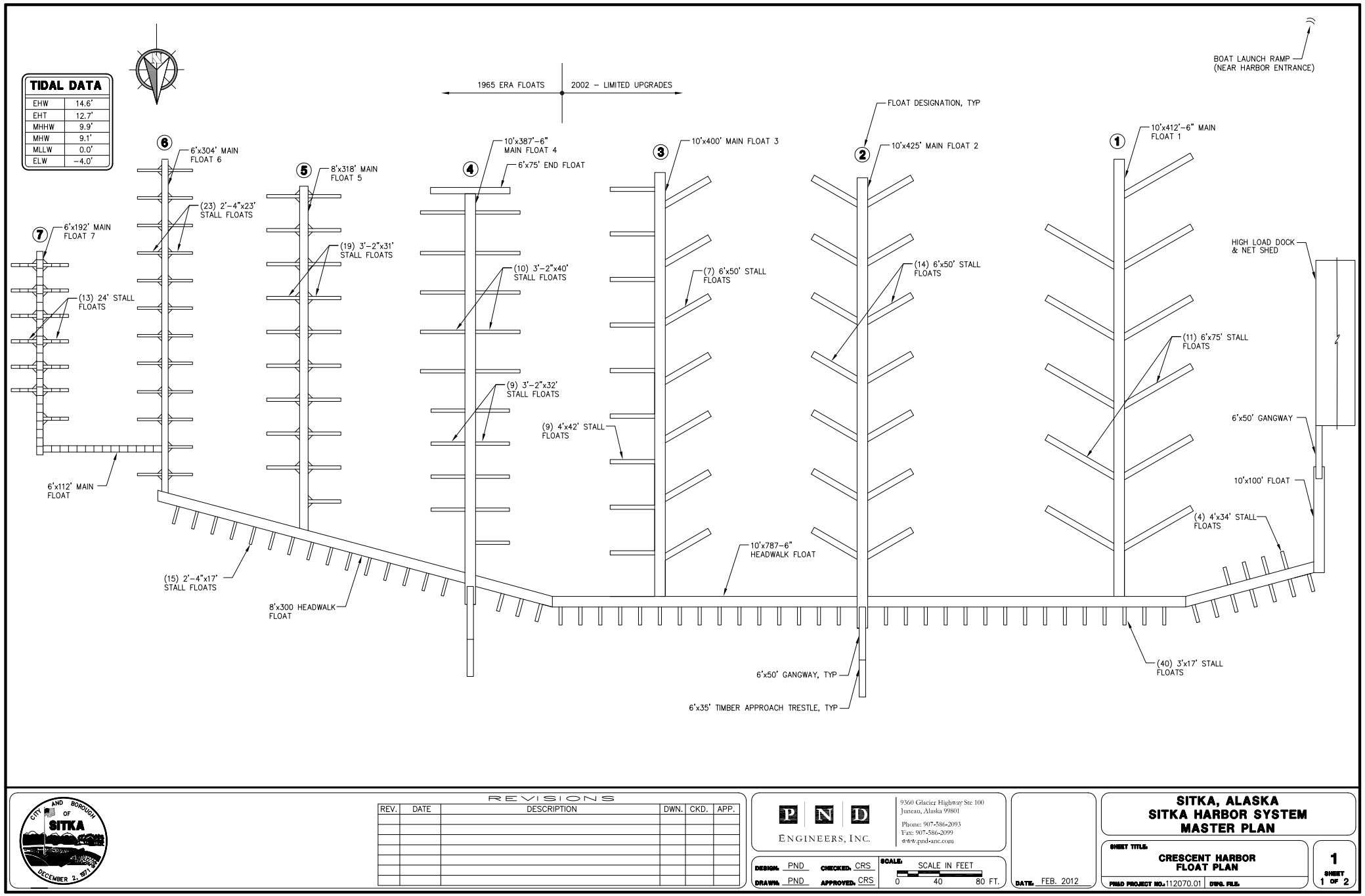
Rotten Deckboard

Listing Finger Float



Twisted Finger Float

Multi-Use Parking Lot


TIDAL DATA
EHW 14.6'
EHT 12.7'
MHHW 9.9'
MHW 9.1'
MLLW 0.0'
ELW −4.0'
1965 ERA FLOATS
2002 – LIMITED UPGRADES
BOAT LAUNCH RAMP (NEAR HARBOR ENTRANCE)
FLOAT DESIGNATION, TYP
7
6'x192' MAIN FLOAT 7
(13) 24' STALL FLOATS
6'x112' MAIN FLOAT
6
6'x304' MAIN FLOAT 6
(23) 2'-4"x23' STALL FLOATS
(15) 2'-4"x17' STALL FLOATS
8'x300 HEADWALK FLOAT
5
8'x318' MAIN FLOAT 5
(19) 3'-2"x31' STALL FLOATS
4
10'x387'-6" MAIN FLOAT 4
6'x75' END FLOAT
(10) 3'-2"x40' STALL FLOATS
(9) 3'-2"x32' STALL FLOATS
3
10'x400' MAIN FLOAT 3
(7) 6'x50' STALL FLOATS
(9) 4'x42' STALL FLOATS
10'x787-6" HEADWALK FLOAT
2
10'x425' MAIN FLOAT 2
(14) 6'x50' STALL FLOATS
6'x50' GANGWAY, TYP
6'x35' TIMBER APPROACH TRESTLE, TYP
1
10'x412'-6" MAIN FLOAT 1
(11) 6'x75' STALL FLOATS
(40) 3'x17' STALL FLOATS
HIGH LOAD DOCK & NET SHED
6'x50' GANGWAY
10'x100' FLOAT
(4) 4'x34' STALL FLOATS
CITY AND BOROUGH OF SITKA
DECEMBER 2, 1971
REVISIONS
REV. DATE DESCRIPTION DWN. CKD. APP.
PND ENGINEERS, INC.
9360 Glacier Highway Ste 100
Juneau, Alaska 99801
Phone: 907-586-2093
Fax: 907-586-2099
www.pnd-anc.com
DESIGN: PND CHECKED: CRS
DRAWN: PND APPROVED: CRS
SCALE: SCALE IN FEET
0 40 80 FT.
DATE: FEB. 2012
SITKA, ALASKA
SITKA HARBOR SYSTEM
MASTER PLAN
SHEET TITLE:
CRESCENT HARBOR
FLOAT PLAN
PND PROJECT NO. 112070.01
DWG. FILE:
1
SHEET 1 OF 2

TIDAL DATA

EHW	14.6'
EHT	12.7'
MHHW	9.9'
MHW	9.1'
MLLW	0.0'
ELW	-4.0'

CITY AND BOROUGH OF SITKA
DECEMBER 2, 1971

REVISIONS

REV.	DATE	DESCRIPTION	DWN.	CKD.	APP.

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DESIGN: PND CHECKED: CRS
DRAWN: PND APPROVED: CRS
SCALE: SCALE IN FEET 0 40 80 FT.

DATE: FEB. 2012

SITKA, ALASKA
SITKA HARBOR SYSTEM MASTER PLAN

SHEET TITLE: **CRESCENT HARBOR UPLANDS**

PND PROJECT NO.: 112070.01 DWG. FILE:

SHEET 2 OF 2

1 CRESCENT HARBOR
IN KIND REPLACEMENT BUDGETARY ESTIMATE
Prepared By: PND Engineers, Inc., February 2012

Item	Item Description	Units	Quantity	Unit Cost	Amount
1A	**HARBOR FACILITIES - 1965 ERA**				
1	Mobilization	LS	All Reqd	10%	$420,220
2	Demolition & Disposal	LS	All Reqd	$160,000	$160,000
3	Domestic Water & Fire System	LS	All Reqd	$220,000	$220,000
4	Construction Surveying	LS	All Reqd	$15,000	$15,000
5	Timber Approach Dock	EA	1	$50,000	$50,000
6	80' Covered Aluminum Gangway	EA	1	$120,000	$120,000
7	Signage	LS	All Reqd	$5,000	$5,000
8	Headwalk Float 10' x 270'	SF	2700	$80	$216,000
9	East Headwalk Float 10' x 112'	SF	1120	$80	$89,600
10	Float 4, 10' x 387.5'	SF	3875	$80	$310,000
11	Float 5, 10' x 318'	SF	3180	$80	$254,400
12	Float 6, 10' x 304'	SF	3040	$80	$243,200
13	Float 7, 10' x 192'	SF	1920	$80	$153,600
14	Gangway Landing Float, 16' x 20'	EA	1	$32,000	$32,000
15	3' x 17' Finger Float	EA	18	$5,100	$91,800
16	4' x 24' Finger Float	EA	36	$9,600	$345,600
17	4' x 32' Finger Float	EA	9	$12,800	$115,200
18	5' x 40' Finger Float	EA	10	$20,000	$200,000
19	8' x 75' End Float	EA	1	$60,000	$60,000
20	10' x 10' Transformer Float	EA	2	$10,000	$20,000
21	Steel Pipe Pile, 12" dia. x 0.500" thick	EA	70	$7,500	$525,000
22	Predrilled Pile Sockets	EA	35	$4,500	$157,500
23	Anodes	EA	140	$1,500	$210,000
24	Supply Floatation Billet	EA	30	$150	$4,500
25	Install Floatation Billet	EA	30	$300	$9,000
26	Life Ring Cabinet and Base	EA	8	$1,000	$8,000
27	Fire Extinguisher with Hose Cabinet and Base	EA	8	$1,200	$9,600
28	Self Rescue Ladders	EA	12	$600	$7,200
29	Electrical System	LS	All Reqd	$550,000	$550,000
30	Spare Electrical Equipment	LS	All Reqd	$20,000	$20,000
	ESTIMATED CONSTRUCTION BID PRICE				**$4,622,420**
	CONTINGENCY (15%)				**$693,363**
	ENVIRONMENTAL PERMITTING, FINAL DESIGN, CONTRACT ADMINISTRATION, CONSTRUCTION INSPECTION & OTHER INDIRECT COSTS (20%)				**$924,484**
	TOTAL RECOMMENDED PROJECT BUDGET				**$6,240,267**

Item	Item Description	Units	Quantity	Unit Cost	Amount
1B	**HARBOR FACILITIES - 2002 IMPROVEMENTS**				
1	Mobilization	LS	All Reqd	10%	$653,955
2	Demolition & Disposal	LS	All Reqd	$240,000	$240,000
3	Domestic Water & Fire System	LS	All Reqd	$340,000	$340,000
4	Construction Surveying	LS	All Reqd	$20,000	$20,000
5	Timber Approach Dock	EA	1	$50,000	$50,000
6	80' Covered Aluminum Gangway	EA	2	$120,000	$240,000
7	Signage	LS	All Reqd	$7,000	$7,000
8	Headwalk Float 10' x 820'	SF	8200	$80	$656,000
9	West Headwalk Float 10' x 80'	SF	800	$80	$64,000
10	Float 1, 10' x 412.5'	SF	4125	$80	$330,000
11	Float 2, 10' x 425'	SF	4250	$80	$340,000
12	Float 3, 10' x 400'	SF	4000	$80	$320,000
13	Gangway Landing Float, 16' x 20'	EA	1	$32,000	$32,000
14	3' x 17' Finger Float	EA	37	$5,100	$188,700
15	4' x 34' Finger Float	EA	4	$13,600	$54,400
16	5' x 42' Finger Float	EA	9	$21,000	$189,000
17	6' x 50' Finger Float	EA	21	$30,000	$630,000
18	8' x 75' Finger Float	EA	11	$60,000	$660,000
19	10' x 10' Transformer Float	EA	2	$10,000	$20,000
20	Steel Pipe Pile, 12" dia. x 0.500" thick	EA	105	$7,500	$787,500
21	Predrilled Pile Sockets	EA	53	$4,500	$238,500
22	Anodes	EA	210	$1,500	$315,000
23	Supply Floatation Billet	EA	45	$150	$6,750
24	Install Floatation Billet	EA	45	$300	$13,500
25	Life Ring Cabinet and Base	EA	8	$1,000	$8,000
26	Fire Extinguisher with Hose Cabinet and Base	EA	8	$1,200	$9,600
27	Self Rescue Ladders	EA	16	$600	$9,600
28	Electrical System	LS	All Reqd	$750,000	$750,000
29	Spare Electrical Equipment	LS	All Reqd	$20,000	$20,000
	ESTIMATED CONSTRUCTION BID PRICE				**$7,193,505**
	CONTINGENCY (15%)				**$1,079,026**
	ENVIRONMENTAL PERMITTING, FINAL DESIGN, CONTRACT ADMINISTRATION, CONSTRUCTION INSPECTION & OTHER INDIRECT COSTS (20%)				**$1,438,701**
	TOTAL RECOMMENDED PROJECT BUDGET				**$9,711,232**

Item	Item Description	Units	Quantity	Unit Cost	Amount
1C	**UPLAND ACCESS AND PARKING - LINCOLN STREET LOTS**				
1	Mobilization	LS	All Reqd	10%	$16,763
2	Excavation and Demolition & Disposal	CY	300	$15	$4,500
3	Base Course, Grading D-1	CY	250	$50	$12,500
4	Storm Drain System	LS	All Reqd	$30,000	$30,000
5	3" ACP Paving	SY	675	$55	$37,125
6	Painting & Striping	LS	All Reqd	$10,000	$10,000
7	Curb & Gutter	LF	400	$40	$16,000
8	Construction Surveying	LS	All Reqd	$7,500	$7,500
9	Electrical/Lighting System	LS	All Reqd	$50,000	$50,000
	ESTIMATED CONSTRUCTION BID PRICE				**$184,388**
	CONTINGENCY (15%)				**$27,658**
	ENVIRONMENTAL PERMITTING, FINAL DESIGN, CONTRACT ADMINISTRATION, CONSTRUCTION INSPECTION & OTHER INDIRECT COSTS (20%)				**$36,878**
	TOTAL RECOMMENDED PROJECT BUDGET				**$248,923**
1D	**UPLAND ACCESS AND PARKING - MULTI-USE LOT**				
1	Mobilization	LS	All Reqd	10%	$86,738
2	Excavation and Demolition & Disposal	CY	1400	$15	$21,000
3	Base Course, Grading D-1	CY	900	$50	$45,000
4	Concrete Sidewalk	SY	2250	$100	$225,000
5	Curb & Gutter	LF	450	$40	$18,000
6	Storm Drain System	LS	All Reqd	$120,000	$120,000
7	3" ACP Paving	SY	5425	$55	$298,375
8	Painting & Striping	LS	All Reqd	$25,000	$25,000
9	Construction Surveying	LS	All Reqd	$15,000	$15,000
10	Electrical/Lighting System	LS	All Reqd	$100,000	$100,000
	ESTIMATED CONSTRUCTION BID PRICE				**$954,113**
	CONTINGENCY (15%)				**$143,117**
	ENVIRONMENTAL PERMITTING, FINAL DESIGN, CONTRACT ADMINISTRATION, CONSTRUCTION INSPECTION & OTHER INDIRECT COSTS (20%)				**$190,823**
	TOTAL RECOMMENDED PROJECT BUDGET				**$1,288,052**

THOMSEN HARBOR

Thomsen Harbor was originally designed by the Alaska Department of Transportation and Public Facilities in 1976. The harbor was reconfigured and replaced entirely in 2006, as designed by PND Engineers, Inc. and constructed by Dawson Construction.

The harbor provides moorage for approximately 226 vessels ranging in lengths from approximately 20-ft to 82-ft. The moorage system consists of a 10-ft wide headwalk float which gives access to three, 10-ft wide mainwalk floats and two, 8-ft wide mainwalk floats. The float system is anchored in place by steel pipe piles. Access to the headwalk float is provided by a 14-ft x 22-ft timber approach dock which supports an 80-ft long ADA compliant aluminum gangway. The uplands area consists of approximately .75 acres of gravel and asphalt surfaced parking area.

Observations

In general, the current overall condition of the facility is good to new. None of the observations made presented structural, safety, or code concerns.

Gangway:
The aluminum gangway is in new condition with no noted deficiencies.

Moorage Floats:
The timber floats are in new to good condition with no significant deficiencies. There is a slight vertical difference in the timber deck at transitions from the headwalk to the various mainwalks that could present a trip hazard.

Piles:
The steel pipe piles are in new condition and galvanized coatings are intact.

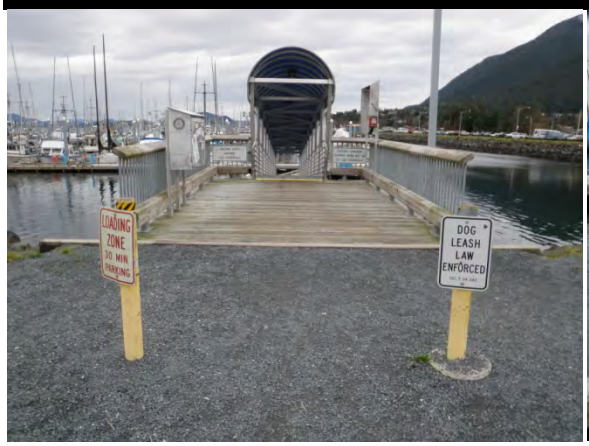
Upland Access and Parking:
Discussions with harbor staff have revealed that the much of the uplands fill pad was constructed on an old dump site. There is settlement that has occurred in the asphalt and gravel throughout the parking area, which is most likely a result of this being constructed on structurally insufficient fill. The condition of the upland access and parking area is poor and should be upgraded within 5 years or as soon as funds are available.

Water Utilities:
The harbor's water & fire system consists of a float mounted HDPE water main that is connected to the City's main water service. The water and fire pedestals consist of insulated PVC standpipes. All standpipes appeared to be in working order, although are known to freeze due to lack of a heat trace system.

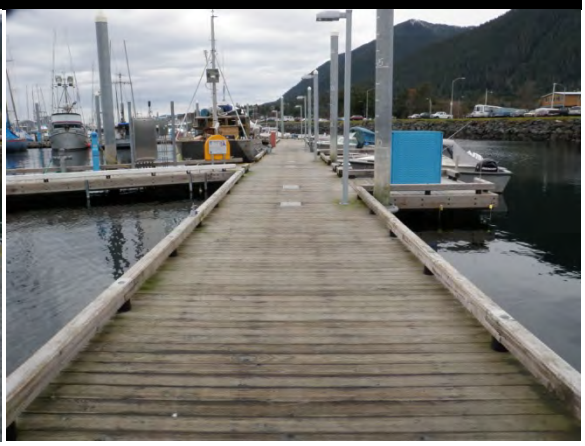
Conclusions

The overall condition of the harbor facilities is good to new. The harbor moorage system has an estimated remaining service life of approximately 35 years.

THOMSEN HARBOR PHOTOGRAPH LOG

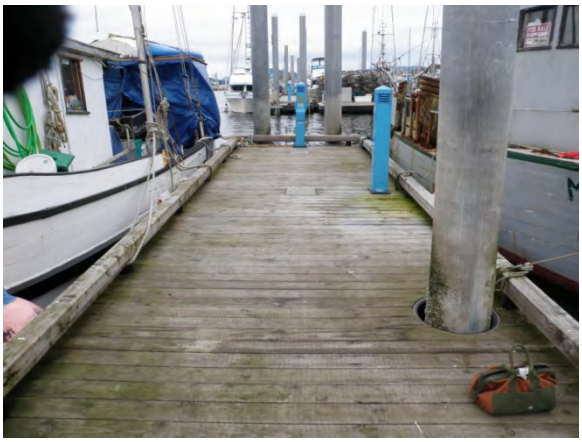


Approach Dock

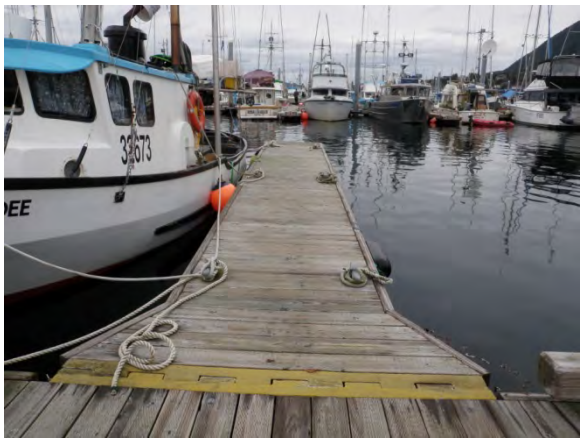


Headwalk Float

Mainwalk Float

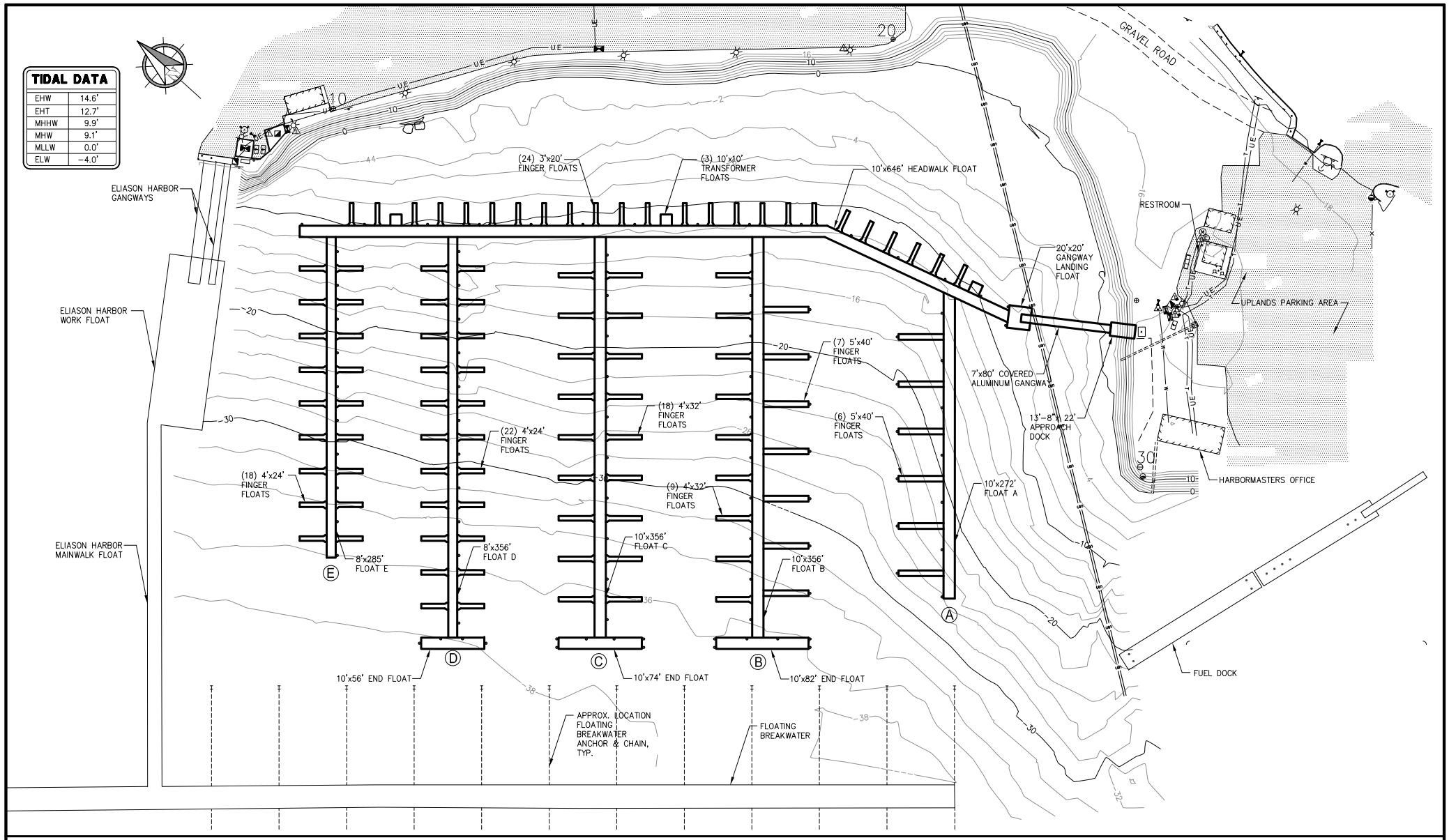


End Float



Finger Float

Uplands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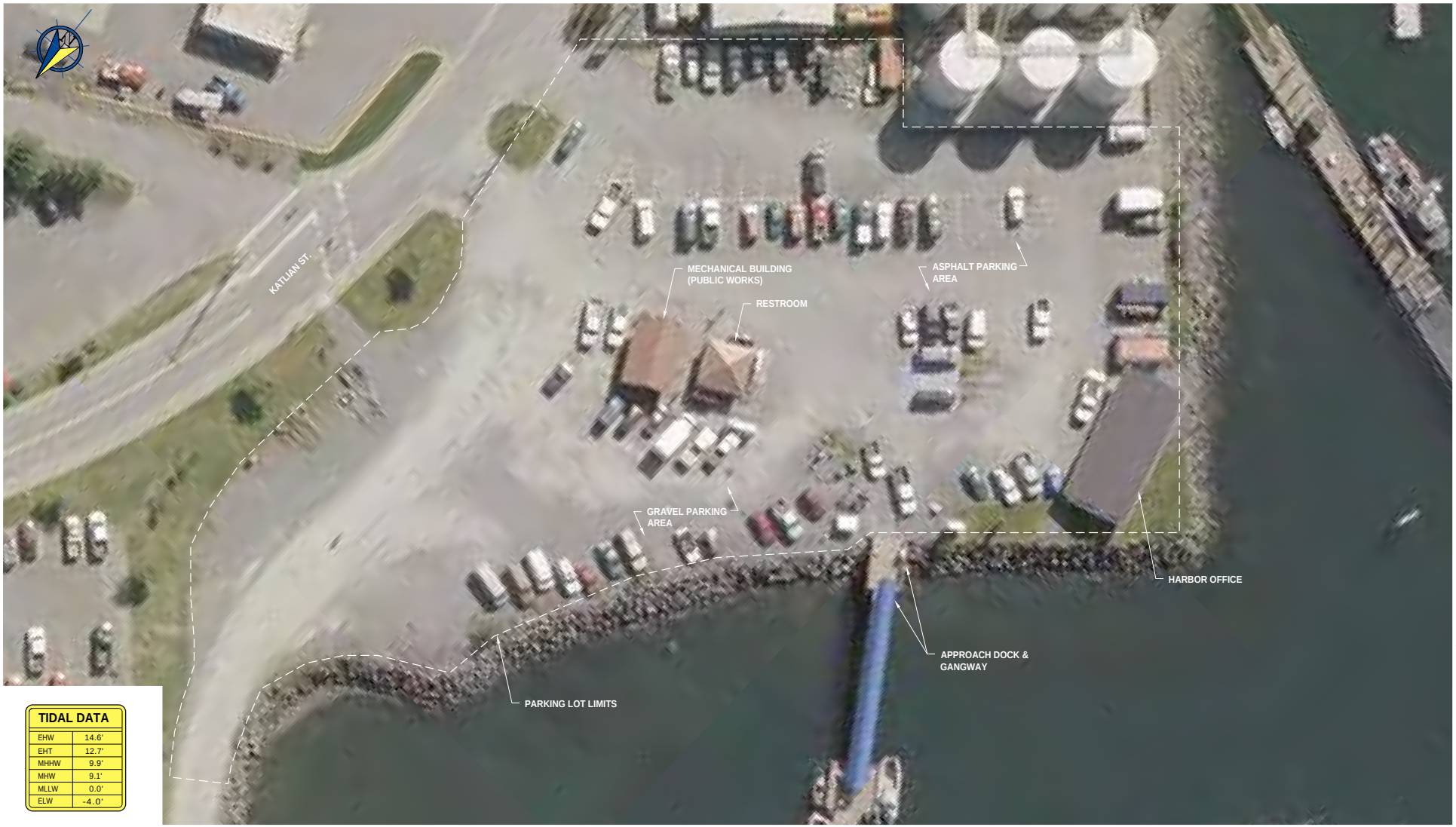
EHW 14.6'
EHT 12.7'
MHHW 9.9'
MHW 9.1'
MLLW 0.0'
ELW −4.0'
GRAVEL ROAD
ELIASON HARBOR GANGWAYS
ELIASON HARBOR WORK FLOAT
ELIASON HARBOR MAINWALK FLOAT
(24) 3'x20' FINGER FLOATS
(3) 10'x10' TRANSFORMER FLOATS
10'x646' HEADWALK FLOAT
RESTROOM
20'x20' GANGWAY LANDING FLOAT
UPLANDS PARKING AREA
(7) 5'x40' FINGER FLOATS
7'x80' COVERED ALUMINUM GANGWAY
13'-8"x 22' APPROACH DOCK
(18) 4'x32' FINGER FLOATS
(6) 5'x40' FINGER FLOATS
(22) 4'x24' FINGER FLOATS
(18) 4'x24' FINGER FLOATS
(9) 4'x32' FINGER FLOATS
10'x272' FLOAT A
HARBORMASTERS OFFICE
8'x285' FLOAT E
8'x356' FLOAT D
10'x356' FLOAT C
10'x356' FLOAT B
E
D
C
B
A
10'x56' END FLOAT
10'x74' END FLOAT
10'x82' END FLOAT
FUEL DOCK
APPROX. LOCATION FLOATING BREAKWATER ANCHOR & CHAIN, TYP.
FLOATING BREAKWATER
CITY AND BOROUGH OF SITKA
DECEMBER 2, 1971
REVISIONS
REV. DATE DESCRIPTION DWN. CKD. APP.
PND ENGINEERS, INC.
9360 Glacier Highway Ste 100
Juneau, Alaska 99801
Phone: 907-586-2093
Fax: 907-586-2099
www.pnd-anc.com
DESIGN: PND CHECKED: CRS
DRAWN: PND APPROVED: CRS
SCALE: SCALE IN FEET
0 40 80 FT.
DATE: FEB. 2012
SITKA, ALASKA
SITKA HARBOR SYSTEM
MASTER PLAN
SHEET TITLE:
THOMSEN HARBOR
FLOAT PLAN
PND PROJECT NO. 112070.01
DWG. FILE:
1
SHEET 1 OF 2



TIDAL DATA

EHW	14.6'
EHT	12.7'
MHHW	9.9'
MHW	9.1'
MLLW	0.0'
ELW	-4.0'

CITY AND BOROUGH OF SITKA — DECEMBER 2, 1971

REVISIONS

REV.	DATE	DESCRIPTION	DWN.	CKD.	APP.

PND ENGINEERS, INC.
9360 Glacier Highway Ste 100
Juneau, Alaska 99801
Phone: 907-586-2093
Fax: 907-586-2099
www.pnd-anc.com

DESIGN: PND CHECKED: CRS
DRAWN: PND APPROVED: CRS
SCALE: SCALE IN FEET 0 20 40 FT.

DATE: FEB. 2012

SITKA, ALASKA
SITKA HARBOR SYSTEM
MASTER PLAN

SHEET TITLE: **THOMSEN HARBOR UPLANDS**

PND PROJECT NO.: 112070.01 DWG. FILE:

SHEET 2 OF 2

2 THOMSEN HARBOR
IN-KIND REPLACEMENT BUDGETARY ESTIMATE
Prepared By: PND Engineers, Inc., February 2012

Item	Item Description	Units	Quantity	Unit Cost	Amount
2A HARBOR FACILITIES					
1	Mobilization	LS	All Reqd	10%	$602,084
2	Demolition & Disposal	LS	All Reqd	$250,000	$250,000
3	Domestic Water & Fire System	LS	All Reqd	$340,000	$340,000
4	Construction Surveying	LS	All Reqd	$30,000	$30,000
5	Timber Approach Dock	EA	1	$65,000	$65,000
6	80' Covered Aluminum Gangway	EA	1	$120,000	$120,000
7	Signage	LS	All Reqd	$5,000	$5,000
8	Main Float 10' x 646'	SF	6460	$80	$516,800
9	Float A, 10' x 272'	SF	2720	$80	$217,600
10	Float B, 10' x 356'	SF	3560	$80	$284,800
11	Float C, 10' x 356'	SF	3560	$80	$284,800
12	Float D, 8' x 356'	SF	2848	$80	$227,840
13	Float E, 8' x 285'	SF	2280	$80	$182,400
14	End Float B, 10' x 82'	SF	820	$80	$65,600
15	End Float C, 10' x 74'	SF	740	$80	$59,200
16	End Float D, 10' x 56'	SF	560	$80	$44,800
17	Gangway Landing Float, 20' x 20'	EA	1	$40,000	$40,000
18	3' x 20' Finger Float	EA	24	$6,000	$144,000
19	4' x 24' Finger Float	EA	40	$9,600	$384,000
20	4' x 32' Finger Float	EA	27	$12,800	$345,600
21	5' x 40' Finger Float	EA	13	$20,000	$260,000
22	10' x 10' Transformer Float	EA	3	$10,000	$30,000
23	Steel Pipe Pile, 12" dia. x 0.500" thick	EA	37	$7,500	$277,500
24	Steel Pipe Pile, 16" dia. x 0.500" thick	EA	58	$9,000	$522,000
25	Predrilled Pile Sockets	EA	34	$5,000	$170,000
26	Anodes	EA	190	$1,500	$285,000
27	Supply Floatation Billets	EA	50	$150	$7,500
28	Install Floatation Billets	EA	50	$300	$15,000
29	Life Ring Cabinet and Base	EA	12	$1,000	$12,000
30	Fire Extinguisher with Hose Cabinet and Base	EA	12	$1,200	$14,400
31	Electrical System	LS	All Reqd	$800,000	$800,000
32	Spare Electrical Equipment	LS	All Reqd	$20,000	$20,000
	ESTIMATED CONSTRUCTION BID PRICE				**$6,622,924**
	CONTINGENCY (15%)				**$993,439**
	ENVIRONMENTAL PERMITTING, FINAL DESIGN, CONTRACT ADMINISTRATION, CONSTRUCTION INSPECTION & OTHER INDIRECT COSTS (20%)				**$1,324,585**
	TOTAL RECOMMENDED PROJECT BUDGET				**$8,940,947**

Item	Item Description	Units	Quantity	Unit Cost	Amount
2B UPLAND ACCESS AND PARKING					
1	Mobilization	LS	All Reqd	10%	$43,000
2	Excavation & Demolition & Disposal	CY	1500	$15	$22,500
3	Shot Rock Borrow	CY	700	$35	$24,500
4	Base Course, Grading D-1	CY	600	$50	$30,000
5	Storm Drain System	LS	All Reqd	$40,000	$40,000
6	3" ACP Paving	SY	3600	$55	$198,000
7	Painting & Striping	LS	All Reqd	$7,500	$7,500
8	Construction Surveying	LS	All Reqd	$7,500	$7,500
9	Electrical/Lighting System	LS	All Reqd	$100,000	$100,000
	ESTIMATED CONSTRUCTION BID PRICE				**$473,000**
	CONTINGENCY (15%)				**$70,950**
	ENVIRONMENTAL PERMITTING, FINAL DESIGN, CONTRACT ADMINISTRATION, CONSTRUCTION INSPECTION & OTHER INDIRECT COSTS (20%)				**$94,600**
	TOTAL RECOMMENDED PROJECT BUDGET				**$638,550**
2C UPLAND BUILDING FACILITIES - HARBOR OFFICE					
1	Mobilization	LS	All Reqd	10%	$25,032
2	Demolition & Disposal	LS	All Reqd	$30,000	$30,000
3	Harbor Office	LS	All Reqd	$220,320	$220,320
	ESTIMATED CONSTRUCTION BID PRICE				**$275,352**
	CONTINGENCY (15%)				**$41,303**
	ENVIRONMENTAL PERMITTING, FINAL DESIGN, CONTRACT ADMINISTRATION, CONSTRUCTION INSPECTION & OTHER INDIRECT COSTS (20%)				**$55,070**
	TOTAL RECOMMENDED PROJECT BUDGET				**$371,725**
2D UPLAND BUILDING FACILITIES - THOMSEN HARBOR RESTROOM					
1	Mobilization	LS	All Reqd	10%	$14,380
2	Demolition & Disposal	LS	All Reqd	$25,000	$25,000
3	Restroom	LS	All Reqd	$118,800	$118,800
	ESTIMATED CONSTRUCTION BID PRICE				**$158,180**
	CONTINGENCY (15%)				**$23,727**
	ENVIRONMENTAL PERMITTING, FINAL DESIGN, CONTRACT ADMINISTRATION, CONSTRUCTION INSPECTION & OTHER INDIRECT COSTS (20%)				**$31,636**
	TOTAL RECOMMENDED PROJECT BUDGET				**$213,543**

SEALING COVE HARBOR

Sealing Cove Harbor was designed by the State of Alaska, Department of Transportation & Public Facilities, in 1982 and was constructed in 1983. The water and fire system was replaced in 2006.

The harbor provides moorage for approximately 390 vessels ranging in lengths from approximately 16-ft to 40-ft. The moorage system consists of an 8-ft wide concrete headwalk float which gives access to six, 8-ft wide concrete mainwalk floats, each supporting concrete finger floats of varying lengths. The float system is anchored by both steel pipe and treated timber piles. Access to the headwalk float is provided by two, 16-ft x 40-ft concrete approach docks, each of which supports a 6-ft x 65-ft long steel gangway. The floats are equipped with power, lighting, water, and fire utilities.

Observations

In general, the current overall condition of the harbor is good and it appears to be functioning as a competent facility. None of the observations made present immediate structural concerns. However, the harbor is nearly three decades old and will begin to deteriorate at an increased rate as it approaches the end of its useful design life. Rapid deterioration will occur due to timber walers lacking sufficient preservative treatment and the age of the concrete float units. The following conditions were observed:

Approach Dock:
The concrete approach docks are generally in good condition. The steel pipe piles and piles caps are in good condition with galvanized coatings in-tact, however significant corrosion of welded area at the pile to pile cap connections was observed. The concrete girders had areas of spalling concrete that have been repaired and sections of concrete on the underside of the deck panels have broken off.

Gangways:
The general condition of the gangways is good. The primary concern regarding the gangways is their length. 65-ft gangways are no longer permitted in new construction due to the steep gradient that is created during low tides. 80-ft long gangways are required to meet current American Disabilities Act (ADA) standards.

Moorage Floats:
The moorage floats are generally in fair condition. The concrete decking is spalled in many areas and hairline cracks were evident throughout the facility. The timbers were found to be structurally sound and generally in fair condition. No wood preservative treatment appears to be remaining.

Piles:
Both the steel pipe and timber piles show signs of age but generally appear structurally sound and in fair condition.

Utilities:
The harbor's water and fire systems were replaced in 2006. The harbor water system consists of a float mounted HDPE water main that is connection to the City's main water service. The water pedestals consist of insulated PVC standpipes. All standpipes were in working order, however are known to freeze due to the lack of an adequate heat trace system.

Uplands Access and Parking:
The uplands area at Sealing Cove Harbor consists of approximately 2.0 acres of asphalt surfaced parking area and provides parking for approximately 225 vehicles. High mast light poles provide lighting throughout the parking area. The upland parking facilities are generally in fair to good condition with an estimated remaining safe and usable service life of approximately 10 years.

Conclusions

While the general, overall condition of the facility is good, the harbor is nearly 30 years old, and will begin to deteriorate more rapidly as it approaches the end of its useful life. It is estimated that the harbor moorage system has a remaining safe and usable service life of approximately 10 years.

SEALING COVE HARBOR PHOTOGRAPH LOG

Approach Dock & Gangway

Gangway

Pile to Pile Cap

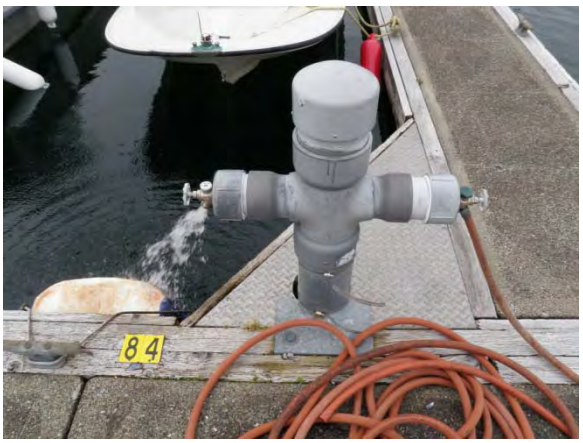
Approach Dock

Main Floats

Main Floats

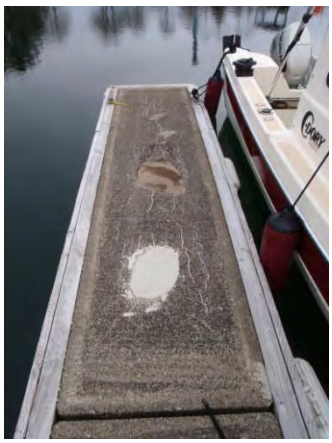
Steel Pipe Pile

Headwalk/Mainwalk Connection



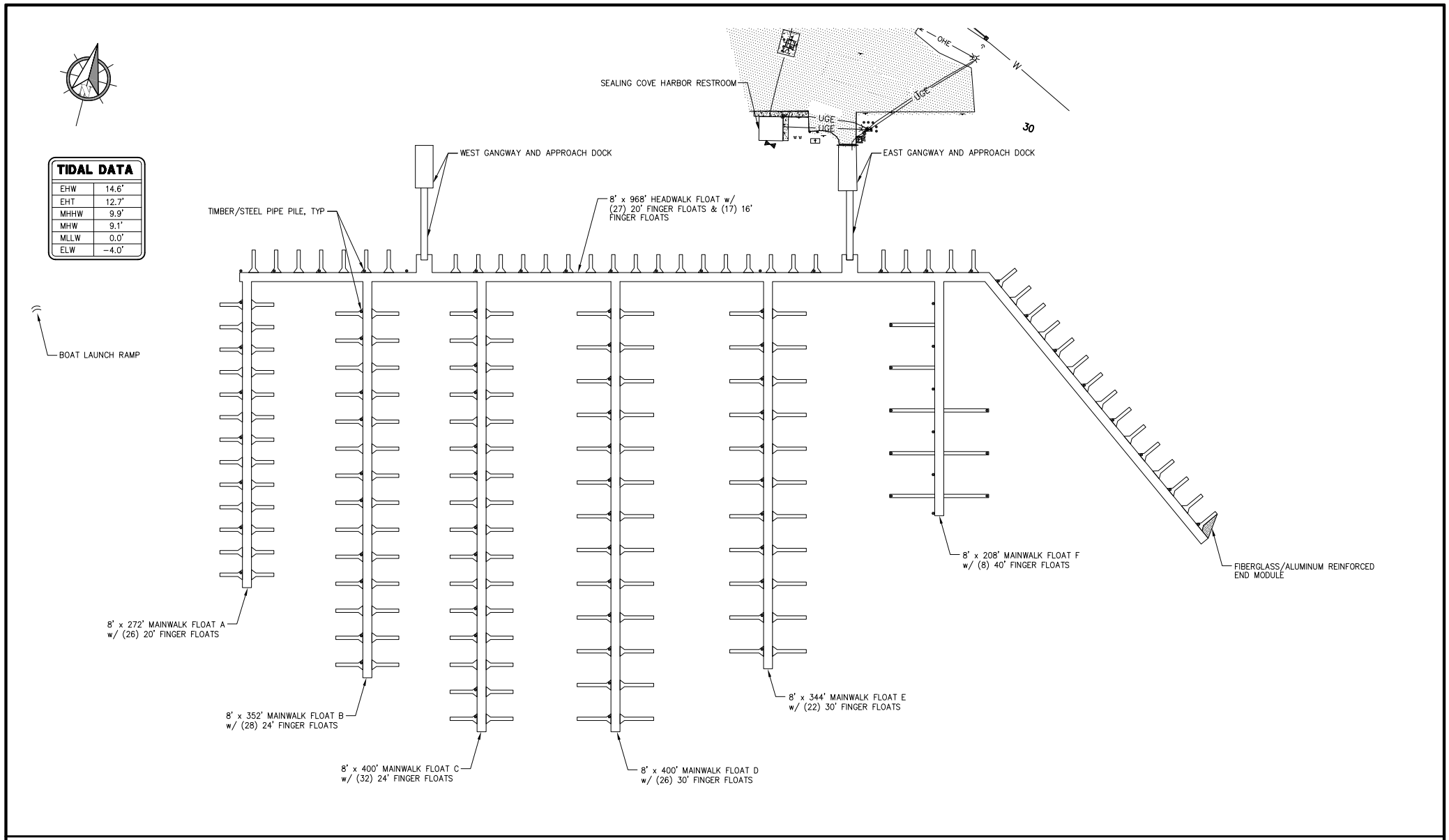
Water Service

Damaged Finger Float



Finger Float

Finger Float



CITY AND BOROUGH OF SITKA
DECEMBER 2, 1971

REVISIONS

REV.	DATE	DESCRIPTION	DWN.	CKD.	APP.

PND ENGINEERS, INC.
9360 Glacier Highway Ste 100
Juneau, Alaska 99801
Phone: 907-586-2093
Fax: 907-586-2099
www.pnd-anc.com

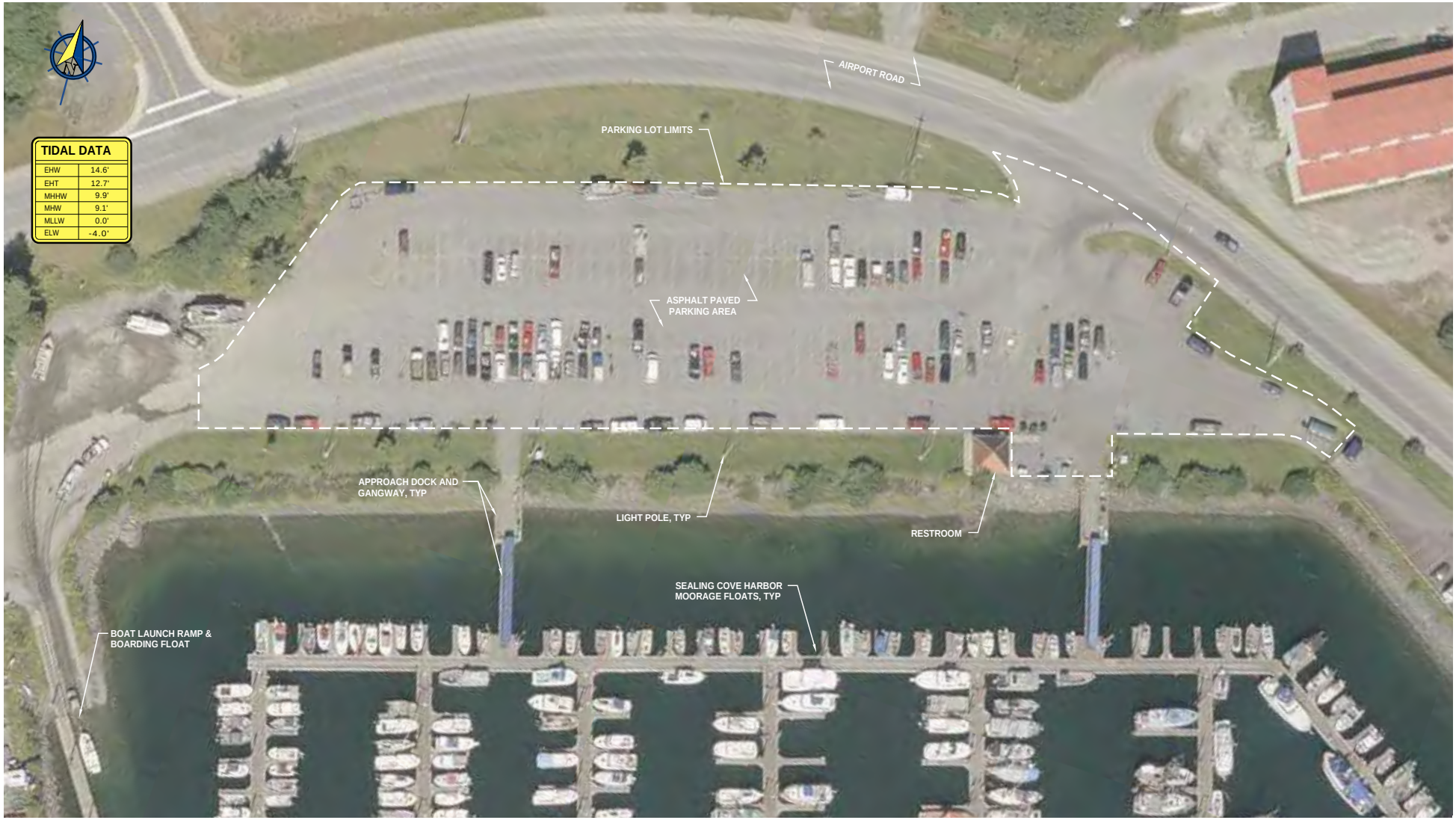
DESIGN: PND CHECKED: CRS
DRAWN: PND APPROVED: CRS
SCALE: SCALE IN FEET 0 40 80 FT.
DATE: FEB. 2012

SITKA, ALASKA
SITKA HARBOR SYSTEM MASTER PLAN

SHEET TITLE: **SEALING COVE HARBOR FLOAT PLAN**

PND PROJECT NO. 112070.01 DWG. FILE

1
SHEET 1 OF 2



CITY AND BOROUGH OF SITKA
DECEMBER 2, 1971

REVISIONS

REV.	DATE	DESCRIPTION	DWN.	CKD.	APP.

PND ENGINEERS, INC.
9360 Glacier Highway Ste 100
Juneau, Alaska 99801
Phone: 907-586-2093
Fax: 907-586-2099
www.pnd-anc.com

DESIGN: PND CHECKED: CRS
DRAWN: PND APPROVED: CRS
SCALE: SCALE IN FEET 0 40 80 FT.

DATE: FEB. 2012

SITKA, ALASKA
SITKA HARBOR SYSTEM
MASTER PLAN

SHEET TITLE: **SEALING COVE HARBOR UPLANDS**

PND PROJECT NO.: 112070.01 DWG. FILE:

SHEET 2 OF 2

3 SEALING COVE HARBOR
IN KIND REPLACEMENT BUDGETARY ESTIMATE
Prepared By: PND Engineers, Inc., February 2012

Item	Item Description	Units	Quantity	Unit Cost	Amount
3A HARBOR MAINTENANCE REPAIRS					
1	Repair Approach Dock Girders & Pile Caps	LS	All Reqd	$10,000	$10,000
2	Supply & Install Coated Polystyrene Billets	EA	125	$500	$62,500
3	Flotation Assembly for Gangway Landing Float	EA	2	$25,000	$50,000
4	Replace Damaged Walers & Thru-Rods	LF	500	$150	$75,000
5	Replace Damaged Bullrail & Scupper Blocks	LF	500	$60	$30,000
6	Replace Damaged Rubboard	LF	500	$25	$12,500
7	Anodes	LS	All Reqd	$50,000	$50,000
8	Resurface Concrete Float Modules	EA	40	$1,500	$60,000
9	Power, Lighting, Electrical Improvements	LS	All Reqd	$150,000	$150,000
	ESTIMATED CONSTRUCTION BID PRICE				**$500,000**
	CONTINGENCY (20%)				**$100,000**
	ENVIRONMENTAL PERMITTING, FINAL DESIGN, CONTRACT ADMINISTRATION, CONSTRUCTION INSPECTION & OTHER INDIRECT COSTS (20%)				**$100,000**
	TOTAL RECOMMENDED PROJECT BUDGET				**$700,000**
3B HARBOR FACILITIES					
1	Mobilization	LS	All Reqd	10%	$722,536
2	Demolition & Disposal	LS	All Reqd	$350,000	$350,000
3	Domestic Water & Fire System	LS	All Reqd	$425,000	$425,000
4	Construction Surveying	LS	All Reqd	$35,000	$35,000
5	Concrete Approach Dock	EA	2	$150,000	$300,000
6	80' Covered Aluminum Gangway	EA	2	$120,000	$240,000
7	Signage	LS	All Reqd	$10,000	$10,000
8	Headwalk Float, 8' x 968'	SF	7,744	$80	$619,520
9	Float A, 8' x 272'	SF	2,176	$80	$174,080
10	Float B, 8' x 352'	SF	2,816	$80	$225,280
11	Float C, 8' x 400'	SF	3,200	$80	$256,000
12	Float D, 8' x 400'	SF	3,200	$80	$256,000
13	Float E, 8' x 344'	SF	2,752	$80	$220,160
14	Float F, 8' x 208'	SF	1,664	$80	$133,120
15	3' x 17' Finger Float	EA	70	$5,100	$357,000
16	4' x 24' Finger Float	EA	60	$9,600	$576,000
17	4' x 32' Finger Float	EA	48	$12,800	$614,400
18	5' x 40' Finger Float	EA	8	$20,000	$160,000
19	20' x 20' Gangway Landing Float	EA	2	$40,000	$80,000
20	10' x 12' Electrical Float	EA	4	$12,000	$48,000
21	Steel Pipe Pile, 12" dia. x 0.500" thick	EA	100	$7,500	$750,000
22	Predrilled Pile Sockets	EA	25	$4,500	$112,500
23	Anodes	EA	200	$1,500	$300,000
24	Supply Flotation Billet	EA	50	$150	$7,500
25	Install Flotation Billet	EA	50	$300	$15,000
26	Life Ring Cabinet and Base	EA	12	$1,000	$12,000
27	Fire Extinguisher with Hose Cabinet and Base	EA	12	$1,200	$14,400
28	Self Rescue Ladders	EA	24	$600	$14,400
29	Electrical System	LS	All Reqd	$900,000	$900,000
30	Spare Electrical Equipment	LS	All Reqd	$20,000	$20,000
	ESTIMATED CONSTRUCTION BID PRICE				**$7,947,896**
	CONTINGENCY (15%)				**$1,192,184**
	ENVIRONMENTAL PERMITTING, FINAL DESIGN, CONTRACT ADMINISTRATION, CONSTRUCTION INSPECTION & OTHER INDIRECT COSTS (20%)				**$1,589,579**
	TOTAL RECOMMENDED PROJECT BUDGET				**$10,729,660**

Item	Item Description	Units	Quantity	Unit Cost	Amount
3C UPLAND ACCESS AND PARKING					
1	Mobilization	LS	All Reqd	10%	$50,400
2	Excavation and Demolition & Disposal	CY	2250	$15	$33,750
3	Base Course, Grading D-1	CY	1500	$50	$75,000
4	Storm Drain System	LS	All Reqd	$80,000	$80,000
5	3" ACP Paving	SY	3050	$55	$167,750
6	Painting & Striping	LS	All Reqd	$12,500	$12,500
7	Construction Surveying	LS	All Reqd	$10,000	$10,000
8	Electrical/Lighting System	LS	All Reqd	$125,000	$125,000
	ESTIMATED CONSTRUCTION BID PRICE				**$554,400**
	CONTINGENCY (15%)				**$83,160**
	ENVIRONMENTAL PERMITTING, FINAL DESIGN, CONTRACT ADMINISTRATION, CONSTRUCTION INSPECTION & OTHER INDIRECT COSTS (20%)				**$110,880**
	TOTAL RECOMMENDED PROJECT BUDGET				**$748,440**
3D UPLAND BUILDING FACILITIES - SEALING COVE HARBOR RESTROOM					
1	Mobilization	LS	All Reqd	10%	$18,376
2	Demolition & Disposal	LS	All Reqd	$25,000	$25,000
3	Restroom	LS	All Reqd	$158,760	$158,760
	ESTIMATED CONSTRUCTION BID PRICE				**$202,136**
	CONTINGENCY (15%)				**$30,320**
	ENVIRONMENTAL PERMITTING, FINAL DESIGN, CONTRACT ADMINISTRATION, CONSTRUCTION INSPECTION & OTHER INDIRECT COSTS (20%)				**$40,427**
	TOTAL RECOMMENDED PROJECT BUDGET				**$272,884**

Note: Costs for dredging or entrance protection systems are not included in this estimate.

ELIASON HARBOR

Eliason Harbor, once referred to as New Thomsen Harbor, was designed by the State of Alaska, Department of Transportation & Public Facilities, in two phases. Both phases were designed in 1996, with phase 1 construction beginning in 1996 and phase 2 construction completed in 1998.

The harbor provides permanent moorage for approximately 242 vessels ranging in lengths from 32-ft to 150-ft. The harbor also contains side tie moorage for transient vessels. The moorage system consists of a 12-ft wide timber headwalk float which provides access to ten, 10-ft wide timber mainwalk floats, each supporting timber finger floats of varying lengths. The float system is anchored in place by steel pipe piles. Vehicular access to a 50' x 152' drive down float, which also serves as the access point to the headwalk, is provided by an 11' x 100' vehicular loading ramp. Pedestrian access to the drive down float is also provided by a 6' x 100' gangway adjacent to the loading ramp. The floats are equipped with power, lighting, water, and fire utilities.

Observations

Drive Down Float:
The drive down float is a high use facility and shows signs of wear, but is otherwise performing adequately. The knots within the wood of the 2x12 wear decking are raised on the surface which is a sign of its age and high level of use. In addition to the exposed knots, there are many locations where the decking is split and has become rotten. The timber bullrail and rubstrips are significantly worn from mooring lines and loading activities.

Vehicle Transition Bridge and Gangway:
The galvanized steel transition bridge and pedestrian gangway are in fair condition with no significant noted deficiencies, although transition assemblies have received heavy wear from vehicle tires and impact damage.

Main Floats:
The overall condition of the main floats is fair to good. The steel hinge connections in this harbor are an improved design over what is commonly found throughout most of Sitka's older harbors. The hinge bolts are lined with a UHMW sleeve so that steel on steel wearing does not occur, and as a result are not excessively worn and loose. The substructure timber elements are in fair to good condition and creosote treatment is visible throughout. As with many of Sitka's other harbors, a freeboard level that is high enough to keep the structural timbers from being submerged will help to maintain and extend the harbors lifespan. The harbor department recently installed floatation tubs on float 4 and will soon be installing tubs on float 2.

Piles:
The steel pipe piles are in fair to good condition.

Finger Floats:
The majority of the finger floats are in fair condition. Some are twisted and listing, but at this point the concern is mostly an aesthetic issue, as the listing is not so severe as to create a safety concern.

Breakwater Float:
The log reinforced breakwater floats that surround the perimeter of the harbor floats are of more robust design than the timber mainwalk floats and they are in fair condition. The float slightly lists towards the 32-ft long finger floats on the south and freeboard has dropped to the point where the timber support sills are now submerged.

Water System:
The harbor water system consists of a float mounted HDPE water main which feeds float mounted pedestals. The pedestals are equipped with two 3/4" garden hose type bibs and one 1 - 1/2" fire hose connection. The pedestals appeared to be in working order and were being maintained by the harbor department at the time of the condition inventory.

Upland Access and Parking:
The upland parking area at Eliason Harbor consists of approximately 1.9 acres of asphalt surfaced parking lot and provides parking for approximately 175 vehicles. Light poles provide adequate lighting throughout the parking area. The upland parking facilities are in fair condition with an estimated remaining safe and usable service life of approximately 10 years, provided interim patching and crack sealing is soon accomplished.

Conclusions

Although it does show signs of age, Eliason Harbor is relatively new and is in general overall good condition. It is estimated that the moorage system has a remaining safe and usable service life of approximately 20 years.

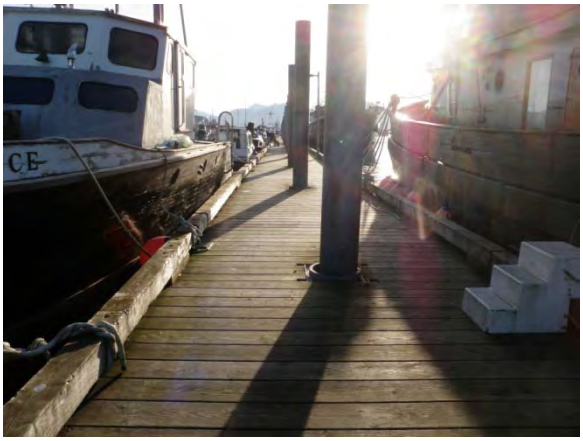
ELIASON HARBOR PHOTOGRAPH LOG

Vehicle Transfer Bridge

Pedestrian Gangway

Drive Down Float

Drive Down Float

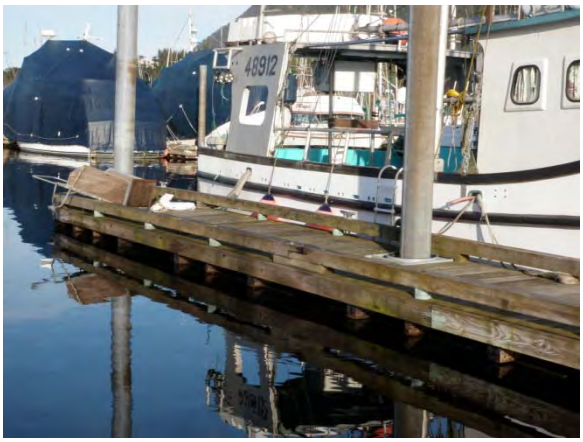


Headwalk

Mainwalk Float

Submerged Mainwalk Sills

Finger Float

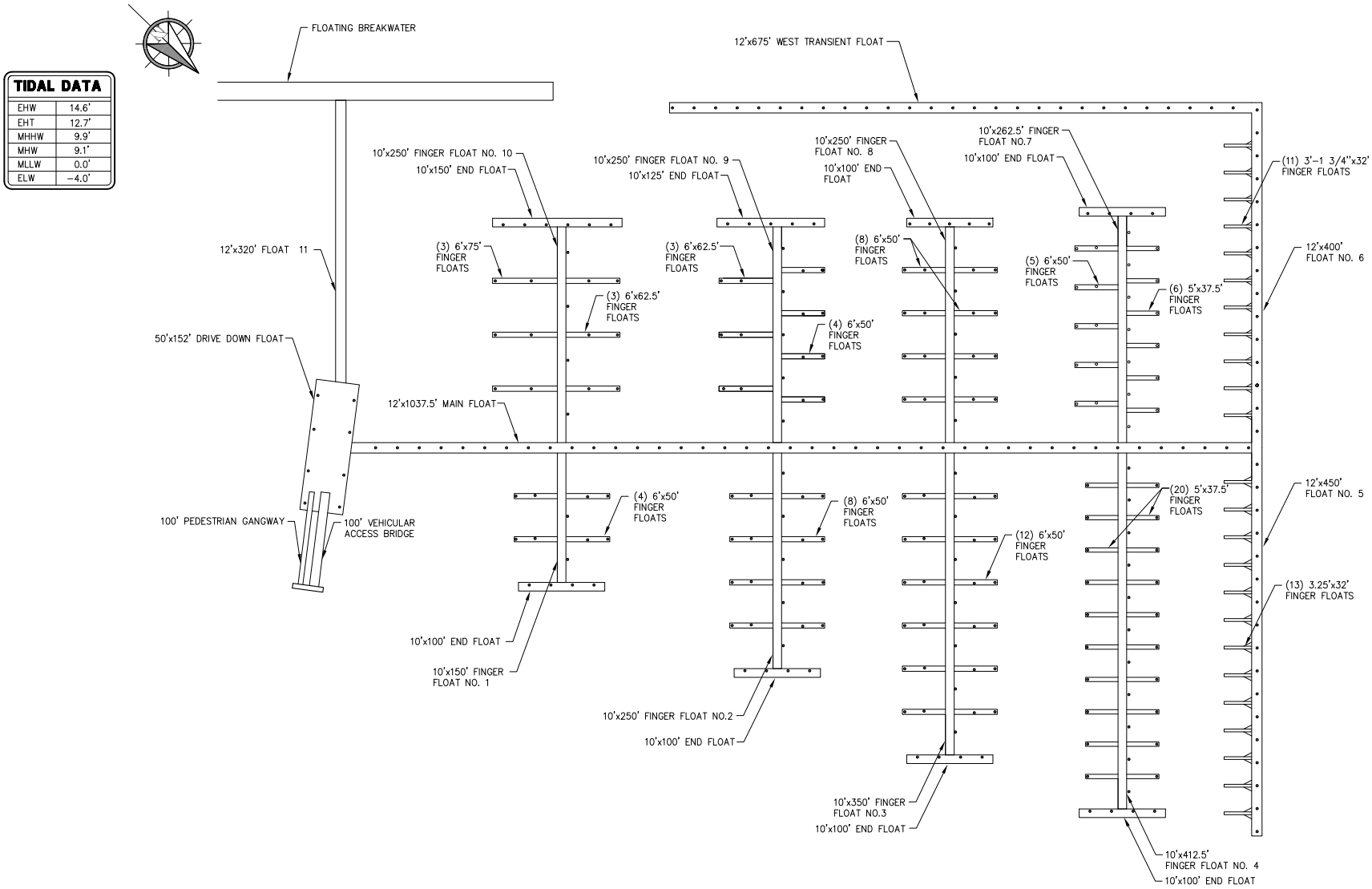


Finger Float

Hinge Connection Hardware

Breakwater Float

Hose Bibb



CITY AND BOROUGH OF SITKA — DECEMBER 2, 1971

REVISIONS

REV.	DATE	DESCRIPTION	DWN.	CKD.	APP.

PND ENGINEERS, INC.
9360 Glacier Highway Ste 100
Juneau, Alaska 99801
Phone: 907-586-2093
Fax: 907-586-2099
www.pnd-anc.com

DESIGN: PND CHECKED: CRS
DRAWN: PND APPROVED: CRS
SCALE: SCALE IN FEET 0 60 120 FT.
DATE: FEB. 2012

SITKA, ALASKA
SITKA HARBOR SYSTEM MASTER PLAN

SHEET TITLE: **ELIASON HARBOR FLOAT PLAN**

PND PROJECT NO. 112070.01 DWG. FILE.

SHEET 1 OF 2

TIDAL DATA

EHW	14.6'
EHT	12.7'
MHHW	9.9'
MHW	9.1'
MLLW	0.0'
ELW	-4.0'

CITY AND BOROUGH OF SITKA — DECEMBER 2, 1971

REVISIONS

REV.	DATE	DESCRIPTION	DWN.	CKD.	APP.

PND ENGINEERS, INC.
9360 Glacier Highway Ste 100
Juneau, Alaska 99801
Phone: 907-586-2093
Fax: 907-586-2099
www.pnd-anc.com

DESIGN: PND CHECKED: CRS
DRAWN: PND APPROVED: CRS
SCALE: SCALE IN FEET 0 30 60 FT.
DATE: FEB. 2012

SITKA, ALASKA
SITKA HARBOR SYSTEM MASTER PLAN

SHEET TITLE: **ELIASON HARBOR UPLANDS**
PND PROJECT NO.: 112070.01 DWG. FILE:
SHEET 2 OF 2

4 ELIASON HARBOR
IN KIND REPLACEMENT BUDGETARY ESTIMATE
Prepared By: PND Engineers, Inc., February 2012

Item	Item Description	Units	Quantity	Unit Cost	Amount
4A HARBOR FACILITIES					
1	Mobilization	LS	All Reqd	10%	$1,621,710
2	Demolition & Disposal	LS	All Reqd	$500,000	$500,000
3	Domestic Water & Fire System	LS	All Reqd	$600,000	$600,000
4	Construction Surveying	LS	All Reqd	$50,000	$50,000
5	100' Covered Aluminum Gangway	EA	1	$150,000	$150,000
6	Signage	LS	All Reqd	$15,000	$15,000
7	100' Transition Bridge	EA	1	$425,000	$425,000
8	50' x 152' Drive Down Float	SF	7600	$250	$1,900,000
9	Breakwater Access Float 12' x 320'	SF	3840	$80	$307,200
10	Headwalk Float 10' x 1037.5'	SF	10375	$80	$830,000
11	Float 1, 10' x 150'	SF	1500	$80	$120,000
12	Float 2, 10' x 250'	SF	2500	$80	$200,000
13	Float 3, 10' x 350'	SF	3500	$80	$280,000
14	Float 4, 10' x 412.5'	SF	4125	$80	$330,000
15	Float 5, 12' x 450' (Reinforced)	SF	5400	$120	$648,000
16	Float 6, 12' x 400' (Reinforced)	SF	4800	$120	$576,000
17	Float 7, 10' x 262.5'	SF	2625	$80	$210,000
18	Float 8, 10' x 250'	SF	2500	$80	$200,000
19	Float 9, 10' x 250'	SF	2500	$80	$200,000
20	Float 10, 10' x 250'	SF	2500	$80	$200,000
21	Float 11, 12' x 675' (Reinforced)	SF	8100	$120	$972,000
22	4' x 32' Finger Float	EA	24	$12,800	$307,200
23	5' x 37.5' Finger Float	EA	26	$18,750	$487,500
24	6' x 50' Finger Float	EA	41	$30,000	$1,230,000
25	8' x 62.5' Finger Float	EA	6	$50,000	$300,000
26	8' x 75' Finger Float	EA	3	$60,000	$180,000
27	10' x 150' End Float	EA	1	$120,000	$120,000
28	10' x 125' End Float	EA	1	$100,000	$100,000
29	10' x 100' End Float	EA	6	$80,000	$480,000
30	Steel Pipe Pile, 12" dia. x 0.500" thick	EA	250	$7,500	$1,875,000
31	Steel Pipe Pile, 16" dia. x 0.500" thick	EA	62	$9,000	$558,000
32	Predrilled Pile Sockets (50% Est.)	EA	156	$5,000	$780,000
33	Anodes	EA	624	$1,500	$936,000
34	Supply Floatation Billet	EA	100	$150	$15,000
35	Install Floatation Billet	EA	100	$300	$30,000
36	Life Ring Cabinet and Base	EA	35	$1,000	$35,000
37	Fire Extinguisher with Hose Cabinet and Base	EA	35	$1,200	$42,000
38	Self Rescue Ladders	EA	47	$600	$28,200
39	Electrical System	LS	All Reqd	$1,400,000	$1,400,000
40	Spare Electrical Equipment	LS	All Reqd	$30,000	$30,000
	ESTIMATED CONSTRUCTION BID PRICE				**$19,268,810**
	CONTINGENCY (15%)				**$2,890,322**
	ENVIRONMENTAL PERMITTING, FINAL DESIGN, CONTRACT ADMINISTRATION, CONSTRUCTION INSPECTION & OTHER INDIRECT COSTS (20%)				**$3,853,762**
	TOTAL RECOMMENDED PROJECT BUDGET				**$26,012,894**

Item	Item Description	Units	Quantity	Unit Cost	Amount
4B INTERIM HARBOR ELECTRICAL REPLACEMENT					
1	Mobilization	LS	All Reqd	10%	$155,500
2	Demolition & Disposal	LS	All Reqd	$125,000	$125,000
3	Electrical System	LS	All Reqd	$1,400,000	$1,400,000
4	Spare Electrical Equipment	LS	All Reqd	$30,000	$30,000
	ESTIMATED CONSTRUCTION BID PRICE				**$1,710,500**
	CONTINGENCY (15%)				**$256,575**
	ENVIRONMENTAL PERMITTING, FINAL DESIGN, CONTRACT ADMINISTRATION, CONSTRUCTION INSPECTION & OTHER INDIRECT COSTS (20%)				**$342,100**
	TOTAL RECOMMENDED PROJECT BUDGET				**$2,309,175**
4C UPLAND ACCESS AND PARKING					
1	Mobilization	LS	All Reqd	10%	$66,875
2	Excavation and Demolition & Disposal	CY	1650	$15	$24,750
3	Base Course, Grading D-1	CY	1100	$50	$55,000
4	Storm Drain System	LS	All Reqd	$100,000	$100,000
5	3" ACP Paving	SY	6500	$55	$357,500
6	2" ACP Sidewalk	SY	350	$40	$14,000
7	Painting & Striping	LS	All Reqd	$10,000	$10,000
8	Construction Surveying	LS	All Reqd	$7,500	$7,500
9	Electrical/Lighting System	LS	All Reqd	$100,000	$100,000
	ESTIMATED CONSTRUCTION BID PRICE				**$735,625**
	CONTINGENCY (15%)				**$110,344**
	ENVIRONMENTAL PERMITTING, FINAL DESIGN, CONTRACT ADMINISTRATION, CONSTRUCTION INSPECTION & OTHER INDIRECT COSTS (20%)				**$147,125**
	TOTAL RECOMMENDED PROJECT BUDGET				**$993,094**
4D UPLAND BUILDING FACILITIES - ELIASON HARBOR RESTROOM					
1	Mobilization	LS	All Reqd	10%	$20,500
2	Demolition & Disposal	LS	All Reqd	$25,000	$25,000
3	Restroom	LS	All Reqd	$180,000	$180,000
	ESTIMATED CONSTRUCTION BID PRICE				**$225,500**
	CONTINGENCY (15%)				**$33,825**
	ENVIRONMENTAL PERMITTING, FINAL DESIGN, CONTRACT ADMINISTRATION, CONSTRUCTION INSPECTION & OTHER INDIRECT COSTS (20%)				**$45,100**
	TOTAL RECOMMENDED PROJECT BUDGET				**$304,425**

ANB HARBOR

ANB Harbor was designed by the State of Alaska, Department of Transportation & Public Facilities, and constructed in several phases. The initial construction occurred in 1956, although it appears that all of the remaining float components are from a 1974 reconstruction and additional subsequent phased reconstructions and finger replacements that occurred during the 1990's.

The harbor provides permanent moorage for 103 vessels ranging in lengths from approximately 17-ft to 50-ft. Access to the float system is provided by a 50-ft long steel gangway which is supported by a 160-ft timber approach dock connecting to Katlian St. The moorage system consists of a 10-ft wide timber headwalk float, which gives access to three 10-ft wide timber mainwalk floats, each supporting timber finger floats of varying lengths. A 12-ft wide timber breakwater float is attached to the end of float 2. The float system is anchored in place by both steel pipe and timber piles. The floats are equipped with power, lighting, water, and fire utilities.

Observations

Approach Dock:
Overall the timber approach dock is in fair condition. The decking and handrails are weathered and show signs of wear, but appear to be structurally sound. Cross bracing and support piles were not observed due to the tidal levels at the time of the inspection. Previous recent reports indicate that the dock support timbers are sound.

Gangway:
The general condition of the gangway is fair to good. The primary concern regarding the gangway is its length. 50-ft gangways are no longer permitted in new construction due to the steep gradient that is created during low tides. 80-ft long gangways are required to meet current American Disabilities Act (ADA) standards.

Main Floats:
The overall condition of the main floats is fair to poor. Harbor staff stated that the deckboards continually come loose from the support sills. Since the structural framing is no longer sufficient enough to hold the nails then it is most likely experiencing some levels of rot. The light poles and majority of the various utilities that are mounted to the deck are not made with structurally sufficient connections and are extremely loose and flimsy.

Piles:
The majority of the timber piles are in fair condition. Many are worn from rubbing against the steel pile hoops. Most of the piles do not have top protection, and as a result have vegetation growing out of the pile tops, which is a sure sign of rot in the upper portion of the pile. The steel pipe piles installed throughout harbor are mostly in fair to good condition. Some rust was observed through the galvanized coatings, but no pitting or section loss was observed.

Finger Floats:
The majority of the finger floats are in fair to poor condition. The 3' x 17' finger floats attached to the headwalk have only a small amount of freeboard remaining. The live load capacity has diminished to the point where the end of the float nearly submerges when an average sized person stands at the end of the float. The finger floats attached to floats 1, 2, and 3 are generally in better condition but many are twisted and listing.

Breakwater Float:
The breakwater float is of more stout construction than the timber mainwalk floats and is in fair condition. The deckboards are placed tight to each other and without a gap between them to allow water to drain from the surface of the deck. The result of which is pooling water and a slip hazard.

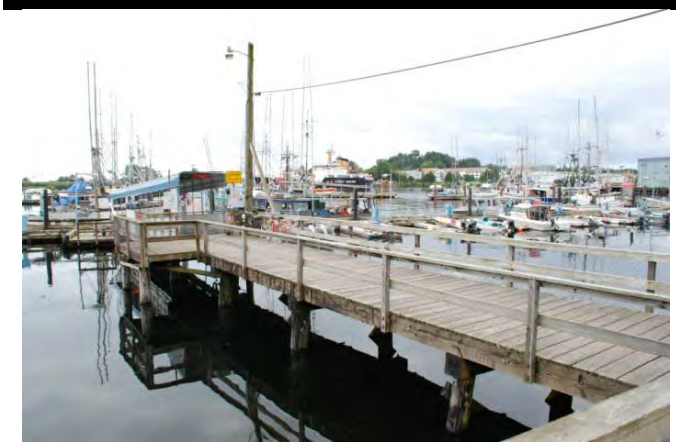
Water System:
The harbor water system consists of a float mounted HDPE water main which feeds float mounted pedestals. The pedestals are equipped with two 3/4" garden hose bibs and one 2" fire hose connection. Some of the pedestals were actively dripping or leaking water but all of them appeared to be functioning.

Upland Access and Parking:
The 0.5 acres of asphalt paved parking area provides parking for approximately 65 vehicles. The storm drain system appears to be somewhat inadequate as ponding water was observed. The upland parking facilities are in fair condition with an estimated remaining safe and usable service life of approximately 10 years, provided interim patching and crack sealing is soon accomplished.

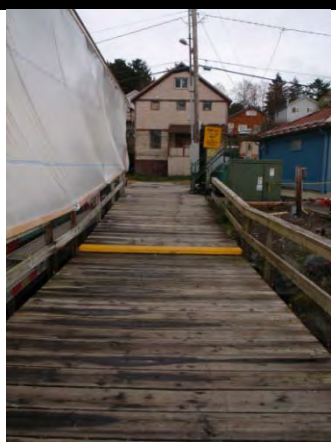
Conclusions

The overall condition of the moorage facility is fair to poor. While some harbor components remain in fair to good condition, overall there are many critical structural components in need of replacement. It is estimated that the harbor has a remaining safe and usable service life of 5 years.

ANB HARBOR PHOTOGRAPH LOG

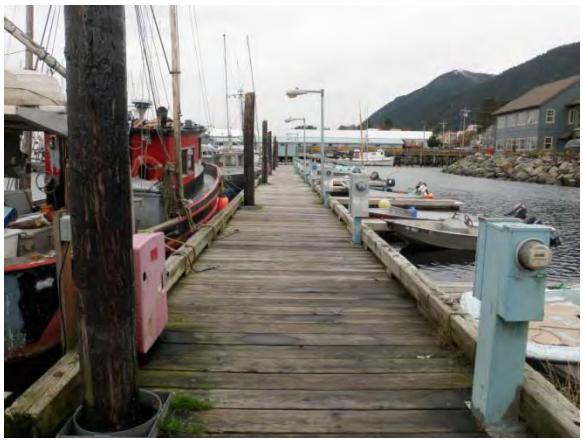


Timber Approach Dock



Timber Approach Dock

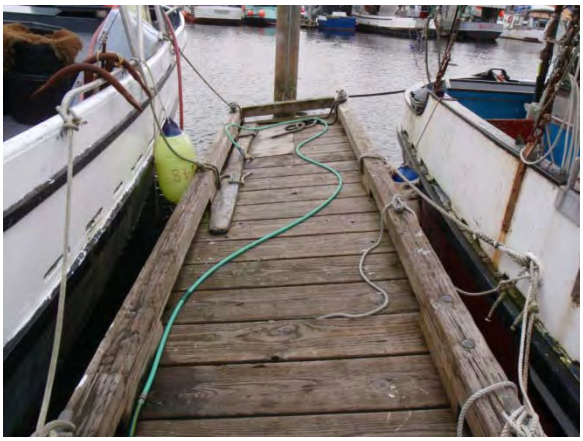
Covered Aluminum Gangway



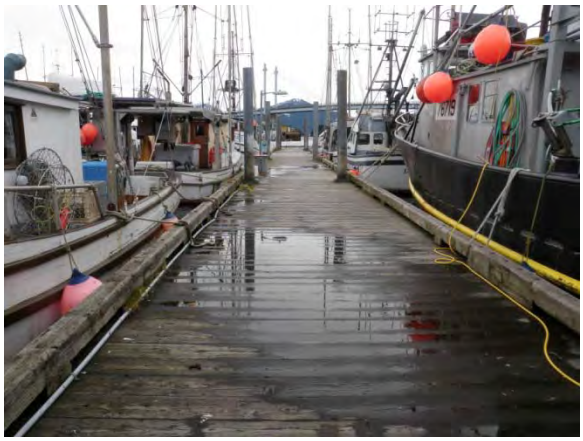
Headwalk Float

Main Float

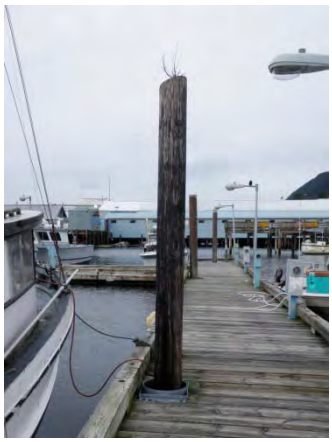
3'x17' Finger Float Submerging



Twisted & Listing Finger Float



Breakwater Float



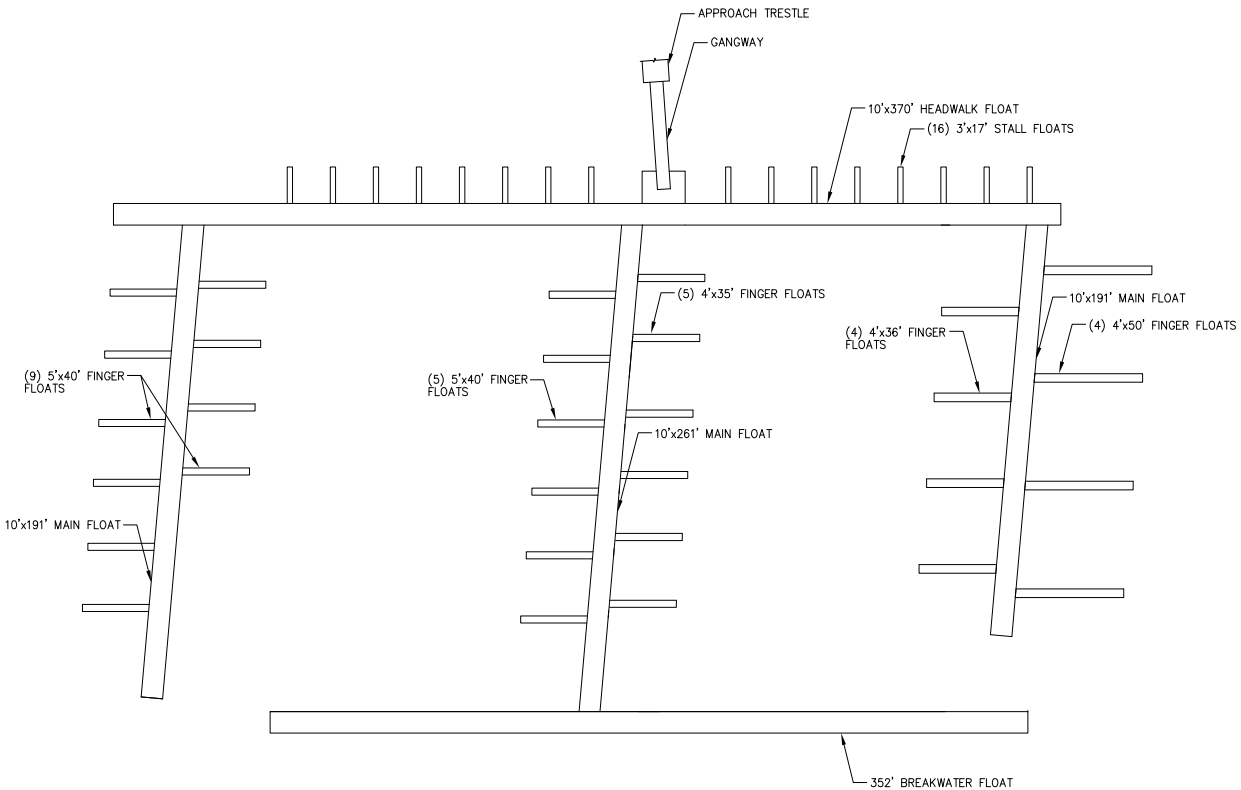
Timber Pile

Steel Pipe Pile

Broken Utility Mount

Water Service

TIDAL DATA	
EHW	14.6'
EHT	12.7'
MHHW	9.9'
MHW	9.1'
MLLW	0.0'
ELW	−4.0'



CITY AND BOROUGH OF SITKA
DECEMBER 2, 1971

REVISIONS

REV.	DATE	DESCRIPTION	DWN.	CKD.	APP.

PND ENGINEERS, INC.
9360 Glacier Highway Ste 100
Juneau, Alaska 99801
Phone: 907-586-2093
Fax: 907-586-2099
www.pnd-anc.com

DESIGN: PND CHECKED: CRS
DRAWN: PND APPROVED: CRS
SCALE: SCALE IN FEET 0 30 60 FT.

DATE: FEB. 2012

SITKA, ALASKA
SITKA HARBOR SYSTEM
MASTER PLAN

SHEET TITLE:
ANB HARBOR
FLOAT PLAN

PND PROJECT NO. 112070.01 DWG. FILE:

1
SHEET 1 OF 2

TIDAL DATA

EHW	14.6'
EHT	12.7'
MHHW	9.9'
MHW	9.1'
MLLW	0.0'
ELW	-4.0'

CITY AND BOROUGH OF SITKA — DECEMBER 2, 1971

REVISIONS

REV.	DATE	DESCRIPTION	DWN.	CKD.	APP.

PND ENGINEERS, INC.
9360 Glacier Highway Ste 100
Juneau, Alaska 99801
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DESIGN: PND CHECKED: CRS
DRAWN: PND APPROVED: CRS
SCALE: SCALE IN FEET 0 30 60 FT.
DATE: FEB. 2012

SITKA, ALASKA
SITKA HARBOR SYSTEM MASTER PLAN

SHEET TITLE: **ANB HARBOR UPLANDS**
PND PROJECT NO.: 112070.01 DWG. FILE:
SHEET 2 OF 2

5 ANB HARBOR
IN KIND REPLACEMENT BUDGETARY ESTIMATE
Prepared By: PND Engineers, Inc., February 2012

Item	Item Description	Units	Quantity	Unit Cost	Amount
5A HARBOR FACILITIES					
1	Mobilization	LS	All Reqd	10%	$555,230
2	Demolition & Disposal	LS	All Reqd	$200,000	$200,000
3	Bedrock Knob Removal	LS	All Reqd	$50,000	$50,000
4	Water Service to Meter Enclosure	LS	All Reqd	$25,000	$25,000
5	Domestic Water Meter Enclosure & Components	LS	All Reqd	$40,000	$40,000
6	Domestic Water System on Floats	LS	All Reqd	$225,000	$225,000
7	Furnish & Install Fire Hydrant Assembly	EA	1	$6,000	$6,000
8	Dry Fire Suppression System on Floats	LS	All Reqd	$150,000	$150,000
9	Construction Surveying	LS	All Reqd	$25,000	$25,000
10	Signage	LS	All Reqd	$7,500	$7,500
11	Timber Approach Dock	SF	1,040	$150	$156,000
12	80' Covered Aluminum Gangway	LS	All Reqd	$120,000	$120,000
13	Headwalk Float 12' x 440'	SF	5,280	$80	$422,400
14	Float 1, 12' x 230'	SF	2,760	$80	$220,800
15	Float 2, 12' x 275'	SF	3,300	$80	$264,000
16	Float 3, 12' x 190'	SF	2,280	$80	$182,400
17	Float 4 Breakwater, 14' x 350'	SF	4,900	$120	$588,000
18	Gangway Landing Float, 20' x 30'	SF	600	$100	$60,000
19	10' x 10' Transformer Float	EA	3	$10,000	$30,000
20	3' x 18' Finger Float	EA	16	$5,400	$86,400
21	5' x 36' Finger Float	EA	8	$18,000	$144,000
22	6' x 42' Finger Float	EA	15	$25,200	$378,000
23	6' x 50' Finger Float	EA	4	$25,000	$100,000
24	Temporary Access	LS	All Reqd	$25,000	$25,000
25	Steel Pipe Pile, 12" dia. x 0.500" thick	EA	14	$7,500	$105,000
26	Steel Pipe Pile, 16" dia. x 0.500" thick	EA	62	$9,000	$558,000
27	Mooring Pile Strut Frames	EA	9	$10,000	$90,000
28	Predrilled Pile Sockets (50% Est.)	EA	38	$5,000	$190,000
29	Second Attempt Pile Installation	EA	10	$2,500	$25,000
30	Pile Anodes	EA	156	$1,500	$234,000
31	Floatation Billets	EA	50	$500	$25,000
32	Life Ring Cabinet & Base	EA	10	$1,000	$10,000
33	Fire Extinguisher w/ Hose Cabinet & Base	EA	12	$1,200	$14,400
34	Self Rescue Ladders	EA	34	$600	$20,400
35	Electrical Support Assemblies	LS	All Reqd	$15,000	$15,000
36	Electrical System	LS	All Reqd	$750,000	$750,000
37	Spare Electrical Equipment	LS	All Reqd	$10,000	$10,000
	ESTIMATED CONSTRUCTION BID PRICE				**$6,107,530**
	CONTINGENCY (15%)				**$916,130**
	ENVIRONMENTAL PERMITTING, FINAL DESIGN, CONTRACT ADMINISTRATION, CONSTRUCTION INSPECTION & OTHER INDIRECT COSTS (20%)				**$1,221,506**
	TOTAL RECOMMENDED PROJECT BUDGET				**$8,245,166**

Item	Item Description	Units	Quantity	Unit Cost	Amount
5B UPLAND ACCESS AND PARKING					
1	Mobilization	LS	All Reqd	10%	$33,450
2	Excavation and Demolition & Disposal	LS	All Reqd	$18,000	$18,000
3	Base Course, Grading D-1	CY	400	$50	$20,000
4	Storm Drain System	LS	All Reqd	$40,000	$40,000
5	3" ACP Paving	SY	2400	$55	$132,000
6	Curb & Gutter	LF	175	$40	$7,000
7	Painting & Striping	LS	All Reqd	$10,000	$10,000
8	Construction Surveying	LS	All Reqd	$7,500	$7,500
9	Electrical/Lighting System	LS	All Reqd	$100,000	$100,000
	ESTIMATED CONSTRUCTION BID PRICE				**$367,950**
	CONTINGENCY (15%)				**$55,193**
	ENVIRONMENTAL PERMITTING, FINAL DESIGN, CONTRACT ADMINISTRATION, CONSTRUCTION INSPECTION & OTHER INDIRECT COSTS (20%)				**$73,590**
	TOTAL RECOMMENDED PROJECT BUDGET				**$496,733**
5C UPLAND BUILDING FACILITIES - ANB HARBOR RESTROOM					
1	Mobilization	LS	All Reqd	10%	$12,996
2	Demolition & Disposal	LS	All Reqd	$25,000	$25,000
3	Restroom	LS	All Reqd	$129,960	$129,960
	ESTIMATED CONSTRUCTION BID PRICE				**$167,956**
	CONTINGENCY (15%)				**$25,193**
	ENVIRONMENTAL PERMITTING, FINAL DESIGN, CONTRACT ADMINISTRATION, CONSTRUCTION INSPECTION & OTHER INDIRECT COSTS (20%)				**$33,591**
	TOTAL RECOMMENDED PROJECT BUDGET				**$226,741**

THOMSEN HARBOR BREAKWATER FLOAT

The Thomsen Harbor Breakwater Float was designed and installed by the State of Alaska, Department of Transportation & Public Facilities in 1973. The float system has undergone many repair and relocation projects as well as numerous maintenance repairs throughout nearly 40 years.

Substantial repair projects occurred in 1983 and in 1989 in which repairs were made to structural components including float connection hardware, transverse thru-rods, tensioning hardware and concrete decking.

The float was reoriented in 1996 in order to open the site which now holds Eliason Harbor. Prior to this point two breakwater segments ran perpendicular to each other and provided shelter for Thomsen Harbor. The float segments were reoriented to their current location which runs northwest along Sitka Channel. In 1998 the float was decked over with timber framing.

The breakwater float consists of fifteen 21-ft x 60-ft and one 21-ft x 30-ft post tensioned concrete float module units. Each unit is constructed of longitudinal shells with three transverse stiffener diaphragm units. The floats have been decked over with a timber frame complete with bullrail and rubstrips and currently serve for transient moorage. Replacement costs assume this facility will continue to operate as transient moorage rather than a floating wave attenuator. The float is equipped with water, fire, and electrical utilities.

Observations

Concrete Float:
Although most of the float is not visible from a topside inspection, the age of the float and discussions with harbor staff about the repair and maintenance procedures that have been performed elude to its generally poor condition. In 2011, harbor staff replaced approximately one-half of the transverse thru-rods that hold the float modules together, and it is likely that the remainder will fail in short time. The hinge connection hardware is heavily corroded. Anodes have been installed at the hinge assemblies in an effort to prevent further corrosion of the connection hardware. The anchors and chains that moor the float allow the float to drift up to 8-ft. This creates a problematic connection to the pile supported access float extended from Eliason Harbor.

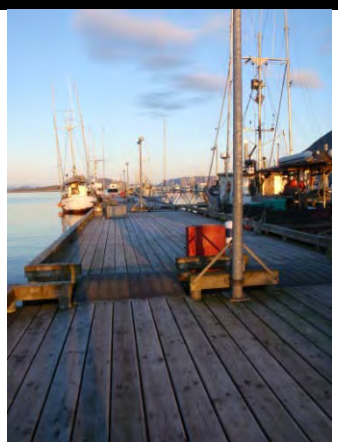
Timber Deck:
The timber deck is in fair condition, but the lengthwise orientation of the deck boards creates a slick surface when walking with the grain of the timbers when they are wet. Overall the timber deck is in fair condition.

Water Utilities:
The float water system consists of a float mounted HDPE water main which feeds float mounted pedestals. The pedestals are equipped with two 3/4" garden hose type bibs and one 2" fire hose connection.

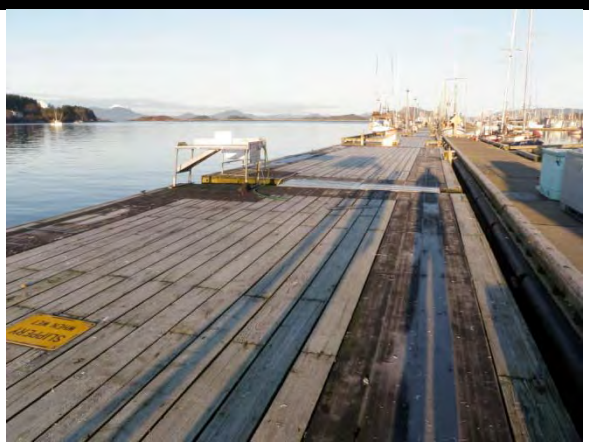
Conclusions

A dive inspection would be needed to fully assess the condition of the structural components below the water line including the float anchor chains and thru-rods. However the facility is aged and has already experienced failures of critical components. It is estimated that the facility has a remaining safe and usable service life of 5 years.

THOMSEN HARBOR BREAKWATER FLOAT PHOTOGRAPH LOG



Floating Breakwater

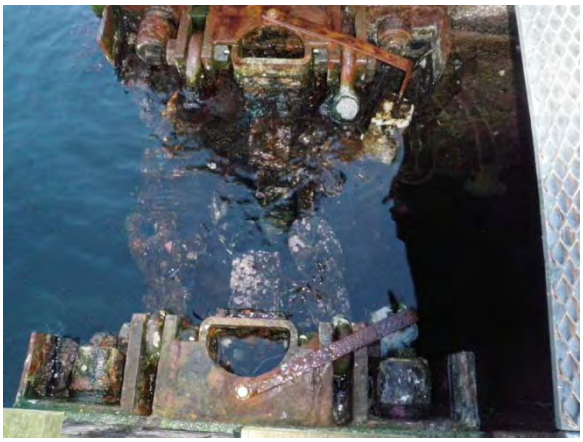


Floating Breakwater

Transition Bridge & Skid Plates

Tractor Tire

Connection Hardware



Connection Hardware

TIDAL DATA	
EHW	14.6'
EHT	12.7'
MHHW	9.9'
MHW	9.1'
MLLW	0.0'
ELW	-4.0'

CITY AND BOROUGH OF SITKA
DECEMBER 2, 1971

REVISIONS

REV.	DATE	DESCRIPTION	DWN.	CKD.	APP.

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DESIGN: PND CHECKED: CRS
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SCALE: SCALE IN FEET 0 50 100 FT.
DATE: FEB. 2012

SITKA, ALASKA
SITKA HARBOR SYSTEM
MASTER PLAN

SHEET TITLE: **THOMSEN HARBOR BREAKWATER FLOAT**
PND PROJECT NO.: 112070.01 DWG. FILE:
SHEET 1 OF 1

6 THOMSEN HARBOR BREAKWATER FLOAT IN KIND REPLACEMENT BUDGETARY ESTIMATE

Prepared By: PND Engineers, Inc., February 2012

Item	Item Description	Units	Quantity	Unit Cost	Amount
1	Mobilization	LS	All Reqd	10%	$333,210
2	Demolition & Disposal	LS	All Reqd	$150,000	$150,000
3	Domestic Water & Fire System	LS	All Reqd	$175,000	$175,000
4	Construction Surveying	LS	All Reqd	$15,000	$15,000
5	Signage	LS	All Reqd	$5,000	$5,000
6	12' x 930' Transient Float	SF	11160	$120	$1,339,200
7	Steel Pipe Pile, 16" dia. x 0.500" thick	EA	64	$9,000	$576,000
8	Pile Struts	EA	32	$10,000	$320,000
9	Predrilled Pile Sockets (50% Est.)	EA	32	$5,000	$160,000
10	Anodes	EA	128	$1,500	$192,000
11	Mainwalk Transition Assembly	LS	All Reqd	$10,000	$10,000
12	Life Ring Cabinet and Base	EA	8	$1,000	$8,000
13	Fire Extinguisher with Hose Cabinet and Base	EA	8	$1,200	$9,600
14	Self Rescue Ladders	EA	8	$600	$4,800
15	Fish Cleaning Tables	LS	All Reqd	$7,500	$7,500
16	Electrical System	LS	All Reqd	$350,000	$350,000
17	Spare Electrical Equipment	LS	All Reqd	$10,000	$10,000
	ESTIMATED CONSTRUCTION BID PRICE				**$3,665,310**
	CONTINGENCY (15%)				**$549,797**
	ENVIRONMENTAL PERMITTING, FINAL DESIGN, CONTRACT ADMINISTRATION, CONSTRUCTION INSPECTION & OTHER INDIRECT COSTS (20%)				**$733,062**
	TOTAL RECOMMENDED PROJECT BUDGET				**$4,948,169**

O'CONNELL BRIDGE LIGHTERING FLOAT

The lightering float beneath the O'Connell Bridge was constructed in 1997 and then replaced in 2002 when the original float was relocated to Crescent Harbor. Two 100-ft long aluminum gangways provide access to the 10-ft x 180-ft concrete lightering float. The primary use of the float is by the cruise ship industry, which use life boats to transport passengers between the float and cruise ship vessels that anchor in Eastern Passage. The site is subjected to wind and wave conditions that are generated by southerly winds propagated from Eastern Passage. The sea conditions can be experienced throughout the year, although occur with greater frequency during the winter months. For this reason, at the end of the tourist season, the float is removed from its summer use location beneath the O'Connell Bridge and is stored behind the breakwater float at Thomsen Harbor during the winter season.

Observations

Concrete Lightering Float:
The float was observed in its winter storage location behind the Thomsen Harbor breakwater float. The overall condition of the float is good. Rust was observed on the galvanized steel rubstrip backing bar but is of little concern to the structural capacity of the float. One of the float connection rubber pads is partially sheared. There is a vertical height difference between float modules across the module connections that presents a trip hazard. The timber bullrail has some signs of wear but overall is in good condition.

Gangways:
The general condition of the gangways is good to new. The shoreward hinge has been modified with a greased fitting after reports of heavy grinding between the shackles and pad eye plate that were initially installed.

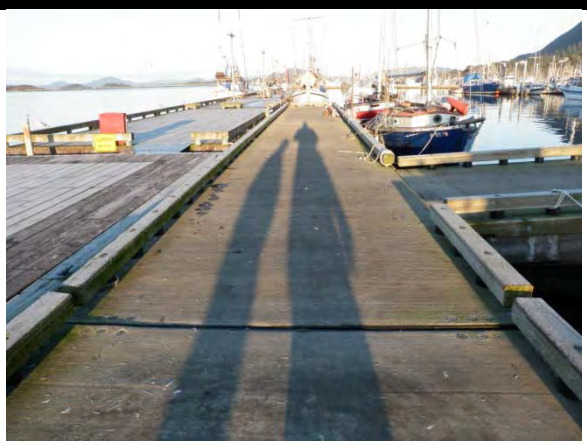
Upland Access and Parking:
The uplands parking lot consists of approximately .25 acres of asphalt paved area. Concrete curb and gutter and sidewalk line the perimeter of the asphalt paving. Overall, the condition of the uplands is good and has approximately 15 years of remaining safe and usable service life.

Conclusions

During the summer months, the float experiences high use and wave action due to the site's open exposure. However, if the float remains a seasonal use facility and continues to be stored in a protected environment during winter months, it will extend the life expectancy of the float. It is estimated that the facility has a remaining safe and usable service life of approximately 20 years.

O' CONNELL BRIDGE LIGHTERING FLOAT PHOTOGRAPH LOG

Gangways



Concrete Lightering Float

Concrete Lightering Float

Pile Hoop

Bullrail & D-Fender

Rusted Backing Bar

TIDAL DATA	
EHW	14.6'
EHT	12.7'
MHHW	9.9'
MHW	9.1'
MLLW	0.0'
ELW	-4.0'

CITY AND BOROUGH OF SITKA
DECEMBER 2, 1971

REVISIONS

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SITKA, ALASKA
SITKA HARBOR SYSTEM
MASTER PLAN

SHEET TITLE.
O'CONNELL BRIDGE LIGHTERING FLOAT

PND PROJECT NO. 112070.01 DWG. FILE.

1
SHEET 1 OF 1

7 O'CONNELL BRIDGE LIGHTERING FLOAT IN KIND REPLACEMENT BUDGETARY ESTIMATE

Prepared By: PND Engineers, Inc., February 2012

Item	Item Description	Units	Quantity	Unit Cost	Amount
7A MARINE FACILITIES					
1	Mobilization	LS	All Reqd	10%	$99,750
2	Demolition & Disposal	LS	All Reqd	$100,000	$100,000
3	Construction Surveying	LS	All Reqd	$20,000	$20,000
4	100' Covered Aluminum Gangway	EA	2	$150,000	$300,000
5	Signage	LS	All Reqd	$2,500	$2,500
6	Gangway Landing Float	EA	2	$40,000	$80,000
7	10' x 180' Concrete Lightering Float	SF	1800	$200	$360,000
8	Steel Pipe Pile, 16" dia. x 0.500" thick	EA	8	$9,000	$72,000
9	Pile Strut	EA	1	$15,000	$15,000
10	Predrilled Pile Sockets (50% Est.)	EA	4	$5,000	$20,000
11	Anodes	EA	16	$1,500	$24,000
12	Life Ring Cabinet and Base	EA	2	$1,000	$2,000
13	Fire Extinguisher Cabinet and Base	EA	2	$1,000	$2,000
	ESTIMATED CONSTRUCTION BID PRICE				**$1,097,250**
	CONTINGENCY (15%)				**$164,588**
	ENVIRONMENTAL PERMITTING, FINAL DESIGN, CONTRACT ADMINISTRATION, CONSTRUCTION INSPECTION & OTHER INDIRECT COSTS (20%)				**$219,450**
	TOTAL RECOMMENDED PROJECT BUDGET				**$1,481,288**
7B UPLAND ACCESS AND PARKING					
1	Mobilization	LS	All Reqd	10%	$25,125
2	Excavation and Demolition & Disposal	CY	500	$15	$7,500
3	Base Course, Grading D-1	CY	350	$50	$17,500
4	Storm Drain System	LS	All Reqd	$30,000	$30,000
5	3" ACP Paving	SY	2000	$55	$110,000
6	Painting & Striping	LS	All Reqd	$7,500	$7,500
7	Concrete Sidewalk	SY	150	$75	$11,250
8	Curb & Gutter	LF	250	$40	$10,000
9	Construction Surveying	LS	All Reqd	$7,500	$7,500
10	Electrical/Lighting System	LS	All Reqd	$50,000	$50,000
	ESTIMATED CONSTRUCTION BID PRICE				**$276,375**
	CONTINGENCY (15%)				**$41,456**
	ENVIRONMENTAL PERMITTING, FINAL DESIGN, CONTRACT ADMINISTRATION, CONSTRUCTION INSPECTION & OTHER INDIRECT COSTS (20%)				**$55,275**
	TOTAL RECOMMENDED PROJECT BUDGET				**$373,106**
7C UPLAND BUILDING FACILITIES - LIGHTERING FLOAT RESTROOM					
1	Mobilization	LS	All Reqd	10%	$13,300
2	Demolition & Disposal	LS	All Reqd	$25,000	$25,000
3	Restroom	LS	All Reqd	$108,000	$108,000
	ESTIMATED CONSTRUCTION BID PRICE				**$146,300**
	CONTINGENCY (15%)				**$21,945**
	ENVIRONMENTAL PERMITTING, FINAL DESIGN, CONTRACT ADMINISTRATION, CONSTRUCTION INSPECTION & OTHER INDIRECT COSTS (20%)				**$29,260**
	TOTAL RECOMMENDED PROJECT BUDGET				**$197,505**

CRESCENT HARBOR LIGHTERING FLOAT

The Crescent Harbor Lightering Float was originally installed beneath the O'Connell Bridge in 1997, and was relocated to its current location in 2002 when the new lightering float at O'Connell Bridge was installed. The lightering float consists of a 10-ft x 180-ft long concrete float which transitions to a 14-ft x 60-ft concrete float that is of earlier construction.

Observations

ADA Stairway and Ramp:
The ADA compliant stairways and concrete ramp that lead to each gangway are in good condition with no noted deficiencies.

Gangway:
The general condition of the gangways is good.

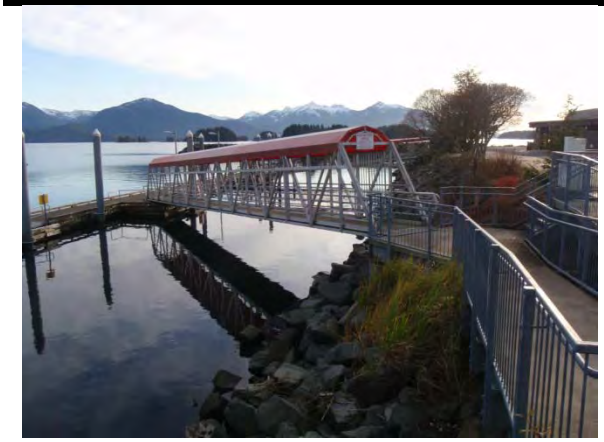
Lightering Float:
The overall condition of the main lightering float is fair to good. The condition of the 14-ft wide float segment is fair.

Piles:
The steel pipe piles are in good condition. Galvanized coatings remain visible.

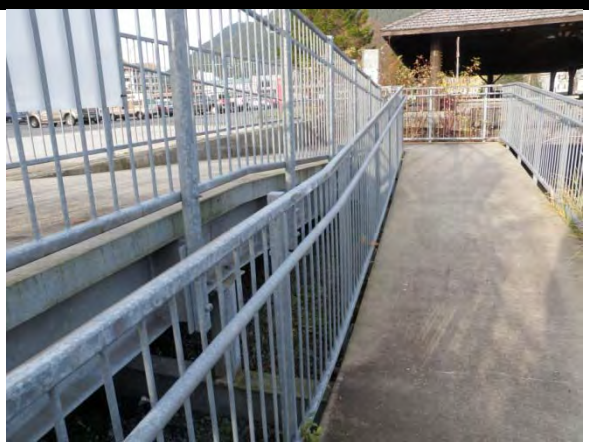
Conclusions

It is estimated that the facility has a remaining safe and usable service life of approximately 15 years.

CRESCENT HARBOR LIGHTERING FLOAT PHOTOGRAPH LOG



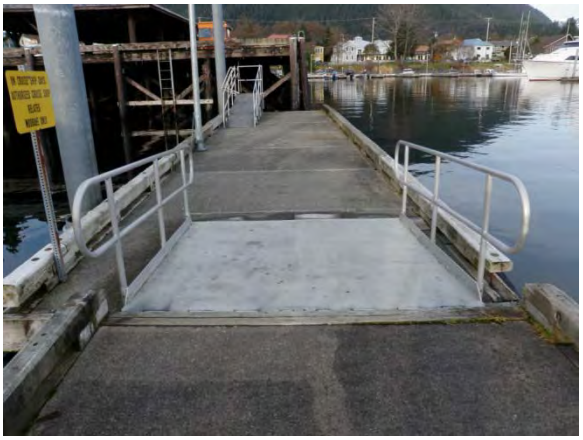
Gangway



ADA ramp

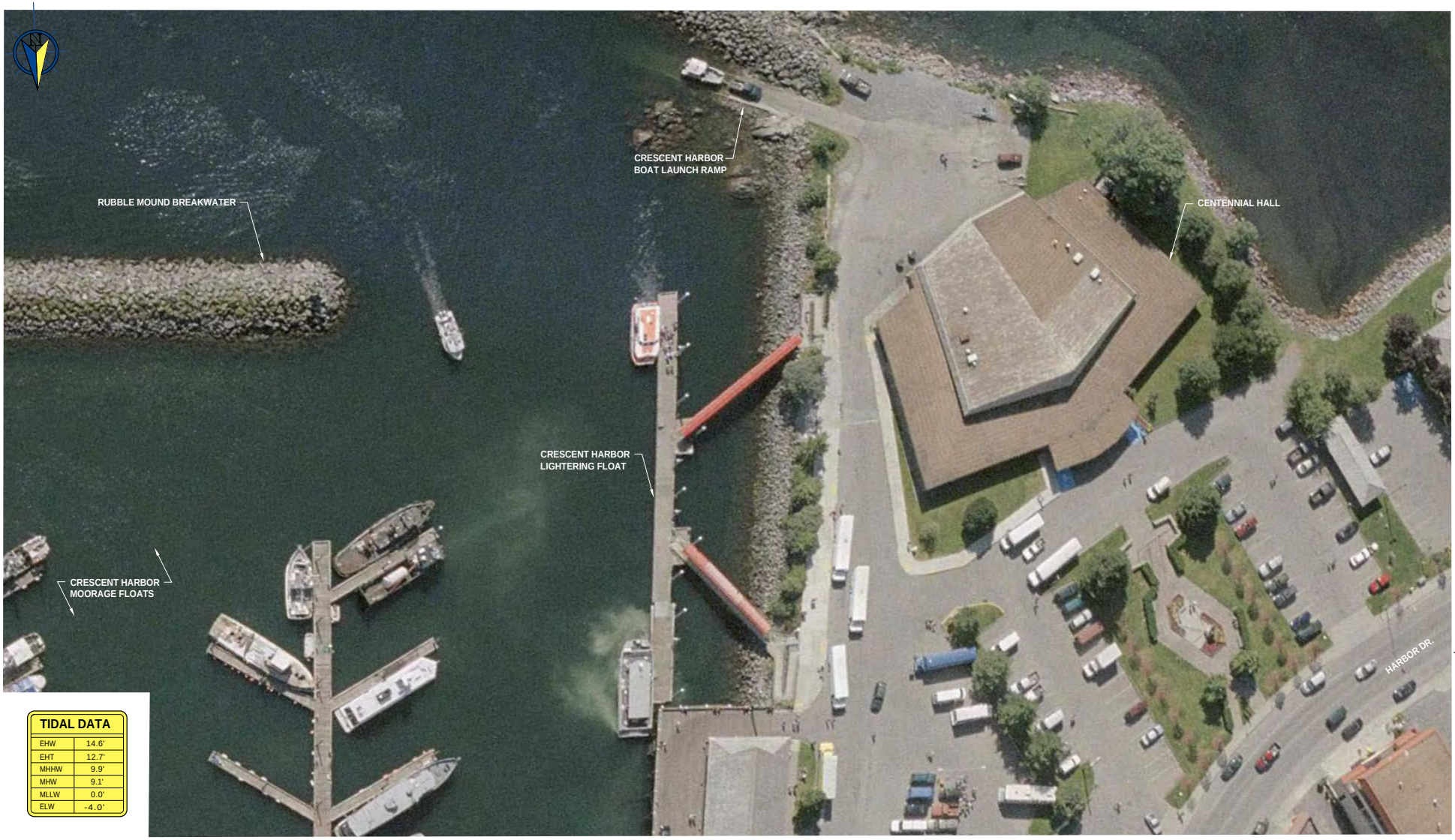
Concrete Lightering Float

Concrete Lightering Float



Transition Ramp

Bullrail & Rubstrip



TIDAL DATA

EHW	14.6'
EHT	12.7'
MHHW	9.9'
MHW	9.1'
MLLW	0.0'
ELW	-4.0'

CITY AND BOROUGH OF SITKA
DECEMBER 2, 1971

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DRAWN: PND APPROVED: CRS
SCALE: SCALE IN FEET 0 30 60 FT.
DATE: FEB. 2012

SITKA, ALASKA
SITKA HARBOR SYSTEM
MASTER PLAN

SHEET TITLE: **CRESCENT HARBOR LIGHTERING FLOAT**

PND PROJECT NO.: 112070.01 DWG. FILE:

SHEET 1 OF 1

8 CRESCENT HARBOR LIGHTERING FLOAT IN KIND REPLACEMENT BUDGETARY ESTIMATE

Prepared By: PND Engineers, Inc., February 2012

Item	Item Description	Units	Quantity	Unit Cost	Amount
1	Mobilization	LS	All Reqd	10%	$140,350
2	Demolition & Disposal	LS	All Reqd	$100,000	$100,000
3	Construction Surveying	LS	All Reqd	$20,000	$20,000
4	ADA Compliant Pathway and Staircase	EA	2	$75,000	$150,000
5	80' Covered Aluminum Gangway	EA	2	$120,000	$240,000
6	16' x 16' Gangway Landing Float	EA	2	$25,000	$50,000
7	12' x 240' Concrete Lightering Float	SF	2880	$200	$576,000
8	Steel Pipe Pile, 16" dia. x 0.500" thick	EA	12	$9,000	$108,000
9	Predrilled Pile Sockets (50% Est.)	EA	6	$5,000	$30,000
10	Anodes	EA	24	$1,500	$36,000
11	Life Ring Cabinet and Base	EA	3	$1,000	$3,000
12	Fire Extinguisher Cabinet and Base	EA	3	$1,000	$3,000
13	Signage	LS	All Reqd	$2,500	$2,500
14	Electrical/Lighting System	LS	All Reqd	$85,000	$85,000
	ESTIMATED CONSTRUCTION BID PRICE				**$1,543,850**
	CONTINGENCY (15%)				**$231,578**
	ENVIRONMENTAL PERMITTING, FINAL DESIGN, CONTRACT ADMINISTRATION, CONSTRUCTION INSPECTION & OTHER INDIRECT COSTS (20%)				**$308,770**
	TOTAL RECOMMENDED PROJECT BUDGET				**$2,084,198**

FISHERMAN'S WORK FLOAT

The Fisherman's Work Float was designed by Construction Engineering Services and Kennedy Engineering in 1987 and was constructed in 1988.

The work float is a 50-ft x 95-ft timber-framed float. The float provides approximately 270 linear feet of side-tie moorage for transient vessels to perform repairs to fishing gear and/or their vessels. According to Harbor staff, vessels of varying sizes and classes, up to 58-ft long seiners, utilize the float. Access to the float is provided by a 10-ft x 112-ft pile supported timber approach dock, which supports a 6-ft wide x 65-ft long steel gangway. The gangway lands on a 10-ft x 20-ft landing float, which is rigidly connected to the main work float. The float system is anchored in place by two, four-pile strutted moment frames. A small asphalt surfaced fill pad exists at the top of the approach dock, which provides parking for a small number of vehicles. The float is equipped with power, lighting, and water utilities.

Observations

In general, the current overall condition of the facility is good and it appears to be performing its intended purposes. None of the observations made present immediate structural concern. However, the float is over twenty years old and is beginning to show signs of age. The following conditions were observed:

Approach Dock:
The overall condition of the approach dock is good. The decking and handrails are weathered but appear to be structurally sound. The below deck structural elements, consisting of stringers, piles, pile caps, and cross bracing appear to be structurally sound.

Gangway:
The condition of the gangway is good. Vessel impact to the east side of the gangway has damaged a section of attachment hardware that supports the electrical conduit. The primary concern regarding the gangway is its length. 65-ft gangways are no longer permitted in new construction due to the steep gradient that is created during low tides. 80-ft long gangways are required to meet current Americans with Disabilities Act (ADA) standards.

Work Float:
Overall the work float is in fair condition. The timber decking was observed in fair to poor condition, and is bouncy as it appears to span too far a distance without support from stringers beneath. Some of the support sills were examined and early onset of rot were found. The float was found to have a freeboard differential of approximately 7-in from the center of the float to the corners. The bullrail timbers and rubstrips surrounding the float are worn and in poor condition.

Piles:
The steel pipe piles appear to be in good condition. The galvanized coatings are visible throughout the upper portion of the tidal range. Barnacles and other marine growth cover the piles in the lower portion of the tidal range.

Upland Access and Parking:
The uplands consists of an asphalt paved access road from Harbor Drive which leads to a 100-ft x 60-ft asphalt surfaced fill pad that exists at the top of the approach dock and provides parking for about 8 vehicles. The asphalt is in good to new condition and has a remaining safe and usable service life of approximately 20 years.

Conclusions

While the general, overall condition of the facility is good, the work float is over 20 years old, and is showing some signs of age. In its current condition, it is estimated that the work float has a remaining safe and useful service life of approximately 10 years. The approach dock, gangway, and piles have a safe and useful service life of approximately 15 years.

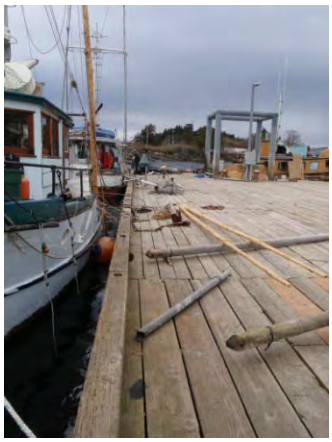
FISHERMAN'S WORK FLOAT PHOTOGRAPH LOG

Approach Dock

Approach Dock

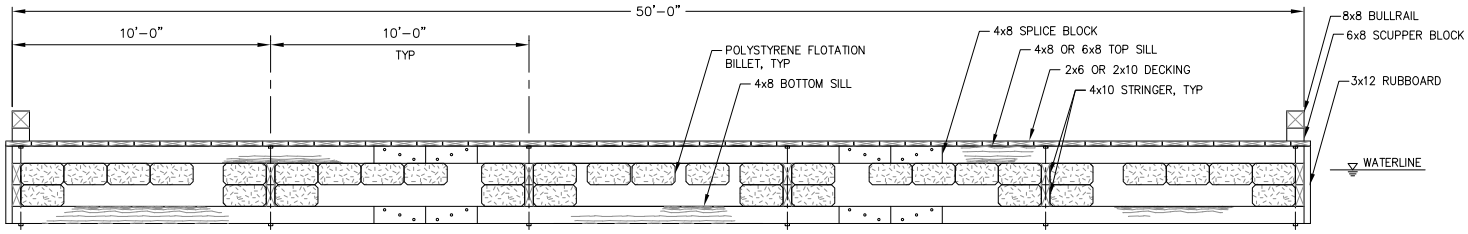
Gangway

Work Float

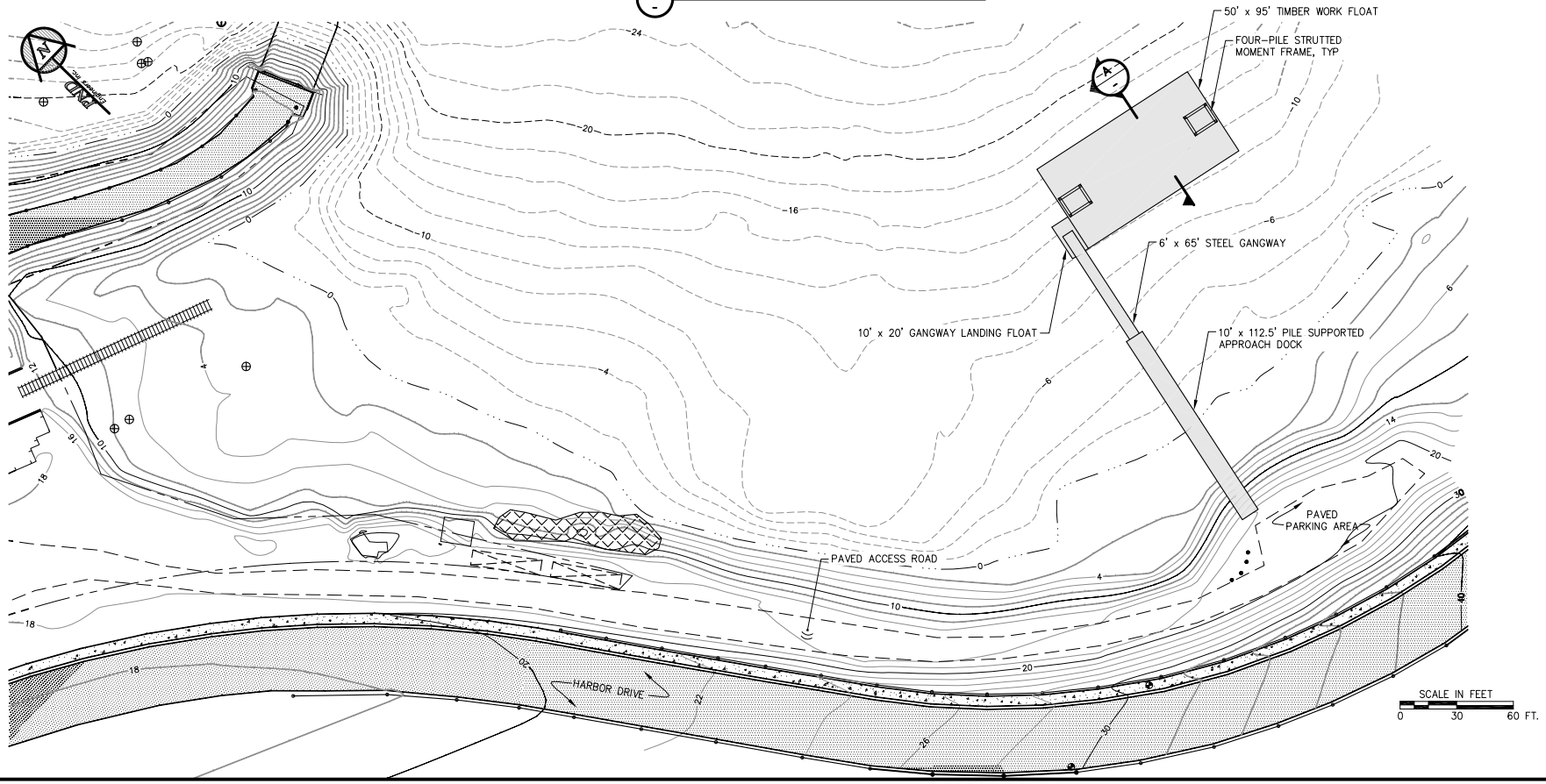


Work Float

Pile Strut



A TYPICAL FLOAT CONSTRUCTION - SECTION



CITY AND BOROUGH OF SITKA
DECEMBER 2, 1971

REVISIONS

REV.	DATE	DESCRIPTION	DWN.	CKD.	APP.

P N D ENGINEERS, INC.
9360 Glacier Highway Ste 100
Juneau, Alaska 99801
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Fax: 907-586-2099
www.pnd-anc.com

DESIGN: BMI CHECKED: JLD
DRAWN: BMI APPROVED: CRS
SCALE: AS SHOWN
DATE: FEB. 2012

SITKA, ALASKA
SITKA HARBOR SYSTEM MASTER PLAN

SHEET TITLE: **FISHERMAN'S WORK FLOAT**

PND PROJECT NO. 112070.01 DWG. FILE:

SHEET 1 OF 1

9 FISHERMAN'S WORK FLOAT
IN KIND REPLACEMENT BUDGETARY ESTIMATE
Prepared By: PND Engineers, Inc., February 2012

Item	Item Description	Units	Quantity	Unit Cost	Amount
9A MARINE FACILITIES					
1	Mobilization	LS	All Reqd	10%	$161,625
2	Construction Surveying	LS	All Reqd	$40,000	$40,000
3	Demolition & Disposal	LS	All Reqd	$100,000	$100,000
4	10' x 110' Approach Dock	SF	1100	$200	$220,000
5	7' x 80' Aluminum Gangway	LS	All Reqd	$120,000	$120,000
6	Gangway Abutment	LS	All Reqd	$25,000	$25,000
7	Work Float, 50' x 95'	SF	4750	$135	$641,250
8	Work Float Mooring Pile	EA	8	$15,000	$120,000
9	Pile Socket	EA	8	$15,000	$120,000
10	Pile Struts	LS	All Reqd	$40,000	$40,000
11	Anodes	LS	All Reqd	$25,000	$25,000
12	Water Service on Work Float	LS	All Reqd	$65,000	$65,000
13	Power and Lighting on Work Float	LS	All Reqd	$100,000	$100,000
	ESTIMATED CONSTRUCTION BID PRICE				**$1,777,875**
	CONTINGENCY (15%)				**$266,681**
	ENVIRONMENTAL PERMITTING, FINAL DESIGN, CONTRACT ADMINISTRATION, CONSTRUCTION INSPECTION & OTHER INDIRECT COSTS (20%)				**$355,575**
	TOTAL RECOMMENDED PROJECT BUDGET				**$2,400,131**
9B UPLAND ACCESS AND PARKING					
1	Mobilization	LS	All Reqd	10%	$14,775
2	Excavation and Demolition & Disposal	LS	All Reqd	$10,000	$10,000
3	Base Course, Grading D-1	CY	125	$50	$6,250
4	Storm Drain System	LS	All Reqd	$20,000	$20,000
5	3" ACP Paving	SY	800	$55	$44,000
6	Painting & Striping	LS	All Reqd	$2,500	$2,500
7	Guardrail	LF	100	$75	$7,500
8	Construction Surveying	LS	All Reqd	$7,500	$7,500
9	Power and Lighting in Uplands	LS	All Reqd	$50,000	$50,000
	ESTIMATED CONSTRUCTION BID PRICE				**$162,525**
	CONTINGENCY (15%)				**$24,379**
	ENVIRONMENTAL PERMITTING, FINAL DESIGN, CONTRACT ADMINISTRATION, CONSTRUCTION INSPECTION & OTHER INDIRECT COSTS (20%)				**$32,505**
	TOTAL RECOMMENDED PROJECT BUDGET				**$219,409**

FISH CLEANING FLOAT

The fish cleaning float is a 25-ft x 25-ft timber framed float with a 10-ft opening in the center. There are three aluminum fish cleaning tables surrounding the opening on the float with spill chutes to deposit carcasses. Non-skid traction decking surrounds the perimeter of the float. The float is anchored in place by 2 separate anchors and chains. The float system parted from its moorings in late December 2011 and drifted into the beach. Harbor staff stated that the billets and rubboard were damaged from impacting the rocky shoreline.

Observations

Timber Float:
The float is aged but there were no signs of rot in the timber of other significant deficiencies.

Water System:
The harbor water system consists of a HDPE pipe and yard hydrants fed from the City's water main.

Conclusions

Once repairs are made and the float is re-anchored, it is estimated that the facility has a remaining safe and usable service life of approximately 10 years.

FISH CLEANING FLOAT PHOTOGRAPH LOG

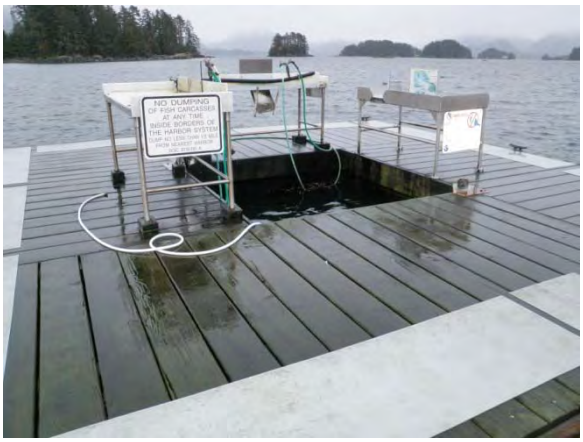
Fish Cleaning Float

Fish cleaning tables and signage

Fish cleaning tables

Spill chutes

Non-skid surfacing



Overall float decking and non-skid surfacing

TIDAL DATA	
EHW	14.6'
EHT	12.7'
MHHW	9.9'
MHW	9.1'
MLLW	0.0'
ELW	-4.0'

CITY AND BOROUGH OF SITKA
DECEMBER 2, 1971

REVISIONS

REV.	DATE	DESCRIPTION	DWN.	CKD.	APP.

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DESIGN: PND CHECKED: CRS
DRAWN: PND APPROVED: CRS
SCALE: SCALE IN FEET 0 40 80 FT.
DATE: FEB. 2012

SITKA, ALASKA
SITKA HARBOR SYSTEM
MASTER PLAN

SHEET TITLE: **FISH CLEANING FLOAT**
PND PROJECT NO.: 112070.01 DWG. FILE:
SHEET 1 OF 1

10 FISH CLEANING FLOAT
IN KIND REPLACEMENT BUDGETARY ESTIMATE
Prepared By: PND Engineers, Inc., February 2012

Item	Item Description	Units	Quantity	Unit Cost	Amount
1	Mobilization	LS	All Reqd	10%	$18,863
2	Demolition & Disposal	LS	All Reqd	$15,000	$15,000
3	Construction Surveying	LS	All Reqd	$7,500	$7,500
4	Signage	LS	All Reqd	$1,000	$1,000
5	25' x 25' Timber Float	SF	525	$125	$65,625
6	Concrete Anchor Blocks and Chain	LS	All Reqd	$50,000	$50,000
7	Fish Cleaning Tables	LS	All Reqd	$7,500	$7,500
8	Life Ring Cabinet and Base	EA	1	$1,000	$1,000
9	Fire Extinguisher Cabinet and Base	EA	1	$1,000	$1,000
10	Domestic Water System	LS	All Reqd	$40,000	$40,000
	ESTIMATED CONSTRUCTION BID PRICE				**$207,488**
	CONTINGENCY (15%)				**$31,123**
	ENVIRONMENTAL PERMITTING, FINAL DESIGN, CONTRACT ADMINISTRATION, CONSTRUCTION INSPECTION & OTHER INDIRECT COSTS (20%)				**$41,498**
	TOTAL RECOMMENDED PROJECT BUDGET				**$280,108**

CRESCENT HARBOR BOAT LAUNCH RAMP

The boat launch ramp at Crescent Harbor was designed by the State of Alaska, Department of Transportation and Public Facilities in 1965 under the original Crescent Harbor design project.

The boat launch ramp is constructed from a combination of cast-in place concrete slabs on grade and precast concrete ramp planks placed on rock fill at a -12.5% grade. The cast-in place slabs are 12-ft wide x 6-in thick and extend from the top of the ramp at +17 ft elevation to approximately +2.5 ft where they transition to concrete ramp planks, which extend until they intersect the harbor basin at -0.5 ft elevation. Approximately 40-ft from the top, the ramp has been widened to 16-ft. The ramp is sheltered by a rubble mound breakwater on the south side of the ramp and an armored slope to the north. The uplands staging, loading and unloading area consists of approximately .13 acres of asphalt paved turnaround at the top of the ramp.

Observations

Concrete Ramp Planks:
Overall, the condition of the ramp is poor. Most of the concrete slabs are cracked and have broken into small sections that have separated from each other both vertically and horizontally. The separation of the slab has resulted in what appears to be an extremely uneven driving surface of the ramp. The harbor staff places concrete patches routinely on the ramp to keep it serviceable.

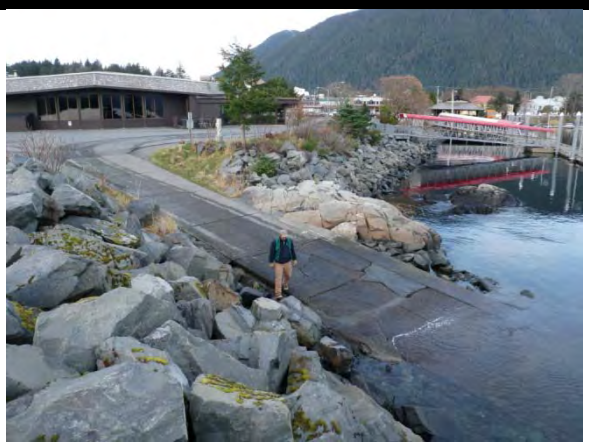
Upland Access and Parking:
The asphalt in the uplands staging area has many potholes and depressed areas that hold water. In its current condition the uplands has a remaining service life of approximately 1-2 years.

Conclusions

Overall, the condition of the launch ramp facility is poor. It is estimated that the facility has a remaining safe and usable service life of approximately 5 years which could be extended to 10 years with continued patching.

CRESCENT HARBOR BOAT LAUNCH RAMP PHOTOGRAPH LOG

Launch Ramp Approach



Concrete Launch Ramp

Concrete Launch Ramp

Concrete Spalls

Rubblemound Breakwater

Damaged Asphalt

TIDAL DATA

EHW	14.6'
EHT	12.7'
MHHW	9.9'
MHW	9.1'
MLLW	0.0'
ELW	-4.0'

CITY AND BOROUGH OF SITKA
DECEMBER 2, 1971

REVISIONS

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DESIGN: PND CHECKED: CRS
DRAWN: PND APPROVED: CRS
SCALE: SCALE IN FEET 0 30 60 FT.

DATE: FEB. 2012

SITKA, ALASKA
SITKA HARBOR SYSTEM
MASTER PLAN

SHEET TITLE:
CRESCENT HARBOR
BOAT LAUNCH RAMP

PND PROJECT NO.: 112070.01 DWG. FILE:

SHEET 1 OF 1

11 CRESCENT HARBOR BOAT LAUNCH RAMP
IN KIND REPLACEMENT BUDGETARY ESTIMATE
Prepared By: PND Engineers, Inc., February 2012

Item	Item Description	Units	Quantity	Unit Cost	Amount
11A MARINE FACILITIES					
1	Mobilization	LS	All Reqd	10%	$22,250
2	Demolition & Disposal	LS	All Reqd	$20,000	$20,000
3	Construction Surveying	LS	All Reqd	$10,000	$10,000
4	Base Course, Grading A	CY	150	$50	$7,500
5	Riprap, Class III	CY	200	$50	$10,000
6	Concrete Apron	LS	All Reqd	$25,000	$25,000
7	Precast Concrete Ramp Planks	LS	All Reqd	$150,000	$150,000
	ESTIMATED CONSTRUCTION BID PRICE				**$244,750**
	CONTINGENCY (15%)				**$36,713**
	ENVIRONMENTAL PERMITTING, FINAL DESIGN, CONTRACT ADMINISTRATION, CONSTRUCTION INSPECTION & OTHER INDIRECT COSTS (20%)				**$48,950**
	TOTAL RECOMMENDED PROJECT BUDGET				**$330,413**
11B UPLAND ACCESS AND PARKING					
1	Mobilization	LS	All Reqd	10%	$7,913
2	Excavation and Demolition & Disposal	CY	150	$15	$2,250
3	Base Course, Grading D-1	CY	100	$50	$5,000
4	Storm Drain System	LS	All Reqd	$20,000	$20,000
5	3" ACP Paving	SY	625	$55	$34,375
6	Painting & Striping	LS	All Reqd	$2,500	$2,500
7	Guardrail	LF	100	$75	$7,500
8	Construction Surveying	LS	All Reqd	$7,500	$7,500
	ESTIMATED CONSTRUCTION BID PRICE				**$87,038**
	CONTINGENCY (15%)				**$13,056**
	ENVIRONMENTAL PERMITTING, FINAL DESIGN, CONTRACT ADMINISTRATION, CONSTRUCTION INSPECTION & OTHER INDIRECT COSTS (20%)				**$17,408**
	TOTAL RECOMMENDED PROJECT BUDGET				**$117,501**

Note: Costs for boarding float and expansion to two-lane facility not included.

SEALING COVE HARBOR BOAT LAUNCH RAMP

The boat launch ramp at Sealing Cove Harbor was designed by the State of Alaska, Department of Transportation and Public Facilities in 1982 under the Sealing Cove Harbor construction.

The boat launch ramp is constructed from precast concrete ramp planks placed on rock fill at a -12% grade. The ramp planks are 16 feet wide and extend from the top of the ramp at +16 ft elevation to where they intersect the harbor basin at -2 ft elevation. The 220-ft long timber boarding float comprised of (11) 20-ft long segmental units. The shoreward (3) modules are 6 foot wide timber framed units anchored in place by piles external to the float. The seaward (8) float modules are of similar construction and condition, but are 8 feet wide and anchored in place by piles internal to the float.

Observations

Concrete Ramp Planks:
The concrete ramp planks are in fair condition. The surface of the individual planks has been worn to exposed aggregate but the overall ramp surface is reasonably consistent and no significant potholes were observed. Users of the ramp have stated that a hole at the toe of the ramp has been created as a result of boats 'power loading' onto trailers. Power loading causes propeller wash to erode away sediment at the bottom of the ramp and creates the potential for trailer tires to get stuck while attempting to launch at low tidal elevations.

Boarding Float:
The structural timbers of the float appear to be in fair condition. The rubboard on the sides of the boarding floats are detached in several areas which creates a docking hazard to boats. Many of the floatation billets have damaged coatings and exposed polystyrene foam. Without coatings the foam becomes saturated and reduces the freeboard capacity of the float. The concrete ramp planks do not extend beneath the boarding floats and the boarding floats rest on a layer of gravel that has eroded to depths of 6" or more below the ramp planks. The uneven ground causes torsion in the boarding floats and hinge assemblies when the float grounds out. Along with the structural damage caused by the twisting and unevenness of the float, a safety concern while walking across the float is also created. There is an approximate 3-in gap between float modules which creates a potential trip hazard.

Piles:
The creosote treated timber piles appear to be structurally sound and in fair condition.

Upland Access and Parking:
The uplands consists of approximately .6 acres of asphalt surfaced area and provides parking for approximately 50 vehicles. The upland parking facilities are generally in fair to good condition with an estimated remaining safe and usable service life of approximately 10 years, provided interim patching and crack sealing is soon accomplished.

Conclusions

Overall the launch ramp is in fair condition but some of the components create potential safety hazards. The gravel beneath the float should be regraded to level out the side to side list across the floats and the hole at the bottom of the ramp should filled in with rock large enough to not be eroded by propeller wash. The facility has an estimated remaining safe and usable service life of approximately 10 years.

SEALING COVE HARBOR BOAT LAUNCH RAMP PHOTOGRAPH LOG

Boat Launch Ramp

Timber Boarding Float

Damaged Floatation Billets

Ramp Planks & Boarding Float

Hinge Connection Hardware

Asphalt Parking Area

CITY AND BOROUGH OF SITKA
DECEMBER 2, 1971

REVISIONS

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DESIGN: PND CHECKED: CRS
DRAWN: PND APPROVED: CRS
SCALE: SCALE IN FEET 0 40 80 FT.
DATE: FEB. 2012

SITKA, ALASKA
SITKA HARBOR SYSTEM
MASTER PLAN

SHEET TITLE:
SEALING COVE HARBOR
BOAT LAUNCH RAMP

PND PROJECT NO.: 112070.01 DWG. FILE:

SHEET 1 OF 1

12 SEALING COVE HARBOR BOAT LAUNCH RAMP IN KIND REPLACEMENT BUDGETARY ESTIMATE

Prepared By: PND Engineers, Inc., February 2012

Item	Item Description	Units	Quantity	Unit Cost	Amount
12A	**MARINE FACILITIES**				
1	Mobilization	LS	All Reqd	10%	$65,000
2	Demolition & Disposal	LS	All Reqd	$30,000	$30,000
3	Construction Surveying	LS	All Reqd	$15,000	$15,000
4	Base Course, Grading A	CY	150	$50	$7,500
5	Riprap, Class II	CY	300	$50	$15,000
6	Concrete Apron and Abutment	LS	All Reqd	$40,000	$40,000
7	Precast Concrete Ramp Planks	LS	All Reqd	$240,000	$240,000
8	Timber Boarding Float	LS	All Reqd	$250,000	$250,000
9	Steel Pipe Pile, 12.75" dia. x 0.500" thick	EA	5	$7,500	$37,500
10	Predrilled Pile Sockets (assume 60%)	EA	3	$5,000	$15,000
	ESTIMATED CONSTRUCTION BID PRICE				**$715,000**
	CONTINGENCY (15%)				**$107,250**
	ENVIRONMENTAL PERMITTING, FINAL DESIGN, CONTRACT ADMINISTRATION, CONSTRUCTION INSPECTION & OTHER INDIRECT COSTS (20%)				**$143,000**
	TOTAL RECOMMENDED PROJECT BUDGET				**$965,250**
12B	**UPLAND ACCESS AND PARKING**				
1	Mobilization	LS	All Reqd	10%	$18,200
2	Excavation and Demolition & Disposal	LS	All Reqd	$12,000	$12,000
3	Base Course, Grading D-1	CY	500	$50	$25,000
4	Storm Drain System	LS	All Reqd	$50,000	$50,000
5	3" ACP Paving	SY	1000	$55	$55,000
6	Painting & Striping	LS	All Reqd	$7,500	$7,500
7	Construction Surveying	LS	All Reqd	$7,500	$7,500
8	Electrical/Lighting System	LS	All Reqd	$25,000	$25,000
	ESTIMATED CONSTRUCTION BID PRICE				**$200,200**
	CONTINGENCY (15%)				**$30,030**
	ENVIRONMENTAL PERMITTING, FINAL DESIGN, CONTRACT ADMINISTRATION, CONSTRUCTION INSPECTION & OTHER INDIRECT COSTS (20%)				**$40,040**
	TOTAL RECOMMENDED PROJECT BUDGET				**$270,270**

Note: Costs for expansion to two-lane facility are not included in this estimate.

CRESCENT HARBOR HIGH LOAD DOCK & NET SHED

The High Load Dock and Net Shed at Crescent Harbor was originally designed by the State of Alaska, Department of Transportation & Public Facilities in 1965.

The initial construction occurred around 1965 and consisted of a 28-ft wide x 156-ft long pile supported structure with 20-ft wide approach dock sections on each end that returned to timber bulkheads at the shore. The inside was open to rock fill from the shoreline slope.

A second construction improvement occurred in 1985. This construction work consisted of filling in the open area between the two 20-ft wide approach dock sections, using members similar to that of the original construction. Construction of the dock mounted covered net shed also occurred at this time.

The dock framing consists of creosote-treated timber piles spaced on a grid of 13ft-6in x 12ft-6in and are laterally supported by connection of 3x8 timber cross bracing. The piles support creosote treated 12x12 pile caps which in turn support 4x14 stringers. The decking is constructed from 3x12 timbers. 12x12 timber bullrails line the perimeter of the decking. Battered timber fender piles, at each pile bent, line the exterior face of the dock.

Observations

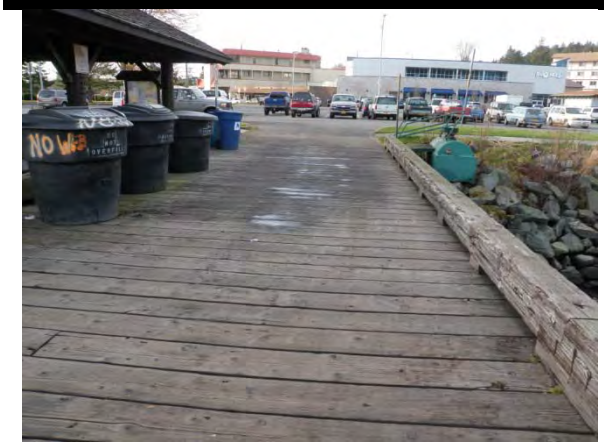
Dock:
Overall the condition of the dock is fair to good. The decking and bullrails are weathered and show signs of wear, but appear to be structurally sound in most areas. Beneath the deck the timber piles, stringers, and cross bracing appear to be in fair to good condition. Creosote treatment is visible throughout and the timbers near shore sound hard when struck with a hammer. The outside perimeter of the structure, which is from the 1965 construction, was not observed and dive assistance would be needed to further assess the condition of the timbers below the tidal elevation. Although at nearly 50 years old the typical life expectancy of these piles has been exceeded.

Net Shed:
The 16-in diameter piles on the south corners of the shelter are chipped at deck level, possibly from snow removal equipment. Harbor staff recently placed plexi-glass over the South truss to protect it from rain exposure that was apparently causing rot in the roof trusses and also replaced the timber truss. Two timber piles in the center of the net shed were recently replaced. The CBS Building Department recently (January 2012) reported significant deterioration and rot in the shingle roof system. The Building Department provided a rough estimate of costs to replace the roof within the next two years.

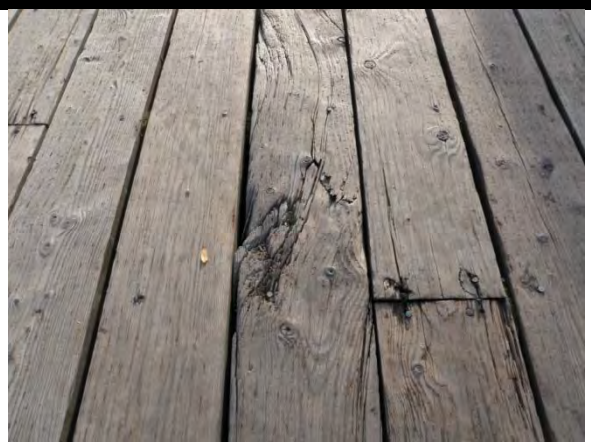
Conclusions

A more thorough inspection should be performed on the portion of the facility remaining from the 1965 construction. If the timbers in this area remain structurally sound then it is likely that the facility has an estimated remaining service life of approximately 25 years.

CRESCENT HARBOR HIGH LOAD DOCK & NET SHED PHOTOGRAPH LOG



Pile supported high load dock



Timber deck board wear, deep rutting

Timber piles, stringers and cross bracing

Damaged safety ladder

Exterior net shed

Net shed exterior and roof line

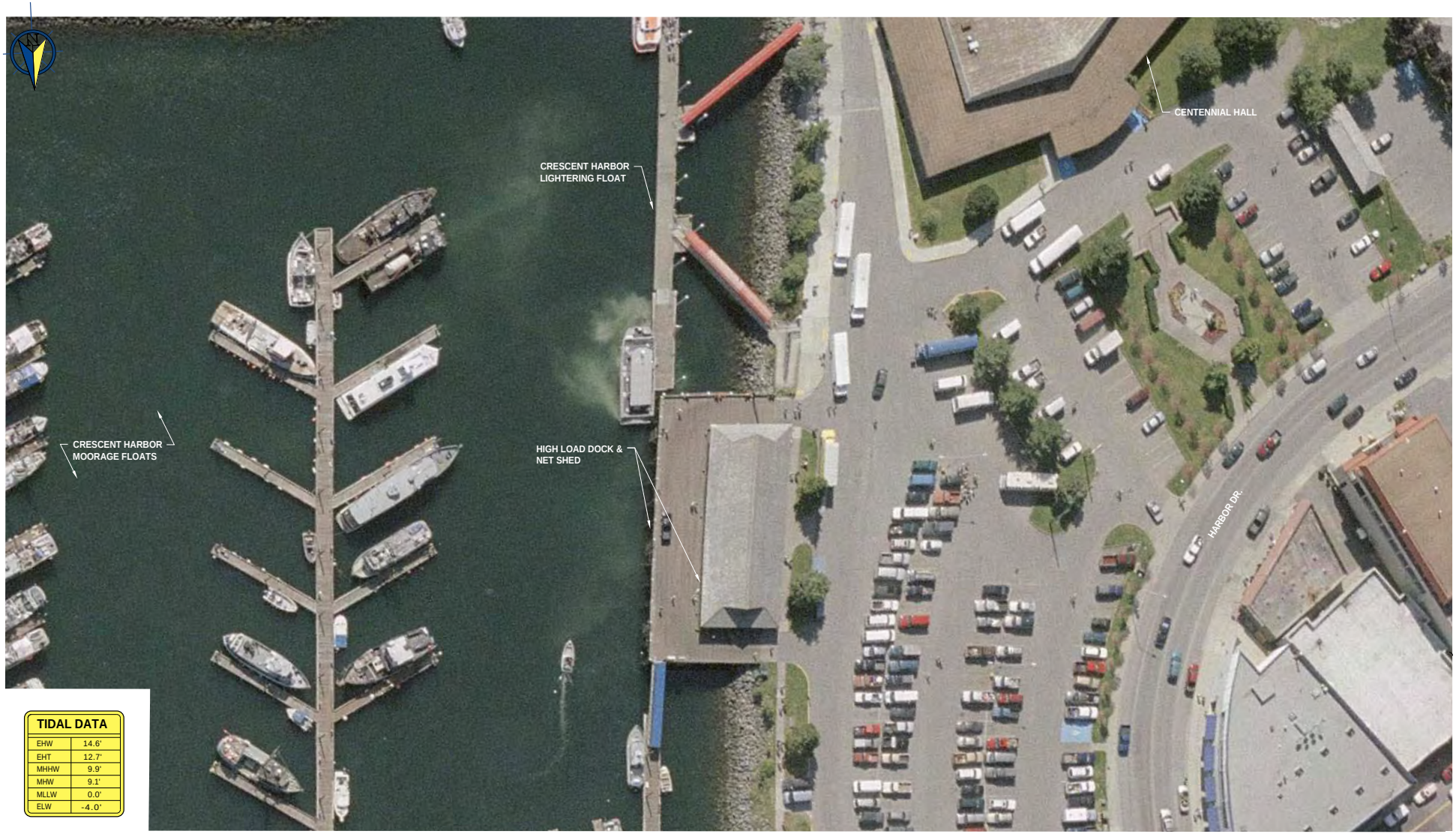
16” diameter exterior piles

Interior roof

Damaged timber decking

Pile penetration at deck

Damaged timber deck and bullrail



TIDAL DATA	
EHW	14.6'
EHT	12.7'
MHHW	9.9'
MHW	9.1'
MLLW	0.0'
ELW	-4.0'

CITY AND BOROUGH OF SITKA
DECEMBER 2, 1971

REVISIONS

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DESIGN: PND CHECKED: CRS
DRAWN: PND APPROVED: CRS
SCALE: SCALE IN FEET 0 30 60 FT.
DATE: FEB. 2012

SITKA, ALASKA
SITKA HARBOR SYSTEM
MASTER PLAN

SHEET TITLE:
CRESCENT HARBOR
HIGH LOAD DOCK & NET SHED

PND PROJECT NO.: 112070.01 DWG. FILE:

SHEET 1 OF 1

13 CRESCENT HARBOR HIGH LOAD DOCK & NET SHED IN KIND REPLACEMENT BUDGETARY ESTIMATE

Prepared By: PND Engineers, Inc., February 2012

Item	Item Description	Units	Quantity	Unit Cost	Amount
13A NET SHED ROOF REPAIRS					
1	Net Shed Roof Repairs	LS	All Reqd	$103,043	$103,043
	ESTIMATED CONSTRUCTION BID PRICE				**$103,043**
	CONTINGENCY (15%)				**$15,456**
	ENVIRONMENTAL PERMITTING, FINAL DESIGN, CONTRACT ADMINISTRATION, CONSTRUCTION INSPECTION & OTHER INDIRECT COSTS (20%)				**$20,609**
	TOTAL RECOMMENDED PROJECT BUDGET				**$139,108**
13B HIGH LOAD DOCK & NET SHED REPLACEMENT					
1	Mobilization	LS	All Reqd	10%	$335,383
2	Demolition & Disposal	LS	All Reqd	$300,000	$300,000
3	Construction Surveying	LS	All Reqd	$40,000	$40,000
4	100' x 150' Pile Supported Dock	SF	15000	$175	$2,625,000
5	50' x 120' Covered Shelter	SF	6000	$75	$338,832
6	Electrical/Lighting System	LS	All Reqd	$50,000	$50,000
	ESTIMATED CONSTRUCTION BID PRICE				**$3,689,215**
	CONTINGENCY (15%)				**$553,382**
	ENVIRONMENTAL PERMITTING, FINAL DESIGN, CONTRACT ADMINISTRATION, CONSTRUCTION INSPECTION & OTHER INDIRECT COSTS (20%)				**$737,843**
	TOTAL RECOMMENDED PROJECT BUDGET				**$4,980,441**

BOAT GRID

The Sitka Boat Grid was originally designed by the State of Alaska, Department of Transportation & Public Facilities in 1963. An addition and repair phase was designed by PND Engineers, Inc. in 1989.

The facility consists of two pile supported docks with a total of four boat grids, one immediately adjacent to either side of each dock. A 6-ft wide x 130 linear foot timber trestle remains from the original construction phase. The decking and handrails were replaced in the 1989 construction phase. The 1989 construction improvements consisted of a 2,000 square foot fill pad and parking area, re-decking the remaining portion of the 6-ft wide trestle, and construction of a 12-ft wide dock with boat grids on either side. There is a timber stairway which gives access to the beach from the uplands. The facility is equipped with lighting and water utilities.

Observations

Timber Approach Dock:
The 6-ft wide dock section is partially from the original construction. The decking and handrails were replaced with construction of the new dock and are in fair to good condition. Although the unprotected tops are growing vegetation and undoubtedly have rot in the upper portions, the lower portions of the piles that bear the weight of the structure appear to be in fair condition with structural capacity remaining. Some of the cross bracing are rotten. The newer section of pile supported dock is in good condition.

Concrete Sleepers:
The concrete sleepers that support the grid timbers adjacent to the 6-ft wide dock are significantly corroded and have lost mass.

Steel Piles and Pile Caps:
The steel pipe piles and pile caps appear to be in good condition. The galvanized coating is remaining.

Boat Grid Timber Sleepers:
Although worn, the 12x12 timbers appear sound and generally in good condition. The timbers had recently been rotated by harbor staff so that no one side of the timber gets exceptionally worn. It appears that this effort will extend the life of the timbers.

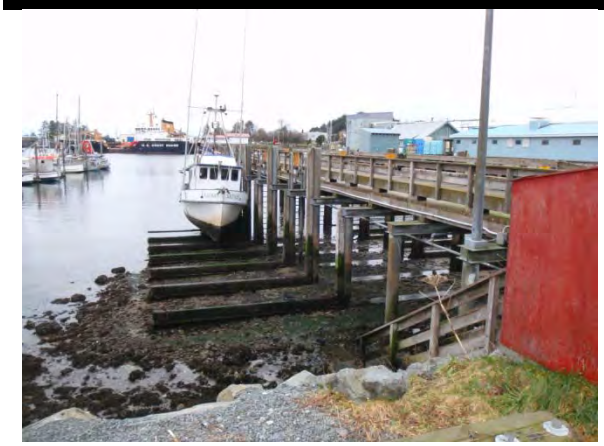
Beach Access Stairway:
The lower portion of the stairway shows some signs of deterioration and rot due to submersion during high tides. The bottom one-foot of the stair chords and handrail timbers show advanced stages of rot. The concrete landing at the bottom of the stairway is corroded evidenced by pitting and loss of concrete mass.

Upland Access and Parking:
The uplands parking area is an approximately 30-ft x 50-ft gravel area adjacent to Katlian St. There is insufficient drainage which has created several potholes that pond water after rain events.

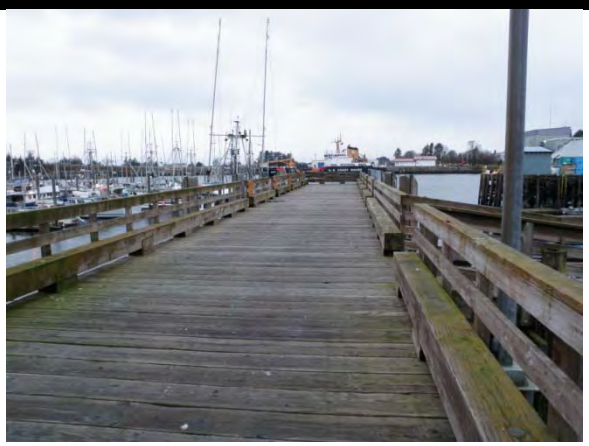
Conclusions

The overall condition of the facility is good. At nearly 50 years old the typical life expectancy of creosote treated timber piles in a marine environment is exceeded, however these piles do appear to have structural capacity remaining and no signs of significant rot were observed. Rot was identified on some of the cross bracing. It is estimated that the facility has a remaining safe and usable service life of approximately 20 years.

BOAT GRID PHOTOGRAPH LOG



Boat Grid



16-ft Dock

6-ft Wide Dock

Timber Piles & Cross Bracing

Steel Pile Caps & Timber Stringers

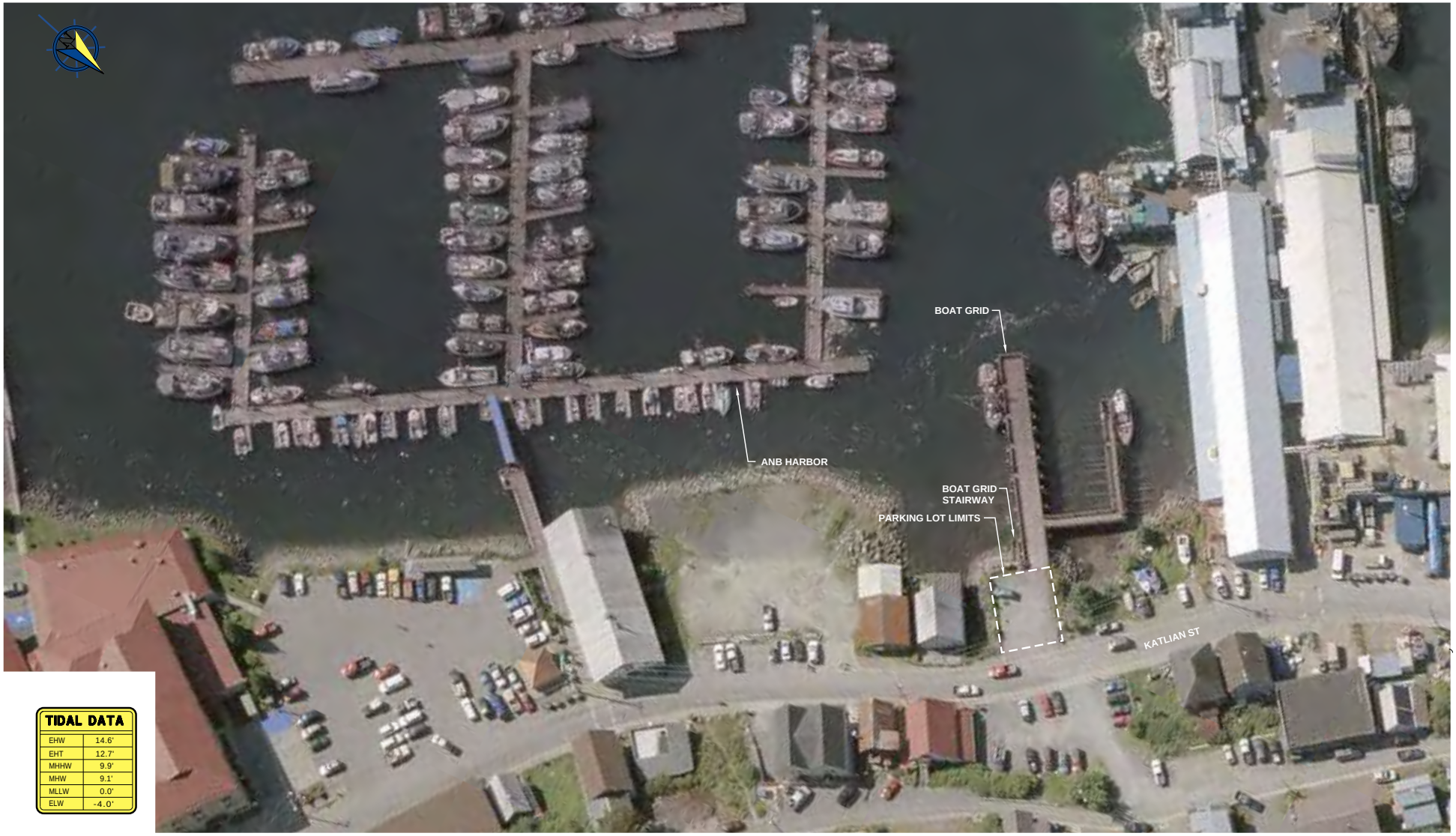
Stairway

Grid Timbers

Rotted Pile Top

Access Ladder

Upland Parking Area



TIDAL DATA

EHW	14.6'
EHT	12.7'
MHHW	9.9'
MHW	9.1'
MLLW	0.0'
ELW	-4.0'

CITY AND BOROUGH OF SITKA — DECEMBER 2, 1971

REVISIONS

REV.	DATE	DESCRIPTION	DWN.	CKD.	APP.

PND ENGINEERS, INC.
9360 Glacier Highway Ste 100
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DESIGN: PND CHECKED: CRS
DRAWN: PND APPROVED: CRS
SCALE: SCALE IN FEET 0 30 60 FT.
DATE: FEB. 2012

SITKA, ALASKA
SITKA HARBOR SYSTEM MASTER PLAN

SHEET TITLE: **BOAT GRID**
PND PROJECT NO.: 112070.01 DWG. FILE:
SHEET 1 OF 1

14 BOAT GRID
IN KIND REPLACEMENT BUDGETARY ESTIMATE
Prepared By: PND Engineers, Inc., February 2012

Item	Item Description	Units	Quantity	Unit Cost	Amount
1	Mobilization	LS	All Reqd	10%	$213,200
2	Demolition & Disposal	LS	All Reqd	$200,000	$200,000
3	Construction Surveying	LS	All Reqd	$25,000	$25,000
4	Pile Supported Dock	SF	3240	$175	$567,000
5	Boat Grids	SF	6800	$175	$1,190,000
6	Electrical/Lighting System	LS	All Reqd	$150,000	$150,000
	ESTIMATED CONSTRUCTION BID PRICE				**$2,345,200**
	CONTINGENCY (15%)				**$351,780**
	ENVIRONMENTAL PERMITTING, FINAL DESIGN, CONTRACT ADMINISTRATION, CONSTRUCTION INSPECTION & OTHER INDIRECT COSTS (20%)				**$469,040**
	TOTAL RECOMMENDED PROJECT BUDGET				**$3,166,020**

MARINE SERVICE CENTER

The Marine Services Center sheet pile bulkhead dock was originally constructed in 1976. The tie-back wall structure is approximately 36-ft high (from mudline) by 356-ft long along the face, with approximately 10-ft long end/return walls at each end of the bulkhead. The PZ27 sheet piles are driven approximately 10-ft to underlying bedrock, and are laterally restrained by exterior, MC8x22.8 walers located at elevations 0.0 ft (MLLW) and -10.0 ft. Each waler is connected via tie-rods to a sheet pile anchor wall approximately 70-ft behind the bulkhead face. The steel, round bar tie-rods are 2 ½-inch diameter, with ends upset to 3 ¼-inch diameter. They are spaced at 6-ft on-center, with the upper tie-rods being offset from the lower tie-rods by 3-ft. The walers and tie-rods are of ASTM A36 chemistry while the sheet piles are of ASTM A690 material. Creosote-treated timber fender piles protect the face of the bulkhead and a 12x12 timber bullrail caps the top of the wall. Steel pipe bollards and access ladders are positioned at varied spacing along the dock face.

Observations

In general, the current overall condition of the sheet pile bulkhead dock is fair to poor. No observations were made that presented any immediate structural concerns. However, the facility is approximately 35 years old and very near the end of its useful design life. Time and the elements have taken their toll, and the current condition of key structural components represents the chief concern with regard to the overall integrity of the bulkhead. The following conditions were observed:

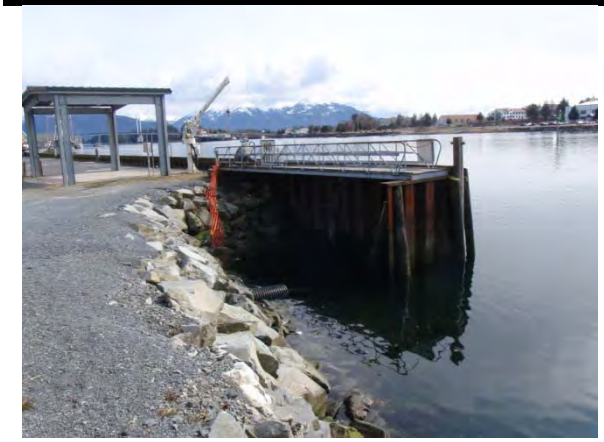
Fender System and Miscellaneous:
With a few exceptions, the overall condition of the timber fender system is good. A 1999 TNH Report identified several rotten fender piles and many instances of broken or otherwise damaged chocking between the fender piles. Since that time, the majority of the fender system appears to have been repaired and/or replaced. Most of the fender piles are very dark in color indicating a high amount of creosote treatment still exists, and several of the fender piles have had galvanized sheet metal caps installed to protect the pile tops from deterioration. The overall condition of the timber bullrail is good with only minor abrasions and normal wear and tear observed. The steel pipe bollards are in good condition and structurally sound. Two of the six access ladders (near SPC Dock) are damaged significantly with the handrails having been bent over as the result of vessel impact.

Sheet Pile Bulkhead:
The overall condition of the steel sheet piles is fair to poor, with particularly significant deterioration in the splash zone. The overall condition of the walers and tie-rods is generally poor. Potential readings obtained indicate the cathodic protection system installed in 2004 is working to protect the bulkhead; however, the readings are at or near the minimum required to be effective and likely not high enough to successfully prevent the observed crevice corrosion.

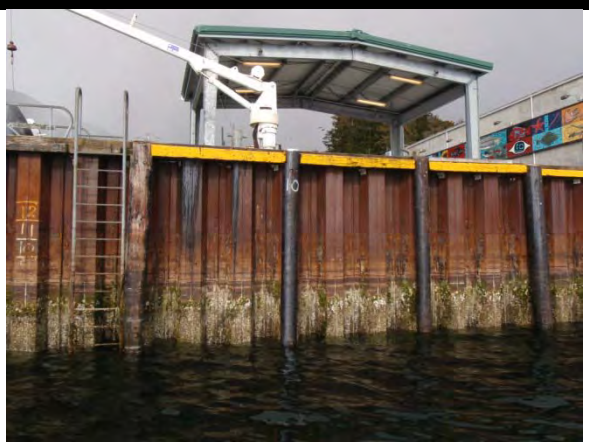
Conclusions

The Marine Services Center is approximately 35 years old and is quickly approaching the end of its useful design life. Conservatively, it is estimated that the existing structure has a remaining life of 5 years.

MARINE SERVICE CENTER PHOTOGRAPH LOG



Backside of Sheetpile Bulkhead



Sheetpile Bulkhead Face

Typical Tie-Rod

Sheetpile Bulkhead Face

Backside of Sheetpile Bulkhead

Dock Face/Damaged Access Ladder

TIDAL DATA

EHW	14.6'
EHT	12.7'
MHHW	9.9'
MHW	9.1'
MLLW	0.0'
ELW	-4.0'

CITY AND BOROUGH OF SITKA
DECEMBER 2, 1971

REVISIONS

REV.	DATE	DESCRIPTION	DWN.	CKD.	APP.

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DESIGN: PND CHECKED: CRS
DRAWN: PND APPROVED: CRS
SCALE: SCALE IN FEET 0 20 40 FT.
DATE: FEB. 2012

SITKA, ALASKA
SITKA HARBOR SYSTEM
MASTER PLAN

SHEET TITLE: **MARINE SERVICE CENTER**
PNAD PROJECT NO.: 112070.01 DWG. FILE:
SHEET 1 OF 1

15 MARINE SERVICE CENTER BULKHEAD
IN KIND REPLACEMENT BUDGETARY COST ESTIMATE
Prepared By: PND Engineers, Inc., September 19, 2011

Item	Item Description	Units	Quantity	Unit Cost	Amount
1	Mobilization	LS	All Reqd	$394,800	$394,800
2	Demolition and Disposal	LS	All Reqd	$200,000	$200,000
3	Sheet Pile Face Wall	LF	360	$3,000	$1,080,000
4	Sheet Pile End Walls	LF	40	$3,200	$128,000
5	New Drilled, Grouted Tie-Rod Anchors	EA	45	$30,000	$1,350,000
6	New Waler Assembly	LF	400	$500	$200,000
7	Shot Rock Fill	CY	5,000	$50	$250,000
8	New C.I.P. Concrete Bulkhead Cap	LF	400	$600	$240,000
9	New CP System (Anodes)	LS	All Reqd	$100,000	$100,000
10	New Timber Fender System	LS	All Reqd	$400,000	$400,000
	ESTIMATED CONSTRUCTION BID PRICE				**$4,342,800**
	CONTINGENCY (15%)				**$651,420**
	ENVIRONMENTAL PERMITTING, FINAL DESIGN, CONTRACT ADMINISTRATION, CONSTRUCTION INSPECTION & OTHER INDIRECT COSTS (20%)				**$868,560**
	TOTAL RECOMMENDED PROJECT BUDGET				**$5,862,780**

SEAPLANE FLOAT

The seaplane float was originally designed by the State of Alaska, Department of Transportation in 1962.

Access to the seaplane float is provided by a 6-ft x 150-ft long timber approach trestle that intersects with Katlian Street. The approach trestle supports a 6-ft x 50-ft long steel gangway that lands on a 10-ft wide x 110-ft long main float. The main float provides transient moorage for approximately three seaplanes. Perpendicular to the main float is a 10-ft wide x 200-ft long float that provides moorage landings for up to eight seaplanes.

Observations

Approach Dock:
The timber approach dock is weathered and at 50 years old and has exceeded its life expectancy.

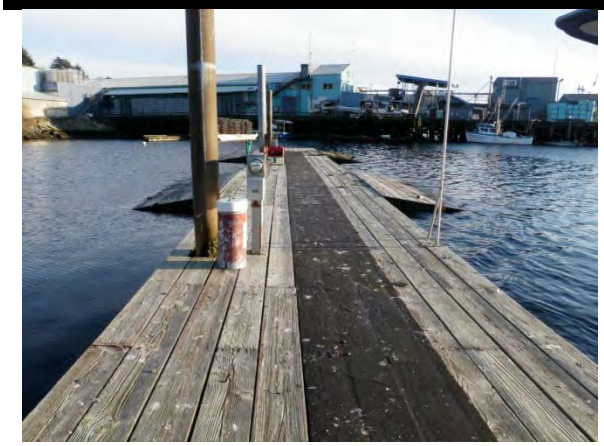
Gangway:
The gangway is of lightweight construction and its length is short, however its components are in fair condition. The primary concern regarding the gangway is its length. 50-ft gangways are no longer permitted in new construction due to the steep gradient that is created during low tides. 80-ft minimum length gangways are required to meet current American Disabilities Act (ADA) standards.

Floats:
In general the timber floats are weathered and shows signs of age. There is no remaining preservative treatment visible on the timbers. The float freeboard is approximately 8-in. The galvanized coatings of the steel pipe piles above the tidal level are beginning to disappear and surface rust on the piles was observed.

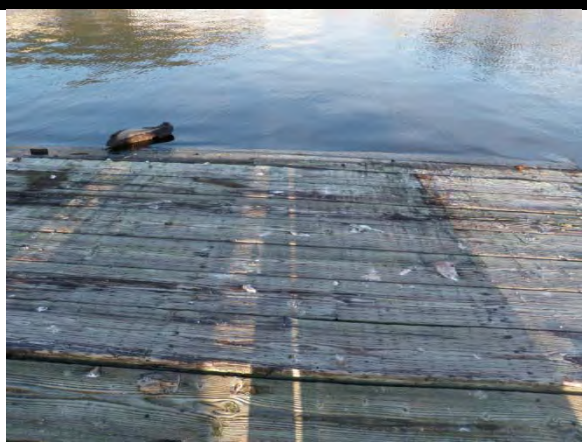
Conclusions

In general, the current overall condition of the seaplane float is fair to poor. The facility shows signs of age and is nearing the end of its useful design life. The seaplane float has an estimated remaining safe and usable service life of approximately 5 years.

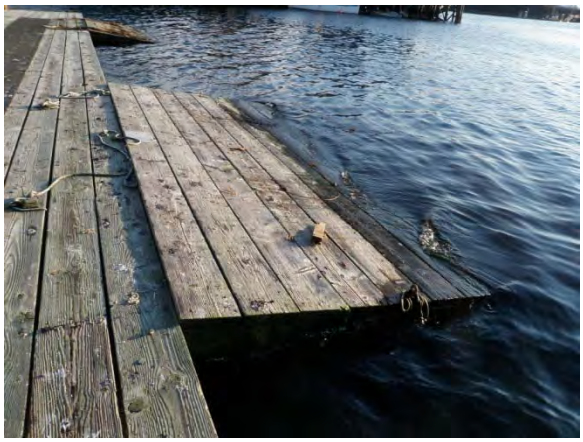
SEAPLANE FLOAT PHOTOGRAPH LOG



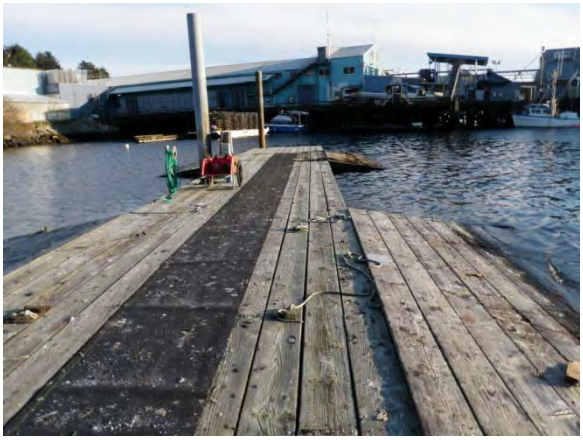
Seaplane Float



Landing



Landing



Seaplane Float

TIDAL DATA	
EHW	14.6'
EHT	12.7'
MHHW	9.9'
MHW	9.1'
MLLW	0.0'
ELW	-4.0'

REVISIONS

REV.	DATE	DESCRIPTION	DWN.	CKD.	APP.

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Fax: 907-586-2099
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DESIGN: PND CHECKED: CRS
DRAWN: PND APPROVED: CRS
SCALE: SCALE IN FEET 0 40 80 FT.
DATE: FEB. 2012

SITKA, ALASKA
SITKA HARBOR SYSTEM
MASTER PLAN

SHEET TITLE: **SEAPLANE FLOAT**

PND PROJECT NO.: 112070.01 DWG. FILE:

SHEET 1 OF 1

16 SEAPLANE FLOAT
IN KIND REPLACEMENT BUDGETARY ESTIMATE
Prepared By: PND Engineers, Inc., February 2012

Item	Item Description	Units	Quantity	Unit Cost	Amount
1	Seaplane Facility	LS	All Reqd	$11,200,000	$11,200,000

Cost estimate provided by DOWL, HKM for proposed Seaplane Replacement Facility.

SECTION 3—UPLAND BUILDING FACILITIES CONDITION INVENTORY

Sitka Harbor System Master Plan

Upland Building Facilities Condition Inventory

February 2012

Executive Summary

General Description

Sitka Harbors operates and maintains seven upland buildings including, five restrooms, one harbormaster/shop building, and one net shed. The restroom buildings are located at the O'Connell Bridge Lightering Float, Sealing Cove Harbor, ANB Harbor, Thomsen Harbor, and Eliason Harbor. The restrooms at Crescent Harbor are operated and maintained by the CBS Parks and Recreation Department and not included in this study. The net shed is located at the west end of Crescent Harbor.

General Condition

All buildings are wood frame construction with concrete footings and range in age from 10 to 35 years old. These are high use facilities on Sitka's waterfront. The typical life expectancy for similar use and construction type public restrooms in a waterfront environment is 30 to 40 years. Overall, facilities in Sitka have been very well maintained and are in good condition despite being at or near their typical life expectancy. Immediate and short term actions were identified for each facility. Immediate actions are upgrades and repairs that address a condition related to health and safety or a condition contributing to system failure. Short-term upgrades and repairs include preventative maintenance.

Estimated Required Expenditures

Cost estimates have been prepared for in kind replacement of the existing facilities. A square footage construction cost is applied to each facility. All facilities remained the same size; with the exception of Eliason restroom which was increased by approximately 10% because it was identified as undersized. Indirect costs are not included in these estimates.

Table 1. Estimated Expenditures Summary

Location/Facility	Replace-in-Kind Cost
Sealing Cove Restroom	$ 158,760
Lightering Float Restrooms	$ 108,000
ANB Restrooms	$ 129,960
Harbor Office Building	$ 220,320
Thomsen Harbor Restroom	$ 118,800
Eliason Restrooms	$ 180,000
Net Shed	$ 338,832
TOTALS	**$ 1,254,672**

Purpose and Scope

This report presents the work done by PND Engineers' team of engineers and architects for the Sitka Harbor System Condition Inventory. The facility condition assessment was conducted November 9-10, 2011 to catalogue conditions and identify corrective measures. A total of seven upland facilities were assessed and are included in this report. The table below depicts the existing facility data for the facilities included.

Table 2. Facility Summary

	Facility Name	Location	Yr. Built	Area (SF)	General Condition	Estimated Remaining Service Life (years)
#1	Restroom	Sealing Cove	1988	441[1]	Good	26
#2	Restroom	O'Connell Bridge Lightering Float	Recent	300	Good	50
#3	Restroom	ANB Harbor	1986	361	Fair	24
#4	Harbormaster Bldg	Thomsen Harbor	1994	1,350	Good	32
#5	Restroom	Thomsen Harbor	1976	330	Good	14
#6	Restroom	Eliason Harbor	1986	458[1]	Good/Undersized	24
#7	Net Shed	Crescent Harbor	1985	5,200	Good	23

[1] Approximate area, no drawings were available.

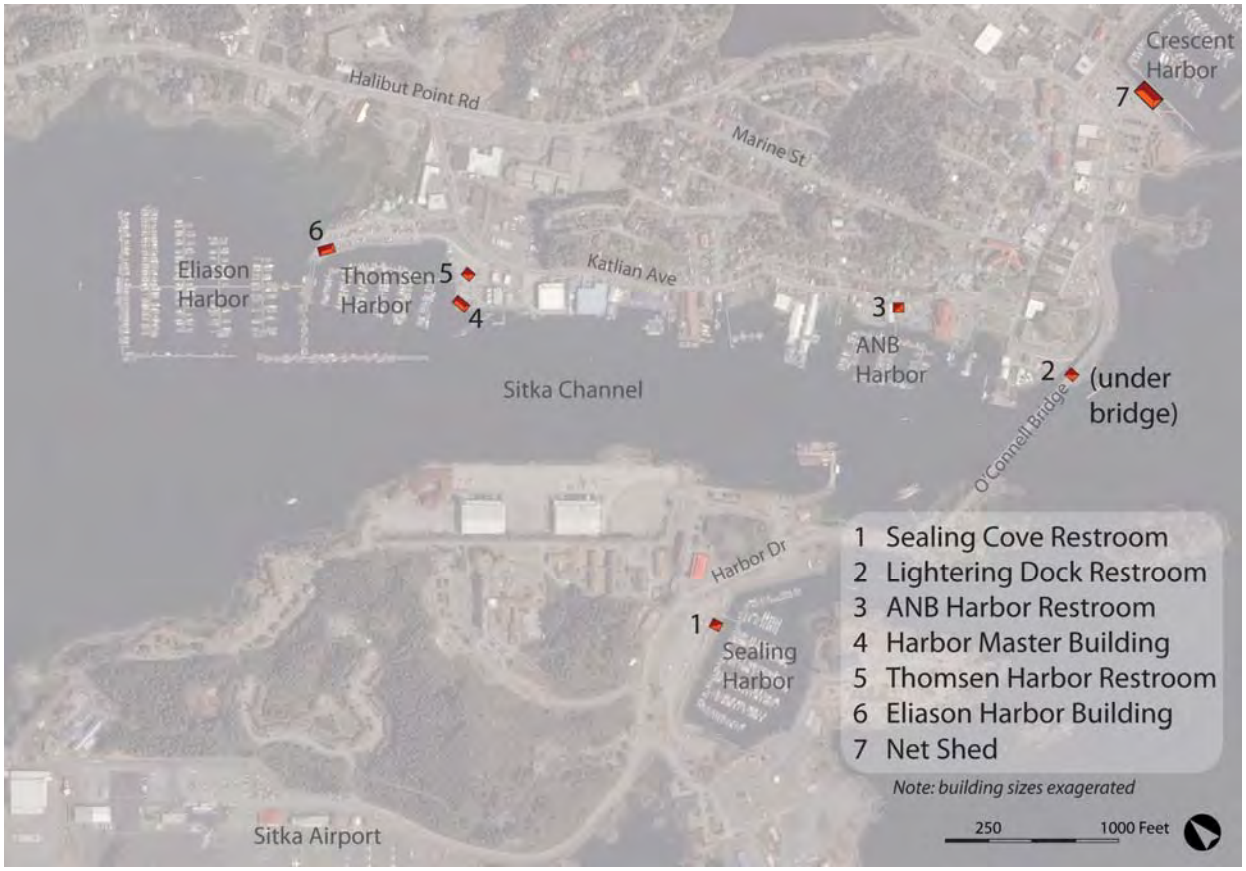


Figure 1. Facility Location Map

Description and Condition

This task was performed by PND's team that included an architect (MAKERS), electrical engineer (Haight & Assocs.), mechanical engineer (Murray & Assocs.), and a civil/structural engineer (PND) and entailed individual walk-throughs of buildings and site observations. The condition survey includes site and building components and systems comprised of the following major groupings:

- Site
- Building Exterior/Envelope
- Building Interior
- Support Functions
- Mechanical
- Electrical

Condition summaries follow for each of the facilities included in this inventory.

Sealing Cove Harbor Restrooms

#1

Location:	Sealing Cove Harbor	Year Built:	1988	Prepared By:	SW
Facility #:		Last Major Building Renovation:		Date:	11/9/11
Facility Name:	Restroom	Total Square Footage:	441		
PRV:	$158,760				
75% of PRV:		# of fixtures (men):	1 WC, 1 urinal, & 1 lav		
50% of PRV:		# of fixtures (women)	2 WC, 1 lav		
30% of PRV:					

Site / Exterior Improvements:

The restroom is located at the edge of the parking lot adjacent to the east gangway and approach dock. The surrounding concrete sidewalks are mostly free from obstructions; there is a crack in the sidewalk outside of the men's restroom, see figure 2. Items surrounding the restroom include uncovered mailboxes.

Structure:

Concrete slab on grade and footings with wood frame construction. The concrete pad is at least five inches above the finished grade. The concrete slab doesn't appear to slope toward the floor drain, creating accumulations of water in the low spots, see figure 3. There are no noticeable failures in the concrete or wood structure; it appears to be in good condition.

Exterior Enclosure / Thermal & Moisture Protection:

The T & G cedar siding and trim appear to be original. Good preventative maintenance including recent paint has kept the exterior wood in good condition. The door hardware does not allow hands free opening. There was no sign of failure; the exterior enclosure elements appear to be in good condition.

Openings:

Entrance doors and frames are metal. Both appear to be newly painted, the doors and hardware are in good working order. There is one vinyl frame awning window. The windows are in good condition.

Interior Finishes:

Interior wall panels are a smooth, hard, nonabsorbent surface and in good condition.

Specialties:

Stainless steel fixtures and metal bathroom privacy screens. The privacy screens appear to be in fair condition.

Mechanical:

Plumbing fixtures are wall mounted and are all stainless steel vandalism resistant type. Water closets and urinals have push button type flush valves. Lavatories have manual faucets with short wrist blade handles. Floor drain in each toilet room. ADA insulation shields are missing from under the lavatories. Plumbing Fixtures are in fair condition. Walk-in plumbing chase between toilet rooms provides good access to piping. Exterior hose bib, key operated. 40 gallon electric hot water tank supplies hot water for facility. No tempering valve is located on the outlet of the hot water tank. On-site sewage ejector pumps the sanitary effluent into the city system. Sewage Ejector appears to be a single pump type; Uniform Plumbing code requires a duplex pump system. Remote sewage ejector panel located in the Janitor Room. Neither toilet room has an exhaust fan which is a code deficiency. Shelf mounted electric heaters are located at a wall penetration for each of the toilet rooms and Janitor room. A heat lamp is located in the plumbing chase to provide heating. Heating system is a poor arrangement and should be upgraded.

Electrical:

This restroom facility is also quite similar to the one at Thomsen Harbor. It includes lighting, heat, exhaust fans, and power distribution. Wall mounted luminaires are installed on the exterior near to the entrances. Surface mounted enclosures with acrylic lenses and 48 inch long fluorescent lamps are installed on the ceiling inside the restrooms. Industrial type strips with fluorescent lamps are installed inside the plumbing chase. The interior lighting is switch controlled from inside the plumbing chase. The exterior lighting is photocell controlled. Small electrically powered heaters with fans are used inside the restrooms. The heat is controlled with thermostats located inside the plumbing chase. A residential type, electrically heated water tank provides hot water. The power distribution is provided with a single phase, 120-240 volt circuit to a small panel board.

Findings

The electrical equipment and circuits are in fair to good condition.

Code Issues:

Limited wheelchair maneuverability. Tempering valve required. Duplex pump system required. Exhaust fans required. ADA insulation shields required under sinks.

Figure 2. Sidewalk cracked at west corner, entrance to men's restroom.

Figure 3. Water ponding in low spots.

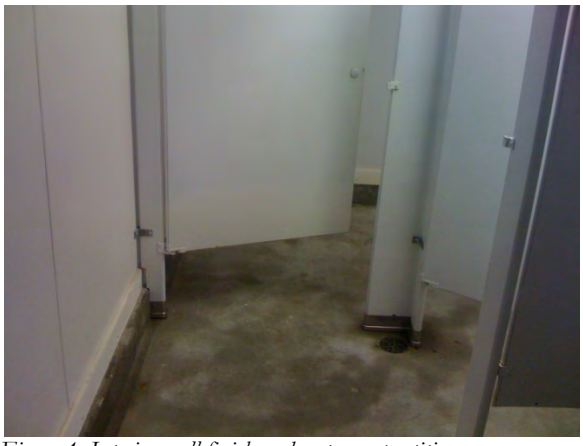


Figure 4. Interior wall finish and restroom partitions.

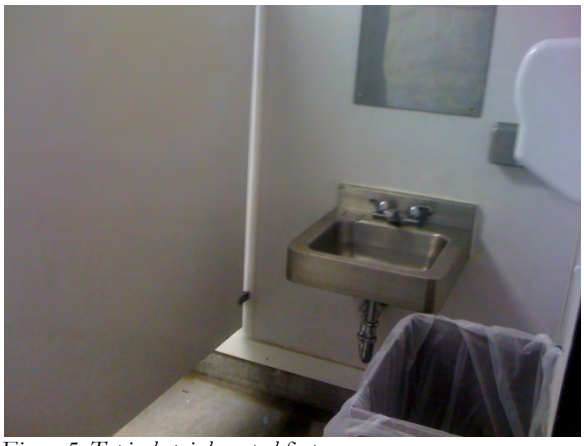


Figure 5. Typical stainless steel fixtures.

Repairs

Immediate

- Exterior Improvement – repair the sidewalk crack outside of the men's restroom.
- ADA compliance – install insulation to the under sink drain to prevent burns to wheelchair users.
- Plumbing – install tempering valve on outlet of hot water tank.
- Install wall mounted toilet exhaust fans.

Short-term

- Replace the three electric heaters with a more permanent system and safer system.
- Replace sewage ejector system with duplex type.

O'Connell Bridge Lightering Float Restroom

#2

Location:	O'Connell Bridge Lightering Float	Year Built:	1997	Prepared By:	SW
Facility #:		Last Major Building Renovation:		Date:	11/9/11
Facility Name:	Restroom	Total Square Footage:	unknown		
PRV:	$108,000				
75% of PRV:		# of fixtures (men):	1 WC, 2 urinal, & 2 lav		
50% of PRV:		# of fixtures (women):	3 WC, 2 lav		
30% of PRV:		Shower:	none		

Site / Exterior Improvements:

The restroom is located adjacent to the O'Connell Bridge Lightering Float gangway, under the bridge. A concrete sidewalk with ADA ramps surrounds the restroom. The site is in good condition.

Structure:

Concrete footings with wood frame construction. There are no noticeable failures in the concrete or wood structure, however, the plywood floor isn't optimal for this use; it appears to be in good condition.

Exterior Enclosure / Thermal & Moisture Protection:

The wood siding and trim appear to be original. There was no sign of failure; the exterior enclosure elements appear to be in good condition. The roof appears to be in good condition.

Openings:

Entrance doors and frames are metal. Both appear to be newly painted, the doors and hardware are in good working order however the jams are rusted at the bottom. There is one vinyl frame awning window. The windows are in good condition, doors and jambs are in fair condition.

Interior Finishes:

Interior wall finish is textured, painted gypsum wallboard, not appropriate for a public restroom. The vinyl floor is worn.

Specialties:

Porcelain fixtures and metal bathroom privacy screens. The specialties appear to be in good condition.

Mechanical:

Plumbing fixtures are wall mounted. Water closets and urinals have flush valves that appear to be low flow type. Lavatories have manual faucets with wrist blade handles. Floor drain in each toilet room. ADA insulation shields are missing from under the lavatories. Both water closets have their flush valve handle on the wrong side for ADA configuration. Plumbing Fixtures are in good condition. Exterior rough-in location on the south side used to serve a dual drinking fountain, which has been removed. 30-gallon electric hot water tank supplies hot water for facility. No tempering valve is located on the outlet of the hot water tank. On-site sewage ejector moves the effluent into the city system. Remote sewage ejector panel located in the Janitor Room. Wall mounted exhaust fans are located in each toilet room and are controlled by their respective light switch. Men's fan operates and seems to be exhausting air. Women's fan operates but does not exhaust air. 2' x2' radiant heating panels are ceiling mounted and controlled by a wall mounted thermostat to provide heating for the restrooms.

Electrical

The restroom facility includes lighting, heat, exhaust fans and power distribution. The electrical equipment and circuits are in fair to good condition.

Code Issues:

ADA insulation shields required under the sinks. Tempering valve required. ADA flush valves are required. Exhaust fan not operating.

Figure 6. Site conditions.

Figure 7. Exterior conditions.

Figure 8. Interior conditions, women's restroom.

Figure 9. Interior conditions, women's restroom.

Repairs

Immediate

- ADA compliance – install insulation to the under sink drain to prevent burns to wheelchair users.
- Interior Finishes – replace the vinyl flooring and base with a waterproof material.
- Plumbing – install tempering valve on outlet of hot water tank.
- Exhaust Fan – repair or replace wall mounted exhaust fan in Women's restroom.

Short-term

- Structural – the plywood subfloor will need to be stiffened/upgraded.
- Interior Finishes – finish the interior walls with a smooth, hard, nonabsorbent surface.

ANB Harbor Restroom

#3

Location:	ANB Harbor	Year Built:	1986	Prepared By:	SW
Facility #:		Last Major Building Renovation:		Date:	11/9/11
Facility Name:	Restroom	Total Square Footage:	361		
PRV:	$129,960				
75% of PRV:		# of fixtures (men):	1 WC, 1 urinal, & 1 lav		
50% of PRV:		# of fixtures (women)	2 WC, 1 lav		
30% of PRV:					

Site / Exterior Improvements:

The restroom is located in the south corner of the parking lot at ANB Harbor, along Katlian Street. A six-inch high concrete walkway encircles the restroom structure. Items located adjacent to the restroom include uncovered mailboxes and waste receptacles.

The site /exterior is in good condition.

Structure:

Concrete slab on grade and footings with wood frame construction. The concrete pad is at least five inches above the finished grade. There are no noticeable failures in the concrete or wood structure; it appears to be in good condition.

Exterior Enclosure / Thermal & Moisture Protection:

The wood siding and trim appear to be original. Good preventative maintenance including recent paint has kept the exterior wood in good condition. There was no sign of failure; the exterior enclosure elements appear to be in good condition. The pitched metal roof appears to be in good condition.

Openings:

Entrance doors and frames are metal. Both appear to be newly painted, the doors and hardware are in good working however, the door hardware does not allow hands free opening. The doors/hardware and jambs and are in fair condition.

Interior Finishes:

Interior walls are finished with a smooth, hard, nonabsorbent surface and in fair condition. The concrete floor is stained in places.

Specialties:

Stainless steel fixtures are out of date; CMU privacy partitions, no doors or privacy screen next to the urinal in the men's restroom. The fixtures and partitions are in fair condition.

Mechanical:

Plumbing fixtures are wall mounted and are all stainless steel vandalism resistant type. Water closets and urinals have push button type flush valves. One water closet appeared to have a leak at the wall connection. Lavatories have manual faucets with short wrist blade handles. Floor drain in each toilet room. ADA insulation shields are missing from under the lavatories. Plumbing fixtures are in fair condition. Walk-in plumbing chase between toilet rooms provides good access to piping although piping has undergone several repairs and renovations such that it is in fair to poor condition. Exterior hose bib, key operated. 20-gallon electric hot water tank supplies hot water for facility. No tempering valve is located on the outlet of the hot water tank. Sanitary appears to gravity drain to street and city system. Neither toilet room has an exhaust fan which is a code deficiency. Wall electric heaters provide heating for each of the toilet rooms. Heating system seems to be adequate but appears old.

Electrical

This restroom facility is quite similar to the one at Thomsen Harbor. It includes lighting, heat, exhaust fans, and power distribution. Wall mounted luminaires are installed on the exterior near to the entrances. Surface mounted enclosures with acrylic lenses and 48 inch long fluorescent lamps are installed on the ceiling inside the restrooms. Industrial type strips with fluorescent lamps are installed inside the plumbing chase. The interior lighting is switch controlled from inside the plumbing chase. The exterior lighting is photocell controlled. Small electrically powered heaters with fans are used inside the restrooms. The heat is controlled with thermostats located inside the plumbing chase. A residential type, electrically heated water tank provides hot water. The power distribution is provided with a single phase, 120-240 volt circuit to a small panel board.

Findings

The electrical equipment and circuits are in fair to good condition.

Code Issues:

ADA insulation shields needed under the sinks. Exhaust fans required. Hands free hardware required. Tempering valve required.

Figure 10. Site conditions.

Figure 11. ADA ramp.

Figure 12. Interior conditions, men's restroom.

Figure 13. Interior conditions, women's restroom.

Repairs

Immediate

- ADA compliance – install insulation to the under sink drain to prevent burns to wheelchair users.
- Specialties – replace the existing fixtures with less institutional looking fixtures that have automatic flushing mechanisms.
- Specialties – install a vandal proof privacy screen between the sink and urinal.
- Plumbing – install tempering valve on outlet of hot water tank.
- Exhaust Fans – install wall mounted toilet exhaust fans in each toilet room.
- Repair leak at wall connection of water closet.

Short-term

- None identified at this time.

Thomsen Harbor
Harbor Department Office Building

#4

Location:	Thomsen Harbor	Year Built:	1994	Prepared By:	SW
Facility #:		Last Major Building Renovation:	Shop addition	Date:	11/9/11
Facility Name:	Harbor Office	Total Square Footage:	1,350		
PRV:	$220,320	Shop:	312		
75% of PRV:		Office:	1,040		
50% of PRV:			4 open offices and 1 private; staff break room for 10; 1 unisex restroom; and shot area		
30% of PRV:					

Site / Exterior Improvements:

The harbor office is located at the northwest corner of the parking lot adjacent to the Thomsen Harbor Gangway. The gravel parking lot abuts the front of the building, providing no pedestrian separation. The north and west sides are surrounded by landscaping while the south end is used for maintenance lay down and storage.

The exterior (front door) is in fair condition.

Structure:

Concrete foundation with wood frame structure (prefabricated). Shop addition (at later date), concrete slab on grade with wood structure. There are no noticeable failures in the concrete or wood structural elements; both appear to be in good condition.

Exterior Enclosure / Thermal & Moisture Protection:

The original siding was L-P siding, an inferior product of wood scraps and resin that did not perform well in wet climates. The original siding was replaced with vinyl siding eight years ago. The roof material is 3-tab 220# fiberglass shingles installed 8 years ago.

There were no signs of failure; the exterior enclosure elements appear to be in good to fair condition.

Openings:

The windows are double glazed with white vinyl frames. Wood doors and frames and wood panel rolling overhead door. All windows and doors appear to be in good condition.

Interior Finishes:

Vinyl coated gypsum wall board and painted plywood and floor finishes (vinyl and carpet) are worn; all are in fair to poor condition.

Specialties:

Wood cabinetry is in good condition.

Mechanical:

Single toilet room with floor mounted water closet and counter lavatory. Water closet is handicapped type. Lavatory does not have insulation under the counter on exposed piping. Plumbing fixtures are in good condition. Two-gallon instant hot water is located under the lavatory for hot water heating. The tank looks to be in poor condition and does not have a tempering valve. Wall exhaust fan exhaust air from the toilet room. Double stainless steel sink, counter mounted, is located in the kitchen. Plumbing fixtures and exhaust fan are in good condition. Domestic water piping appears to be original and is in fair condition. An eyewash station with tempering valve is located outside the toilet room. Wall electric heaters generally supply heating for the Harbormaster's offices. A single zone wet sprinkler system with 2-inch size header serves the building. Shop area has an electric heater. Shop area has exhaust fan with wind damper.

Electrical

The electrical systems at the Harbor Office include power distribution, receptacles, lighting, and data/communications. This building is also served with 120-240 volt, single phase service from the utility transformer in the parking area which also serves the restroom building. The service has a capacity for 100 amperes, and is metered at the building with the main disconnect incorporated into the panel inside the building. It appears that the connected load could be close to 100 amperes.

Receptacles are installed in the walls throughout the interior of the building. The circuits serving these devices appear to be lightly loaded.

Electrically powered heaters are located in all rooms. These are wall mounted, rated to provide 2000 watts each. They are powered at 240 volts with dedicated circuits. The water heater is an "insta-hot" type with a load of 1.35 KVA (11.25 amperes) at

120 volts.

The lighting for the interior is accomplished with 2 ft x 4 ft troffers in the offices with three lamps and 2 ft x 4 ft surface mounted enclosures with four lamps. All lamps are 48 inch long fluorescent with T8 bases. It appears that the ballasts are electronic type. The exterior lighting is accomplished with wall mounted, vandal resistant fixtures with 100 watt lamps. All lighting is switch controlled.

Findings

The service and distribution is loaded to full capacity. The equipment is in fair to good condition. The heating components and receptacles are in fair to good condition.

The luminaires utilize commonly used lamps and appear to be in good condition. When the exterior fixtures are replaced, ones using LED sources are recommended.

Code Issues:

Insulation required on exposed piping. Tempering valve required.

Figure 14. Exterior at west end.

Figure 15. Shop addition.

Figure 16. Staff breakroom.

Figure 17. Customer counter and open office space.

Repairs

Immediate

- Interior – repair/replace gypsum wall board and repaint, replace vinyl flooring and carpeting.
- Install tempering valve on under counter hot water tank.

Short-term

- Site / Exterior Improvements – improve the landscaping; provide an edge between the building and the adjacent parking lot to separate the parking lot and landscaping/pedestrian areas.

- Openings/Doors and Windows – the original windows and doors will reach the end of their life within the short-term and require replacement.
- Replace hot water tank.
- Install wall mounted exhaust fan with speed control switch.

Thomsen Harbor Restrooms

5

Location:	Thomsen Harbor	Year Built:	1976	Prepared By:	SW
Facility #:		Last Major Building Renovation:		Date:	11/9/11
Facility Name:	Restroom	Square footage:	333		
PRV:	$118,800				
75% of PRV:		# of fixtures (men):	1 WC, 1 urinal, & 1 lav		
50% of PRV:		# of fixtures (women)	2 WC, 1 lav		
30% of PRV:					

Site / Exterior Improvements:

The restroom is located in the middle of the parking lot at Thomsen Harbor. The area surrounding the restroom is undefined with no pedestrian separation from the parking area. Items surrounding the restroom include uncovered mailboxes, bike racks, and dock cart parking.

The site conditions could be improved with reorganization of the parking lot and designating pedestrian areas (see figure 18), the condition is poor.

Structure:

Concrete slab on grade and footings with wood frame construction. There are no noticeable failures in the concrete or wood structure; it appears to be in good condition.

Exterior Enclosure / Thermal & Moisture Protection:

The wood siding and trim appear to be original. Good preventative maintenance including recent paint has kept the exterior wood in good condition. There was no sign of failure; the exterior enclosure elements appear to be in good condition. The pitched metal roof is rusted and has been patched several times. Although recently painted it is in poor condition.

Openings:

Entrance doors and frames are metal. Both appear to be newly painted, the doors and hardware are in good working order however the jams are rusted at the bottom. Door hardware does not allow hands free opening. There is one vinyl frame awning window in each restroom. The windows are in good condition, doors/hardware and jambs are in fair condition.

Interior Finishes:

Interior wall panels are a smooth, hard, nonabsorbent surface and in good condition.

Specialties:

Stainless steel fixtures are functional and the privacy screens appear to be in good condition.

Mechanical:

Plumbing fixtures are wall mounted and are all stainless steel vandalism resistant type. Water closets and urinals have push button type flush valves. Lavatories have manual faucets with short wrist blade handles. Floor drain in each toilet room. ADA insulation shields are missing from under the lavatories. Plumbing Fixtures are in fair condition. Walk-in plumbing chase between toilet rooms provides good access to piping although piping has undergone several repairs and renovations such that it is in fair to poor condition. Exterior hose bib, key operated. 50-gallon electric hot water tank supplies hot water for facility and has an old tempering valve on the outlet of the tank. Neither toilet room has an exhaust fan which is a code deficiency. Wall electric heaters provide heating for each of the toilet rooms with wall mounted thermostats located in the walk-in plumbing chase. Heaters are in fair condition.

Electrical

The restroom facility includes lighting, heat, exhaust fans, and power distribution. Wall mounted luminaires are installed on the exterior near to the entrances. Surface mounted enclosures with acrylic lenses and 48 inch long fluorescent lamps are installed on the ceiling inside the restrooms. Industrial type strips with fluorescent lamps are installed inside the plumbing chase. The interior lighting is switch controlled from inside the plumbing chase. The exterior lighting is photocell controlled.

Small electrically powered heaters with fans are used inside the restrooms. The heat is controlled with thermostats located inside the plumbing chase. A residential type, electrically heated water tank provides hot water. The power distribution is provided with a single phase, 120-240 volt circuit to a small panel board.

The electrical equipment and circuits are in fair to good condition.

Code Issues:

ADA insulation shields needed under the sinks. Exhaust fans required. Hands free hardware required.

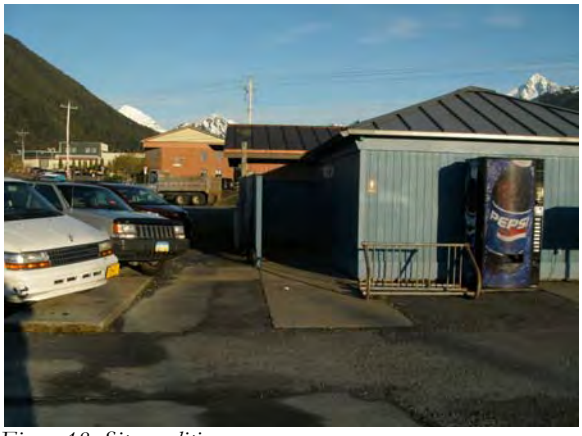


Figure 18. Site conditions.

Figure 19. Entrance door and rusted jamb.

Figure 20. Interior conditions, men's restroom.

Figure 21. Interior conditions, women's restroom.

Repairs

Immediate

- Entry doors – door frames are rusted at the base, replace.
- ADA compliance – install insulation to the under sink drain to prevent burns to wheelchair users.
- Install exhaust fans in each toilet room.

Short-term

- Surrounding site – improve site conditions by organizing surround elements and establishing clear, safe pedestrian routes/paths with adequate vehicular separation.
- Replace metal roof.
- Recommend replacing the thermostatic mixing valve on the outlet of the hot water tank.

Eliason Harbor Restrooms

#6

Location:	Eliason Harbor	Year Built:	1986	Prepared By:	SW
Facility #:		Last Major Building Renovation:		Date:	11/9/11
Facility Name:	Restroom	Total Square Footage:	458		
PRV:	$ 164,880				
75% of PRV:		# of fixtures (men):	2WC, 1 urinal, & 2 lav		
50% of PRV:		# of fixtures (women):	3 WC, 2 lav		
30% of PRV:		Shower:	2 unisex		

Site / Exterior Improvements:

The restroom/shower building is located along the water edge of the parking lot adjacent to the Eliason Harbor Gangway. Items surrounding the restroom include uncovered mailboxes, bike rack, dock cart parking, and beverage dispensing machine. A protective awning/overhang is on the west end of the building.

Site improvement conditions are good.

Structure:

Concrete footings with wood frame construction. The subfloor is plywood; there were no noticeable signs of deterioration however the age indicates that replacement will be required. There are no noticeable failures in the concrete or wood structure; it appears to be in good condition.

Exterior Enclosure / Thermal & Moisture Protection:

The wood siding and trim appear to be original. Good preventative maintenance including recent paint has kept the exterior wood in good condition. There was no sign of failure; the exterior enclosure elements appear to be in good condition. The pitched metal roof appears to be in good condition.

Openings:

Entrance doors and frames are metal. Both appear to be newly painted, the doors and hardware are in good working order however the jams are rusted at the bottom. There two vinyl frame awning windows in each restroom. The windows are in good condition, doors and jambs are in fair condition. The door hardware does not allow hands free opening.

Interior Finishes:

Interior wall panels in the restroom are a smooth, hard, nonabsorbent surface and in good condition. The floor finish is new and in good condition. The tiles on the shower walls are in good condition.

Specialties:

Porcelain fixtures and plastic bathroom privacy screens. The privacy screens appear to be in good condition.

Mechanical:

Plumbing fixtures are wall mounted vitreous china. Water closets and urinals have flush valves. Lavatories have manual faucets with wrist blade handles. Floor drain in each toilet room. ADA insulation shields are missing from under the lavatories. A separate shower room and ADA shower/toilet room are in the complex. Shower is coin operated. Plumbing Fixtures are in fair to good condition. 120 gallon electric hot water tank supplies hot water for facility. No tempering valve is located on the outlet of the hot water tank. Appears to have been a Janitors Sink that was removed, piping rough-in was left. Wall mounted exhaust fans are located in each toilet room and are controlled by their respective light switch. Men's fan operates but seems old with little capacity and past its service life. 2'x2' and 2'x4' radiant heating panels are ceiling mounted and controlled by a wall mounted thermostat to provide heating for the rooms.

Electrical

The restroom facility includes lighting, heat, exhaust fans and power distribution. The electrical equipment and circuits are in fair to good condition.

Code Issues:

ADA insulation shields needed under the sinks. Hands free hardware required. Tempering valve required.

Figure 22. Site conditions.

Figure 23. Awning at west end.

Figure 24. Entrance door and jamb.

Figure 26. Interior conditions, men's restroom.

Figure 25. Interior conditions,women's restroom.

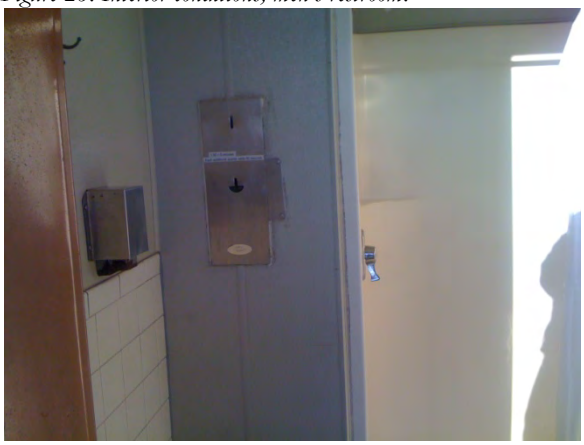


Figure 27. Interior conditions, shower.

Repairs

Immediate

- ADA compliance – install insulation to the under sink drain to prevent burns to wheelchair users.
- Openings – replace rusted door jambs.
- Plumbing – install tempering valve on outlet of hot water tank.

Short-term

- Structure – replace the plywood subfloor when there are signs of deterioration.
- Exhaust Fans – replace the wall mounted toilet exhaust fans in Men's toilet room.

SECTION 4—ELECTRICAL CONDITION INVENTORY

Sitka Harbor Master Plan
Electrical Systems Condition Survey
February 2012

Thomsen Harbor

Existing Systems

The electrical systems at Thomsen Harbor consist of power distribution, shore-tie pedestals, and lighting. Power is provided for most of the vessels with illumination of all of the facility. Communication land lines are not incorporated into the facility. These electrical systems were installed in 2007.

Power Distribution System:

The power distribution system is configured with a service switchboard and distribution panel on the uplands adjacent to the approach dock and gangway to floating docks. Power is received from the utility at 480Y/277 volts, three phase. Feeders exit from the switchboard, also powered at 480Y/277 volts, routed to substations on utility floats at strategic locations along the main floating dock. The switchboard included a utility revenue meter and customer meter allowing the harbor staff to confirm voltages and loads.

The substations along the main floating dock consist of step-down transformers with feeder circuit breakers to the panel boards and main float lighting. The resulting voltage on the feeders from secondary side of the substation is 208Y/120 volts. The substations are configured with two compartments: one enclosing the step-down transformer and the other enclosing the output circuit breakers. The substations are positioned to support the feeder panels for the shore-tie pedestals along both the finger floats and the main float.

The secondary feeders from the substations are routed to panel boards mounted on galvanized steel posts at the main float end of each finger float. The panel boards contain the feeder circuit breakers for the lighting and shore-tie pedestals for the corresponding finger.

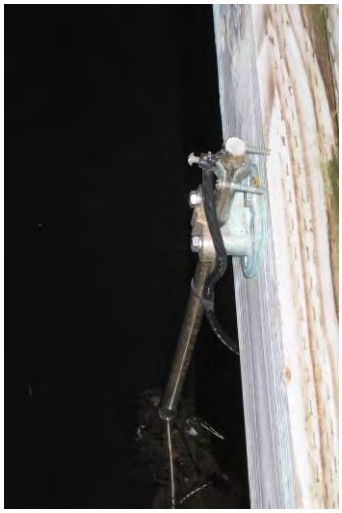
The service/distribution switchboard on shore, the substations, and the panel boards are all housed inside stainless steel enclosures with gasketed access doors to all compartments. All access doors have padlock hasps. The substations are painted, inside and out. All are fabricated for a marine environment.

The feeder cables from the distribution switchboard to the substations, from the substations to the panel boards, and from the panel boards to the shore-tie pedestals and to the luminaires are all manufactured in accordance to the standards set for type

W cables. The cables are insulated with a rating of 2000 volts, utilize finely stranded copper conductors, and are jacketed for hard usage.

All of the feeder cables are routed within the floating docks. The floats are fabricated timber type with the cables routed internally in nonmetallic trays.

The feeder cables from the distribution switchboard to the substations contain four conductors with one conductor used for the grounding system. A cable or set of cables is designated for each substation. The cables from the substations to the panel boards, and onto the shore-tie pedestals utilize five conductors with one used for the grounding system. Each shore-tie pedestal is powered with three phase voltage although many of them are single phase. This allows the pedestals to be connected to alternate phases, thus balancing the cable load and economizing the number of cables installed.



The grounding system is configured with a grid of earth ground electrodes at the service/distribution switchboard. The ground bus inside the switchboard connects the earth ground electrodes, the enclosure, the feeder conductors, and the system neutral to a single node. Similarly, ground buses inside the substations provide single point connections to the feeder ground conductors, their enclosure, the neutral of the transformer secondary, and the seawater electrodes. The seawater electrodes are mounted along the edge of the utility floats with most of the rod submerged into the water.

Shore-tie Pedestals:

The shore-tie pedestals are fabricated with extruded marine grade aluminum enclosure/posts, painted inside and out. The power from the feeders is connected to the pedestal at lugs mounted inside the post slightly more than 18 inches above the dock. The terminal lugs are accessible through an access panel fastened to the front of the post. The access cover uses a paper-like gasket, and is fastened with stainless steel screws. The power is subsequently routed through a meter to circuit breakers and receptacles. Hinged covers are mounted over the receptacles and the circuit breakers, protecting them from precipitation and blown spray. Bollard type luminaires are mounted on top of select pedestals.

The feeders for the pedestals loop from pedestal-to-pedestal. As noted above, the pedestals are alternately connected at the lugs to balance the feeders. Most of the shore-tie pedestals are duplex type with a meter and set of circuit breakers and receptacles serving each vessel.

The meters are digital type with a transducer inside the post translating the current and voltage read from the circuit to the circuit breakers outputting an energy consumption reading (KWhrs) to a digital display on the exterior of the post.

All of the shore-ties are configured with 30 ampere, 120 volt circuits and receptacles. Some of the pedestals designated for larger vessels also include 50 ampere, 208 volt circuits and receptacles. All receptacles are twist-lock type.

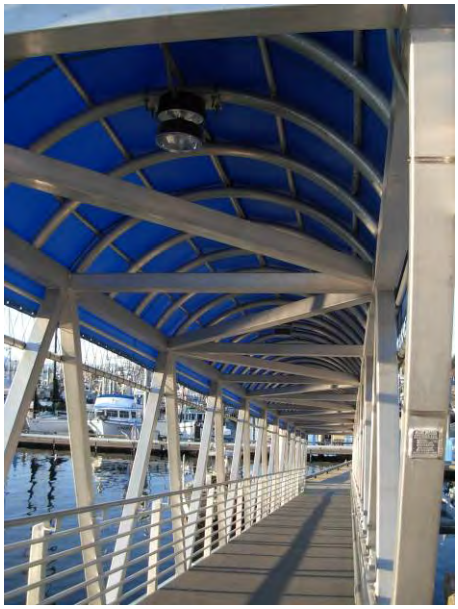
All of the shore-tie pedestals are mounted on a polyethylene pad on the deck with a supporting structure integrated with the floating dock structure. The pedestals are mounted approximately two inches from the bull rail. They are mounted between stall floats thus facilitating a vessel directly on each side.

Uplands Lighting:

The area near the approach dock and gang way is illuminated with a pole mounted luminaire. The luminaire is cast aluminum, painted inside and out. The light source is high pressure sodium. The pole is painted, galvanized steel mounted on a concrete base. The lighting is powered from the Substation BC along the main float and controlled by the daylight/night (photoelectric cell) type sensor.

The parking area is illuminated with roadway type fixtures mounted on tapered round poles. The light sources are high pressure sodium. These luminaires are separately controlled with integral daylight/night type sensors.

Gangway Lighting:



The interior of the covered gangway is illuminated from fixtures mounted at the peak of the covering canopy. The luminaires are surface mount type with enclosing acrylic lenses. The light source is high pressure sodium. This lighting is powered from Substation BC along the main float and is also controlled by a daylight/night type sensor.

Harbor Lighting:

The main floating dock is illuminated from fixtures mounted on posts fastened to the dock structure. The luminaires and posts are similar to those on the uplands near the approach. These are powered from Substation BC and controlled by the adjacent daylight/night controller.

The finger floats are illuminated from fixtures mounted to the tops of the shore-tie pedestals. In some areas where shore-tie pedestals are not installed, bollard type posts similar to the shore-tie pedestals are used. The fixtures utilize high pressure sodium light sources.

The lighting for portions of the main float and each finger float are individually fed from the substations along the main float. A controlling contactor is mounted near the panel for each finger float. The control for the contactors is integrated together with a single daylight/night sensor controlling all of them.

Findings

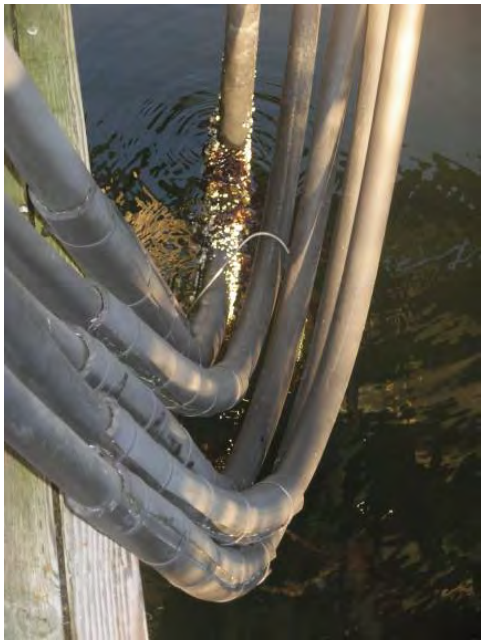
The electrical systems for this harbor were installed in 2007 as previously noted. All systems and system components are essentially new and in good to excellent condition. Given that this is a recent installation, it is anticipated that the system was designed in compliance with the current codes which have not changed with respect to component ratings since installation. Thus, the system capacity is sure to be adequate.

The noted exceptions involve the shore-tie pedestals. The enclosures include hinged covers over the receptacles and circuit breakers as previously noted. The hinges are weak and several are broken or damaged.

The digital metering within the shore-tie pedestals is reportedly failing and difficult to repair and calibrate. The CBS Electric Department is expressing frustration and a preference for conventional, Form 1S, revenue meters. These utility grade meters provide a means for testing and calibration that is already in affect at the department.

Also, the feeder cables from the service/distribution switchboard to the substations transition from the gangways to the main float via support from a galvanized steel post. The loop from the gangway to the post dips into the water during high tides, collecting marine growth and debris. This will reduce their life expectancy. It appears that they can be fastened a little tighter to reduce their contact with the water.

Excepting the above noted issues, the systems and components have a remaining service life of 25 to 30 years.



Thomsen Harbor Breakwater Float

Existing Systems

The breakwater for Thomsen Harbor is connected to the float system for Eliason Harbor. The electrical service for this float system originates from the Eliason Harbor system. The breakwater floats include pole mounted luminaires mounted along the center line of the floating docks. The poles and luminaires are similar to those in the Eliason Harbor.

Findings

The luminaires on the Thomsen Harbor Breakwater float do not exhibit physical abuse like that experienced at Eliason Harbor. With the light poles mounted in the center of the floats, away from the bull rail, there is no pounding on the base of the pole. The poles and fixtures appear to be in fair to good condition.

Eliason Harbor

Existing Systems

The electrical systems at Eliason Harbor consist of power distribution, shore-tie pedestals, and lighting. Power is provided for most of the vessels with illumination of all of the facility. Communication land lines are not incorporated into the facility. These electrical systems were installed in 1997.

Power Distribution System:

The power distribution consists of a single service feeder from the utility transformer to a main distribution panel on the main floating dock. The service feeder is configured with cables connected in parallel. The service power is rated at 480Y/277 volts, three phase.

The service cables are routed beneath the vehicle ramp and transition to the ramp float beneath the ramp. They continue from there to a large junction/terminal cabinet positioned at the foot of the ramp. The cables continue on from there to the main distribution panel.

The main distribution panel is a tall, two section panel mounted on feet to the floating dock, on the centerline of the float. This panel includes circuit breakers protecting feeders to each of five substations.

The substations reduce the service/distribution power to 208Y/120 volts, three phase. They are fabricated with two compartments: one containing the stepdown transformer and the other the secondary power distribution panel. The secondary panel contains the circuit breakers protecting the feeders to the shore-tie pedestals and lighting on the finger floats associated with the respective substation. Each substation supports the shore-tie pedestals on two finger floats.

The service and feeder cables are all manufactured in compliance to standards for Type W configurations with finely stranded conductors, 2000 volt rated insulation, and hard usage jacket. The size and number of conductors in each cable was not investigated.

All of the feeder cables are routed within the floating docks. The floats are all timber type allowing the cables to be internal to the float. The application of supporting trays was not determined.

The grounding system was not investigated. The only grounding components found were bonding straps on conduits in the ramp float beneath the float. Grounding electrodes were not found, however, they might be beneath the substations.

Shore-tie Pedestals:

The vessels are powered from at least three types of pedestals. Some are manufactured by "Marine & Boatyard", some by "Midwest", and some utilizing a generic meter base integrated with a main circuit breaker mounted to a stand. The generic type is utilized in conjunction with a "Hubbell" 100 ampere, three phase, pin & sleeve type receptacle.

The finger floats shore-tie pedestals provide service to the vessels as follows:

Float	Marine & Boatyard		Midwest			Generic
	30A	30 & 50A	30A	30 & 50A	100A	
No. 1				12		1
No. 2				22		
No. 3				30		
No. 4			44	2		
No. 5			34	2		
No. 6			30			
No. 7			26	2		
No. 8			20	2		
No. 9		8		12		1
No. 10		10		6		1
Main				2		

The 30 ampere receptacles are rated at 120 volts and protected with 30 ampere circuit breakers. The 50 ampere receptacles are rated at 208 volts and protected with 50 ampere, two pole circuit breakers. These receptacles are all twist lock type.

The "Marine & Boatyard" shore-tie pedestals appear to be fabricated with stainless steel enclosures and posts with the feeder lugs located in the posts, circuit breakers above on the front, and the receptacles on the sides. The revenue meters are digital type with the transducers inside the enclosure and the displays on the exterior, just below the circuit breakers. A luminaire is mounted at the top of the post. These are duplex type shore-tie pedestals serving two separate vessels.

The "Midwest" shore-tie pedestals are fabricated with power heads fastened to a post. The post is configured to enclose the feeder lugs with circuits routed up to the power heads. The power heads include conventional utility type revenue meters, circuit breakers and receptacles. The circuit configurations and receptacles are similar to those found in the "Marine & Boatyard" pedestals. The post and power head enclosures are all fabricated with sheet metal that appears to be stainless steel, with paint on the exterior. These do not include luminaires on top, but all include two power heads for duplex service to the vessels.

The "generic" shore-tie pedestals are fabricated as noted above. The enclosures for the meters and circuit breakers utilize stainless steel sheet metal, unpainted. The 100 ampere receptacle is mounted to a cast alloy box. These pedestals are simplex type serving only one vessel.

All of the pedestals are mounted on timber floats, fastened to the deck and bull rails with lag screws. They are typically mounted between stall floats thus facilitating a vessel directly on each side.

Uplands Lighting:

There is no lighting located immediately adjacent to the vehicle and pedestrian ramps. The road access and parking area lighting was not investigated.

Gangway Lighting:

The interior of the pedestrian covered gangway is illuminated from fixtures mounted at the peak of the covering canopy. The luminaires are surface mount type with enclosing acrylic lenses. The light source is high pressure sodium. The vehicle ramp is not illuminated. The pedestrian gangway lighting is powered from a panel located at the top of the ramp. The controls were not located.

Harbor Lighting:

The floating docks are illuminated with fixtures mounted to poles. The luminaires are conventional cobra-head fixtures typically used along streets. They utilize high pressure sodium light sources. The poles are tapered round steel type mounted directly to the deck and fastened to the adjacent bull rail. The luminaires mounted to the top of the "Marine & Boatyard" pedestals are not used. The luminaires appear to be controlled from integral daylight/night sensors mounted on top of the fixture.

Findings

As noted above, the electrical systems are approximately 15 years old and with these components typically have a service life of approximately 25 years. However, the components suffer an abnormal amount of mechanical abuse due to storms and waves through the harbor, particularly the north end. The effects are as follows:

1. Shore-tie pedestals: These are mounted with wood spacers between them and bull rail, or up against the bull rail. As boats roll with the waves, they rock into the bull rails, shoving them against the pedestals. This has damaged the pedestal posts and fastenings to the deck.

2. Luminaire posts: These are also mounted against the bull rails. They utilize the bull rails for additional support. However, just like shore-tie pedestals, the bull rail movement has damaged their fastenings to the deck, causing them to lean inward.

3. Substation noise: The substation serving Float Nos. 1 & 10 is quite noisy. It is reported that the noise appeared some time ago, but was not there with the initial installation. The other substations are not so noisy. Reports from the CBS Electric Department indicate that the transformer installation inside the enclosure has been investigated and no evidence of broken fastenings or isolating pads was noted. Hypothetically, it is possible that the pounding produced by the wave surges have caused one or more of the transformer coils to come loose from the core. This transformer needs to be replaced.

4. Feeder cable abrasion: The CBS Electric Department reports that feeder cables have failed within the floating docks at the joints between sections. It appears that these are sections with more active movement, abrading the jacket and conductor insulation of the cables.

5. Master Revenue Meter: There is no utility revenue meter at the entrance to the facility, recording the energy consumption for the whole harbor. The Electric Department does not have the ability to determine the system losses within the harbor.

With the above noted damage, the service life of the components is reduced to 20 years, or less. The power and lighting systems require substantial rehabilitation within the next five years.

Also note that the "Marine & Boatyard" shore-tie pedestals utilize digital revenue meters. Again, the CBS Electric Department prefers Form 1S meters as noted previously in the Findings for Thompson Harbor. And note that the lighting on the pedestrian gangway is damaged, leaving the gangway with an inadequate amount of illumination.

Crescent Harbor

Existing Systems

The electrical systems at Crescent Harbor consist of power distribution, shore-tie pedestals, and lighting. Power is provided for most of the vessels with illumination of all of the facility. Communication land lines provide telephone to vessels where requested. These electrical systems were installed when the electrical systems were renovated in 2005.

<u>Power Distribution System:</u>

The power for the Crescent Harbor is provided from two locations along Lincoln Avenue. One utility service is positioned to route power down the gangway at Finger Float No. 2 and distribute to Finger Float Nos. 1, 2, 3, & 4, as well as the main float. Power from the second utility service is routed down the gangway at Finger Float No. 4, distributing to Finger Float Nos. 5 through 7. The feeders to the floating docks are all protected by circuit breakers mounted in panel boards near to the approach end of the gangways. There are no utility revenue meters at the service circuit breakers.

The utility service for Float Nos. 1, 2, 3, & 4 is delivered at 480Y/277 volts using three separate Type W cables routed through raceway beneath the gangway. Each feeder is connected to a substation located along the shore side of the main float, at the head of each of the first three finger floats. The substations reduce the utility power to a usable rating of 208Y/120 volts. One feeder circuit from the substation at Finger Float No. 3 serves the panel board near the foot of the gangway at Finger Float No. 4. This panel feeds the shore-tie pedestals on Finger Float No. 4.

The utility service for the remaining floats is also delivered at 480Y/277 volts to a terminal box and then to a substation near Finger Float No. 5. This service feeder utilizes two Type W cables also routed beneath the gangway in raceway to the floating dock. This substation again reduces the power to a usable rating of 208Y/120 volts.

The terminal box is mounted to a galvanized steel stand fastened to the floating dock. The panel board is mounted to a set of feet, also fastened to the floating dock.

The substations are fabricated with two compartments: one containing the stepdown transformer and the other the secondary power distribution panel. The secondary panel contains the circuit breakers protecting the feeders to the shore-tie pedestals on the finger floats associated with the respective substation. Lighting on the main float is delivered from the substation at Finger Float No. 2. Each substation is mounted on a utility float specifically designated for its purpose. All are timber type floats.

All of the enclosures for the substations and the panel board appear to be stainless stell type sheet metal. The enclosures for the substations are all painted inside and out. The panel board is unpainted.

All of the feeder cables are routed within the floating docks. The floats for the first four finger floats are timber, as is the main float past Finger Float No. 4. The remaining floating docks are concrete type. The cables are routed internally in the wood timber floats in nonmetallic trays. The cables in the concrete floats are mounted along the sides beneath the walers on stainless steel brackets.

Portions of the grounding system were found during the investigation. Rod type electrodes were found near the substations and the panel board along the main float. It appears that all of the Type W cables include a ground conductor. Electrodes were not found on the shore side, but anticipated to exist and are buried as typical for this type of installation.

<u>Shore-tie Pedestals:</u>

The shore-tie pedestals are fabricated with extruded marine grade aluminum enclosure/posts, painted inside and out. The power from the feeders is connected to the pedestal at lugs mounted inside the post slightly more than 18 inches above the dock. The power is subsequently routed through a meter to circuit breakers and receptacles. Hinged covers are mounted over the receptacles and the circuit breakers, protecting them from precipitation and blown spray. Bollard type luminaires are mounted on top of select pedestals. These pedestals are similar to those installed at Thompson Harbor.

The feeders for the pedestals loop from pedestal-to-pedestal. Most of the shore-tie pedestals are duplex type with a meter, set of circuit breakers, and receptacles serving each vessel.

The meters are digital type with a transducer inside the post translating the current and voltage read from the circuit to the

circuit breakers outputting an energy consumption reading (KWhrs) to a digital display on the exterior of the post.

All of the shore-ties are configured with 30 ampere, 120 volt circuits and receptacles. Some of the pedestals designated for larger vessels also include 50 ampere, 208 volt circuits and receptacles. All receptacles are twist-lock type.

All of the shore-tie pedestals are directly fastened to the floating docks. On the timber type floats they are fastened with lag screws to the deck and to blocking mounted on the bull rail. They are mounted between stall floats thus facilitating a vessel directly on each side, and permitting the cables to the vessels to be routed without creating tripping hazards.

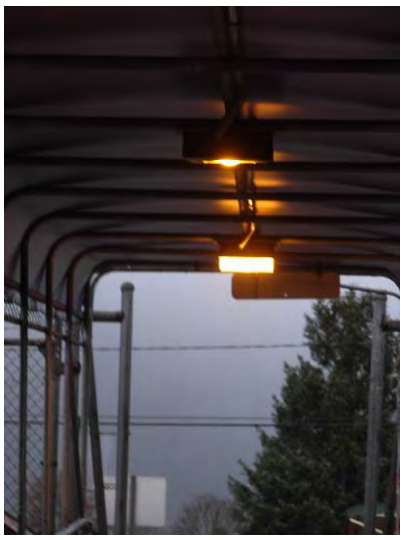
On the concrete type floats, most of the pedestals are mounted on the triangular plate between the finger float and the stall float. In this case, each pedestal serves a vessel on each side of the stall float. In some cases, the pedestals are mounted with the back portion of the post fastened to the waler with lag screws and the front portion anchored to the concrete.

The finger floats include shore-tie pedestals with vessel services and lighting as follows:

Float	30A	30 & 50A	30A, 50A(1 Ph), 50A (3 Ph)	Bollards
No. 1	8	15	1	5
No. 2	4	23	1	
No. 3	32			
Main	13			2 + 4 Poles
No. 4	40	2		
No. 5	39			
No. 6	48			
No. 7	72			2

Upland Lighting:

The uplands and the lighting for it is managed and maintained by other CBS departments. Thus it was not part of the investigation. It was noted that roadway type luminaires are mounted on utility poles adjacent to the approach to the gangways.



Gangway Lighting:

The interior of the covered gangway is illuminated from fixtures mounted at the peak of the covering canopy. The luminaires are surface mount type with enclosing acrylic lenses. The light source is high pressure sodium. These luminaires are quite similar to those mounted in the gangway at Eliason Harbor. The gangway lighting is powered from a panel located at the top of the ramp. The controls were not located.

Harbor Lighting:

The main floating dock from the gangway to the Centennial Building parking lot to the gangway at Finger Float No. 4 is illuminated with post mounted luminaires.

The main float from Finger Float No. 4 toward Finger Float No. 5, and on is illuminated from pedestal mounted luminaires and bollard type luminaires.

The finger floats are illuminated from fixtures mounted to the tops of the shore-tie pedestals. In some areas where shore-tie pedestals are not installed, bollard type posts similar to the shore-tie pedestals are used. The fixtures appear to utilize high pressure sodium light sources. These luminaires are similar to those installed to illuminate the finger floats at Thompson Harbor.

The post type luminaires utilize roadway type fixtures mounted to tapered round steel poles. The poles are mounted directly to the timber decks and bull rails. The fixtures, poles, and installation details are similar to those at Eliason Harbor.

The post type luminaires appear to be powered from the substation at Finger Float No. 2, and controlled at an adjacent enclosure. The shore-tie pedestal luminaires appear to be powered from within the pedestal, on the line side of the meters. They each have daylight/night sensors mounted into the pedestal post controlling their specific luminaire.

The bollard type luminaires are mounted to posts similar to the shore-tie pedestals with no shore-tie receptacles. These bollards appear to be powered from circuits derived from a shore-tie pedestal with circuit protection on the line side of the shore-tie meters. The control is similar to that for the luminaires on the shore-tie pedestals.

Findings

The electrical systems for this harbor were installed within the past ten years and overall appear to be in good condition. The systems in this harbor receive little mechanical damage due to wave action or storms. The equipment and materials installed with the recent upgrade all have a service life of 30 years or more. Thus, the facility retains better than 20 years of service life. The exceptions to this statement follow:

1. The service cables mounted beneath the gangways are submerged in the water, and this condition appears to exist for much of the tide. The collection of marine growth and their exposure to heavy debris are wearing the supports both on the gangway and at the float. If the cables are repositioned soon to elevate them above the water surface, they will probably survive the remainder of their typical service life.
2. The feeder cables mounted beneath the walers on the concrete floats are also submerged and collecting marine growth. However, they are not terribly exposed to damage from debris. They will probably provide an additional 15 years of service life.
3. The supports for the feeder cables beneath the walers are currently in fair condition with some corrosion, but they will require periodic attention to ensure that the cables stay in their present position.

4. With the lack of damaging wave action, the shore-tie pedestals and light posts fastened to the timber float decks and bull rails seem to be surviving with little ill effect. However, some pedestals have been damaged due to vessel contact with the bull rails. This damage will require periodic attention.
5. The shore-tie pedestals mounted to the triangular plates along the concrete floats are well fastened and are surviving quite well. However, those fastened to the walers on these floats require periodic attentions to maintain appropriate support. These need a new type of support system.
6. Like the shore-tie pedestals at both Thompson and parts of Eliason Harbors, digital revenue meters are used. These are reportedly problematic for the CBS Electric Department due to their inaccuracies and difficult maintenance procedures. As previously noted, the Electric Department prefers application of Form 1S meters.

7. The shore-tie pedestals in this harbor are similar to those in Thompson Harbor as previously noted. Characteristically, the hinged covers on these pedestals are exhibiting a greater amount of damage.
8. The luminaires beneath the gangway canopies have failed and have no service life remaining. These should be replaced.

Crescent Harbor
Lightering Float

Existing Systems

The electrical systems for Crescent Harbor Lightering Float include only lighting. The equipment and circuit configurations are similar to those for Crescent Harbor

Findings

The conditions found at the lightering float are quire similar to those found in Crescent Harbor. The luminaires appear to be in good condition.

Crescent Harbor
High Load Dock & Net Shed

Existing Systems

The electrical systems at the Net Shed consist of lighting and receptacles inside the shed. The devices are powered from a post mounted power center near to the shed. The power center consists of a panel and lighting controls. The panel provides circuit protection for three branch circuits. One is for lighting and two are for receptacles. The circuits consist of single conductors routed through conduit.

The lighting consists of floodlights mounted to the beams with four aimed toward the floor and two aimed up at the roof. The luminaires use 70 watt high pressure sodium light sources. The lighting is controlled to allow both manual and automatic control. With automatic control, the lighting is operated with darkness and when activated to manual operation, the lighting operates continuously. The photocell used to facilitate automatic controls is mounted on the roof.

Findings

The luminaires and receptacles have reached their service life, although they are in fair condition. The photocell is located to operate lighting located outside. It does not fairly represent the illumination levels inside the shed.

With future lighting upgrades, consideration should include the application of floodlights with LED light sources. The controls should include the application of step dimming and motion sensors allowing the daylight controls to activate the lights to a low level with darkness and motion sensors to increase illumination to full brightness when people enter the shed. The value will not only be decreased energy consumption due to the light source, but a remarkable decrease due to the control configuration. LED light sources can change illumination levels quite rapidly without warm-up time commonly experienced with high pressure sodium lighting.

ANB Harbor

Existing Systems

The electrical systems at the ANB Harbor consist of power distribution, shore-tie pedestals, and lighting. Power is provided for most of the vessels with illumination of all of the facility. Based on the type of equipment currently active, it appears that the shore-tie pedestals and their feeder cables were installed in the mid 1980's. It also appears that the service system was upgraded approximately 15 years ago.

<u>Power Distribution System:</u>

The utility provides 480Y/277 volt, three phase power to the ANB Harbor. The service feeder is directed from the padmount transformer near the approach dock to an adjacent panel board with two 400 ampere circuit breakers. One is used to protect the feeder to the floating docks. There is no utility revenue meter on the service.

The feeder from the main circuit breaker travels beneath the approach dock and gangway to the floating dock in raceway. This feeder consists of two Type W cables. From beneath the gangway, the cables transition to raceways in the timber gangway float, and then traverse the float to a nearby terminal box. The terminal box interconnects these cables from shore to the cables routed to the substation.

The transformer within the substation reduces the power rating to 208Y/120 volts suitable for the vessels. The transformer is enclosed in one compartment of a marine grade cabinet mounted at the front of the gangway float near the main float. The second compartment of the substation contains the distribution panel for all of the feeders to the shore-tie pedestals and lighting. All of the feeders for this harbor originate at this substation.

All of the feeder cables consist of Type W cables with finely stranded copper conductors, 2000 volt insulation, and hard usage jackets. The cables are routed within the timber floats.

The grounding system was not thoroughly investigated. The shore side ground electrodes as well as the seawater electrodes were not found. It appears that the feeder cables all include conductors dedicated to the grounding system.

Shore-tie Pedestals:

Two brands of shore-tie pedestals are in use at the ANB Harbor. One was manufactured by Midwest while the other was manufactured by Unicorn. Both utilize a post with power heads mounted at the top. The posts and power heads are fabricated with galvanized sheet metal, painted inside and out.

The feeders for the pedestals loop from pedestal-to-pedestal. Most of the shore-tie pedestals are duplex type. All of the shore-tie pedestals are fitted with 30 ampere, 120 volt circuits. A few of the pedestals also include 50 ampere, 208 volt circuits. All of the receptacles are twist lock type. All of the pedestals are single phase type with single phase feeders.

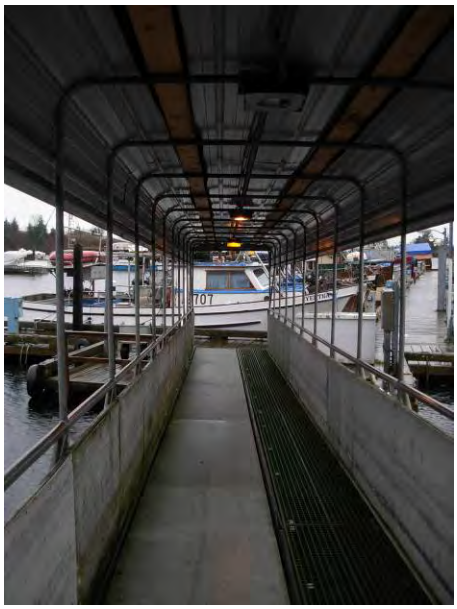
All of the pedestals are mounted on timber floats, fastened to the deck and bull rails with lag screws. They are mounted between stall floats thus facilitating a vessel directly on each side.

The finger floats include shore-tie pedestals with vessel services and lighting as follows:

Float	Unicorn		Midwest		Light Posts
	30A	30 & 50A	30A	30 & 50A	
No. 1	20				5
No. 2			28		5
No. 3	10			10	4
No. 4		2	8		1
Main South			20		4
Main – North	14		14		5

Upland Lighting:

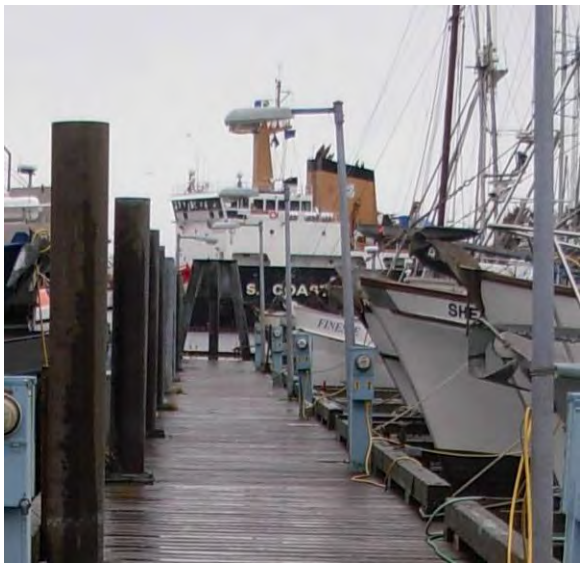
The lighting for the parking area is managed and maintained by other CBS departments. Thus it was not part of the investigation. A roadway type luminaire is mounted on a tapered round steel pole on the approach dock to the gangways. This luminaire is controlled with an integral daylight/night sensor.



Gangway Lighting:

The interior of the covered gangway is illuminated from fixtures mounted at the peak of the covering canopy. The luminaires are surface mount type with enclosing acrylic lenses. The light source is high pressure sodium. These luminaires are quite similar to those mounted in the gangway at Eliason Harbor. The gangway lighting appears to be powered from the substation located at the bottom of the gangway. The controls were not located.

Harbor Lighting:



The floating docks are illuminated with fixtures mounted to poles. The luminaires are conventional cobra-head fixtures typically used along streets. They utilize high pressure sodium light sources. The poles are tapered round steel type mounted directly to the deck and fastened to the adjacent bullrail. The luminaires appear to be controlled from integral daylight/night sensors mounted on top of the fixture. These luminaires are similar to the one on the approach dock.

Findings

The shore-tie pedestals and their feeders appear to have been installed 25 to 30 years ago. Even though they are in fair condition, they have reached and perhaps exceeded their service life. The utility service, feeder to the floating docks, the substation, and lighting all appear to be approximately the same age as the systems for the Eliason Harbor, 15 years old. Overall, this portion of the harbor electrical systems is in good condition with approximately 10 years of service life remaining. The following items identify issues that will require earlier service, or are degrading the systems more rapidly than necessary:

1. Like the other harbors, the feeder cables transiting from the shore facility to the floats dip into the water where they transition from the gangway to the float. The cable supports are failing and the cables will chafe causing a more rapid degradation of the cable.
2. Similar to the installations at the Eliason and Crescent Harbors, the shore-tie pedestals are fastened to the timber docks and bull rails. It appears that the wave action is greater than that at the Crescent, but not as great as that at the Eliason Harbor. The pedestals and the light poles are showing evidence of this activity with leaning poles, pulled fasteners, and bent posts.
3. The lighting within the gangway is damaged with limited illumination of the walking surface.

Boat Grid
Katlian Street

Existing Systems

The Boat Grid is served with 120-240 volt, single phase power. The service is routed from an aerial utility structure and transformer to a load center near Katlian Street. The load center contains the utility revenue meter, panel board with a main circuit breaker, and lighting controls. Stainless steel is used for the enclosure. The panel board is conventionally fabricated using products manufactured by Square D. Circuit breakers with integral ground fault relays protect specific circuits and receptacles along the walkway above the grid.

Receptacles are strategically located along the boat grids on both sides of the dock. These provide power for both small power tools and medium sized equipment, including welders. The receptacles are enclosed in weather-resistant boxes with hinged covers.

The lighting incorporates both pole mounted floodlights, and "wall packs" mounted to the side of the dock and elevated walkways. The floodlights are aimed to illuminate the upper decks of the vessels, or the grid when vessels are not positioned on the grid. The "wall packs" provide illumination of the sides of the vessels with some reflectance to the bottoms. The lighting is controlled with a single contactor. When control is selected to operate manually, the lights are continuously active. When it is selected for automatic operation, a photoelectric cell activates the lights with darkness.

The circuits to the receptacles and the lighting are single conductors contained in conduits. The conduits all appear to be hot-dipped galvanized, rigid steel with corresponding fittings.

Findings

All components and circuits of the electrical systems for the boat grid are in good condition.

Seaplane Float
Katlian Street

Existing Systems

The seaplane float is configured with power for power pedestals, only. The pedestals are positioned to provide power for the float planes landed on the floating ramps. The pedestals are configured much like the shore-tie pedestals for the boats.

The pedestals are fabricated with galvanized sheet metal posts and separate power heads. Like the shore-tie pedestals, the feeder cables are terminated inside the posts with circuits routed from such terminals to the power heads. The power heads contain the utility revenue meters, receptacles and protecting circuit breakers.

Findings

The power pedestals are in fair condition, with little service life remaining.

Sealing Cove Harbor

Existing Systems

The electrical systems at the Sealing Cove Harbor consist of power distribution, lighting, and communications. The entire facility incorporates lighting with power available to most of the vessels, and power available to select vessels. The power and lighting systems are owned and maintained by the City and Borough of Sitka, while the communications systems (telephone and TV) are owned and maintained by the utilities, ACS and GCI. The facility was constructed in 1983 with minor modifications since.

Power Distribution System:

The power system includes two service feeders to the harbor with single phase utility transformers at the head of each approach and ramp. The transformers are pole mount type sitting on concrete pads inside fiberglass enclosures.

Both transformers feed 120-240 volt, single phase power directly to main distribution panels (P1 – East end and P2 – West end) on the gangway floats. The feeders are composed of a four inch conduit with 3 No. 500 MCM and one No. 2/0 AWG ground from the transformers to junction boxes beneath the approaches, and with two No. 4/0 AWG, 4 conductor, type W cables to the main distribution panels. Each service has a feeder capacity of 115 KVA. There is a spare 4 inch conduit from the transformer to the junction box beneath each approach dock.

The distribution panels include 400 ampere main circuit breakers with sub feeder circuit breakers protecting the circuits to the shore-tie pedestal and lighting loads. The systems are bonded to ground at the main distribution panels with single ground electrodes suspended from the gangway float into the water. The panels and circuit protection equipment was manufactured by Square D.

The main distribution panels are mounted on frames fastened to the gangway float, utilizing hot-dipped galvanized steel. The pole supporting the luminaire for the gangway float is incorporated into this frame.

The feeders from the main distribution panels are composed of 100 and 70 ampere, two pole circuit breakers protecting 4 conductor, No. 1/0 AWG Type W cables, and 60 ampere, two pole circuit breakers protecting 4 conductor, No. 2 AWG Type W cables to the shore-tie pedestals. The lighting is composed of 20 ampere circuit breakers protecting No. 6 AWG conductors.

The feeder cables to the shore tie pedestals are routed through a trench incorporated into the Head Walk float. On the Main Walk Floats A through F, and the diagonal portion of the Head Walk float, the cables are routed in 2 inch diameter, PVC conduits embedded in the float concrete from pedestal-to-pedestal.

The feeders to the lighting system are routed up stationary steel poles mounted to the gangway floats where they transition to messenger supported No. 6 triplex cable. The triplex cable is suspended from the pilings with taps to luminaires, also mounted near the tops of the pilings.

Shore-tie Pedestals:

The shore-tie pedestals were manufactured utilizing marine grade aluminum for the enclosures. The enclosures are configured with three parts, the main support post and two meter/shore-tie power heads.

The main post is a nominal 8 inches x 10 inches cross sectional dimension and encloses the terminal lugs for the feeder cables. The power is circuited from these terminal lugs to each power head meter.

Within the power heads, the utility meter is circuited to protecting circuit breakers and shore-tie receptacles. All of the circuit breakers were originally rated for 20 amperes while the receptacles were rated for 30 amperes. Some devices along the diagonal Head Walk have been replaced with higher rated units.

The meters are utility grade, 4 jaw meters suitable for revenue reading.

The pedestals are fastened to both the float and the bull rail.

Uplands Lighting:

The parking area and boat launch ramp are illuminated with street type luminaires mounted on 30 foot tall tapered steel poles along the shoreline. The luminaires originally utilized 250 watt high pressure sodium lamps. They are spaced at 130 foot intervals. The poles at the gangway approaches and at the launch ramp include two fixtures each. Each fixture is controlled by an integral photoelectric cell. The uplands lighting is powered from the transformer at Approach Dock 2 (West end).

Gangway Lighting:

The covered gangways are illuminated with fixtures mounted to the roof structure at a spacing of 22 feet apart. The luminaires are circuited with conductors in steel raceway fed via conductors in flexible conduit. The circuits originate from the main distribution panels.

The luminaires utilize 50 watt high pressure lamps. Each gangway circuit is controlled by a photoelectric cell located on the gangway.

Harbor Lighting:

The lighting system is composed of luminaires mounted near the top of the pilings with a spacing of approximately 80 feet. As noted above, the luminaires are powered from aerial cables suspended just above.

The luminaires are mounted on a short steel pipe bracket at elevation 25 ft, nominal. The original luminaires were manufactured by Thorn utilizing non-metallic enclosures. These fixtures have been subsequently replaced with a street-light type with a flat cut-off lens. The original luminaires utilized 70 watt high pressure lamps. It appears that the current

ones utilize 100 watt lamps.

The lighting system is controlled by Photoelectric cells mounted at each main distribution panel where the lighting circuits originate.

Communications:

With the original facility, a two inch conduit was installed from a shore-side telephone pedestal to the approach dock, and down the gangway to the gangway float. The conduits are now occupied with telephone cables. Television and telephone cables are also strapped to the sides of the conduits.

No provisions were made with the original floats for communications cables. Cables have subsequently been installed along the float walers to designated vessel slips. All services utilize individual cables.

Findings

The electrical systems have supported Sealing Cove Harbor for approximately 28 years. Given their age, the systems are in good condition overall.

Power Distribution:

Utility Transformers: Pole type transformers are not intended or constructed to sit on pads. Although the transformers were not viewed at the time of inspection, similar situations indicate that the bases of the transformer tanks are corroded. They have a remaining life expectancy of less than five years.

Services:

The current National Electrical Code requires main disconnects and circuit protection for the service feeder on shore. There are none with this facility. The NFPA 303 also requires an "Electrical Datum Plane" benchmark installed on shore, preferably near the service equipment. There is none at this facility. The feeder to the main distribution panel P2 from the utility transformer is undersized. See the comments regarding loads later. The cables and conduits are in good condition. The conduits beneath the Approach Dock are in good condition, while those on the gangways are in fair condition, requiring some maintenance. The junction boxes beneath the approach docks are in poor condition.

Main Distribution Panels:

The panels are appropriately rated for the conditions. However, they are constructed of plain steel with paint, thus susceptible to corrosion. The circuit breakers are currently still manufactured and they are thus replaceable. The panels are currently in fair to good condition with five years of service life remaining. Most, if not all of the shore-tie pedestal feeder circuit breakers are under rated. See the comments regarding loads later.

The main distribution panel support structures are in good condition with more than five years of service life remaining. Wireways beneath the panels are non-metallic with steel end plates. The end plates are corroded and need to be replaced.

Shore-tie Pedestal Feeders:

All of the Type W cables are in good condition with 15 to 20 years of service life remaining. However, some of the feeders are not adequately sized in accordance to the current National Electrical Code. See the comments regarding loads later.

Shore-tie Pedestals:

Most of the pedestal enclosures are in fair to good condition. Many of those installed on the B, C, & D Head Walks are bent at the base, or mostly pulled from their deck mounting. This is due to vessels hitting the bullrails and forcing the pedestal posts from their mounts. Although the internal components (circuit breakers and receptacles) are predominantly in good condition, they have reached their service life.

Loads:

The feeders and distribution equipment for this harbor were sized in accordance to state standards in force when the harbor was designed. The National Electrical Code now requires the equipment and feeders to be sized according to the shore-tie pedestal receptacle ratings as stipulated by the code, which is much greater than the past state standards. As a result, some of the feeder cables and the main distribution panel P2 are now undersized. The following table illustrates the current disparity (The current capacity only illustrates the capacity of the cables. In most circuits the circuit breakers are smaller, further reducing capacity):

Feeder	Current Capacity (KVA)	Required Capacity (KVA)
Head Walk A Pedestals		No
Head Walk B – Feeder 1	34.8	51.2
Head Walk B – Feeder 2	34.8	54.8
Head Walks C & D – Feeder 1	25.6	32.9
Head Walks C & D – Feeder 2	25.6	29.2
Head Walks C & D – Feeder 3	25.6	29.2
Head Walks C & D – Feeder 4	25.6	29.2
Head Walk E – Feeder 1	25.6	25.1
Head Walk E – Feeder 2	25.6	20.9
Head Walk E – Feeder 3	25.6	25.1

Head Walk E – Feeder 4	25.6	25.1
Head Walk F – Feeders 1 & 2	34.8	20.9
Diagonal Head Walk	34.8	46.7
Panel P1	76.8	67.2
Panel P2	76.8	148.8

Lighting:

The upland lighting system is in good condition with many years of service life remaining.

The gangway lighting system is in poor condition and needs replacement. The current circuiting may be utilized with some maintenance to give it an adequate service life.

The harbor lighting system is also in good condition with many years of service life remaining. Notably, the aerial cables present a potential conflict with vessel masts. This has been experienced periodically. One piling attachment has failed.

Communications:

The telephone and television circuits on the floating dock are an assembly of randomly installed cables. New cables are installed as required by customers. This has resulted in full conduits to the gangways, and cables strapped to the outside of the conduits. All of these cables have been installed by the utilities. This portion of the facility is in poor condition.

Recommendations

The following items need to be considered as part of any facility upgrades:

Power Distribution:

- Replace the utility transformers with padmount type.
- Provide master metering for both services to the floats.
- Provide service disconnects with protection for the service feeders near the point of access to the Approach Docks.
- Provide a bench mark identifying the "Electrical Datum Plane".
- Upgrade the capacity of the service and main distribution panel P2 to 800 amperes, minimum.
- Consider upgrading the capacity of the service and main distribution panel P1 to 600 amperes. This is not necessary, but prudent if the equipment is replaced.
- Replace the main distribution panels within five years.
- Replace the feeder cables on the Head Walks B, C, and the diagonal Head Walk to sizes as needed to gain compliance with the code. To gain the required capacity, additional feeders may be required on Float B. This will require the installation of a raceway and cable along the edge of the float to a strategic point where the circuits can be separated into two circuits.

- Renovate all of the shore-tie pedestals that are in fair to good condition. This will involve repairing base mounting apparatus and replacing the internal components. The mounting should be revised to address the bullrail movement, and its affect on the pedestal assembly.
- Provide new pedestals for one of the Head Walks, allowing the good pedestals currently on this float to be used as replacements for those that are no longer repairable. All new pedestals should be fitted with utility grade, class 1 meters allowing for revenue readings.

Lighting:

- Uplands: Review the illumination patterns and illumination levels. Consider replacing the fixtures with more efficient types in the future to reduce energy consumption.
- Gangways: Replace all luminaires. Consider application of an energy efficient type (LED). Reuse the existing circuits with the application of repairs. Replace the photoelectric cell.
- Floats: Retain the present lighting system until the floats are replaced. At that time, the luminaires should be replaced with a type mounted to poles, or the shore-tie pedestals, mounted to the floats. This eliminates the conflict of aerial cables with vessel masts and rigging.

Communications:

- Remove all excess circuits.
- Provide a new distribution system with larger (feeder type) cables and small pedestals on the floats with small cables to the desired vessels. This will require a survey of current and project customer needs.

Fisherman's Work Float

Existing Systems

The electrical systems at the Fisherman's Work Float consist of power distribution and lighting. The power and lighting systems are owned and maintained by the City and Borough of Sitka. The facility was constructed in 1988 with minor modifications since.

Power Distribution System:

The power system includes a service feeder from a padmount utility transformer to service equipment located near the access to the Approach Dock. The transformer is a single phase, 120-240 volt utility padmount type installed on a concrete pad.

The service from the transformer to the service equipment consists of a 2-1/2 inch PVC conduit with three No. 4/0 conductors. The service equipment includes a single 200 ampere rated utility meter and two main disconnects. One disconnect/circuit breaker, rated at 200 amperes, serves the Work Float. The other, a 20 ampere, single pole circuit breaker serves the Approach Dock lighting.

The feeder to the Work Float consists of a 2-1/2 inch conduit beneath the Approach Dock with 4/0 conductors to a junction box near the gangway, and a four conductor, No. 4/0, Type W cable routed in PVC on the gangway to the float. The cable is routed beneath the float decking to a panelboard mounted on a support frame near the West piling structure.

The panel board is a 200 ampere, single phase rated load center with plug-in type circuit breakers. This panel serves and protects circuits for numerous receptacles and lighting. The load center is installed inside a non-metallic, NEMA 4 rated enclosure and mounted on a free standing frame fastened to the deck.

The system neutral is bonded to ground at the service equipment on shore. The grounding system is configured with a conductor in the bundle to the panel board on the Work Float. The system includes a second electrode on the Work Float immersed into the water through the float near the pole supporting the panel board. The second electrode is copper clad steel.

Receptacles for equipment power, vessel shore power, and convenience power are located on the panel board support structure and on a pole near the structural pilings on the East end of the float. The convenience receptacles are 120 volt, single phase with ground fault protection integrated into the receptacle. The equipment receptacles are rated 50 amperes with a maximum impressed voltage of 125/250 volts. And the vessel shore-tie receptacles are NEMA L6-30 type.

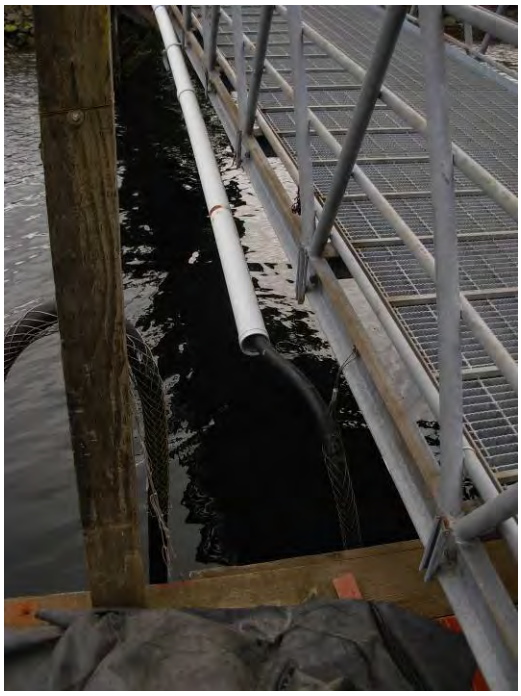
Each equipment receptacle (4 each) is protected with a 50 ampere, two pole circuit breaker. The shore-tie receptacles (2 each) are protected with 30 ampere, single pole circuit breakers, and the lighting and convenience receptacles are protected with 20 ampere, single pole circuit breakers.

The panel board and receptacles are supported with the pole also supporting the luminaire on both ends. The poles and supporting structures are hot-dipped galvanized steel.

<u>Lighting:</u>

The luminaires on the Approach Dock and on the Work Float are cobra head type typically used for street lighting. They appear to utilize 100 watt high pressure lamps and incorporate an illumination cut-off characteristic. All of the luminaires include integrated photoelectric cells.

Findings



The electrical systems have supported the Work Float for approximately 23 years. The power system components have been well used and they are nearing the end of their service life. The lighting system is in better condition with service life remaining.

Power Distribution:

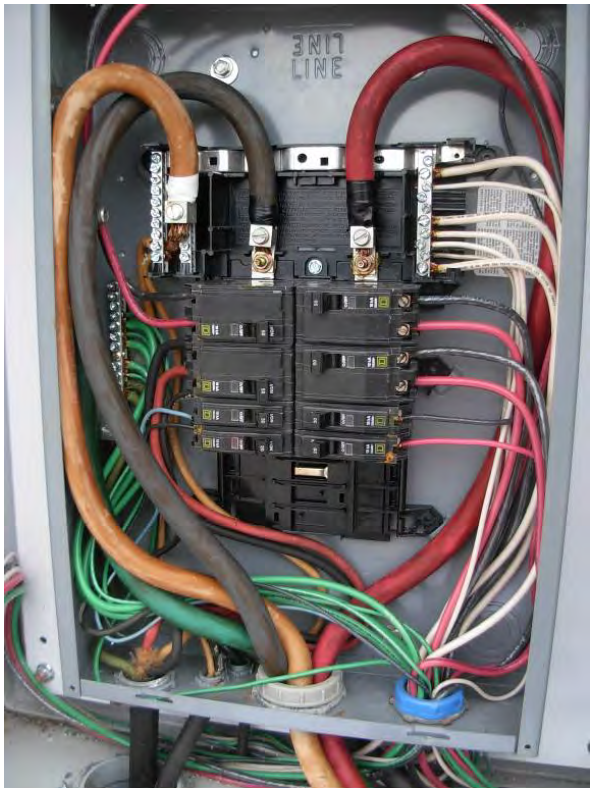
Utility Transformer: The pad mount transformer appears to be in good condition with many years of service life remaining.

Electrical Datum Plane Bench Mark: No bench mark identifying the "Electrical Datum Plane" is located at this facility.

Services: The service equipment located on the shore is in fair to good condition with some corrosion visible on the surface. It appears to have five years of service life remaining.

Grounding: The grounding equipment appears to be in good condition on the surface. The sea water electrode may be corroded beneath the float.

Service Feeder: The service feeder beneath the Approach Dock is in fair to good condition. The junction box beneath the Approach Dock near the gangway is in poor condition and needs replacement. The PVC conduit on the gangway, supporting the Type W cable is in poor condition with broken supports. The type W cable dips into the water at the higher tides exposing it to debris and straining its supports. This portion of the feeder is in poor condition and needing repair in the near future.



Panel Board: The panel board (load center) uses plug-in style circuit breakers. This type is more susceptible to corrosion, heating at points of contact, and failure. It is suitable for a residential application, but not a marine application. It is nearing the end of its service life.

Receptacles: The receptacles are types commonly used for these applications. The equipment and shore-tie receptacles are manufactured to be used in a marine environment while the convenience receptacles are made for commercial applications. The equipment receptacles are not Ground Fault protected. The enclosures are rated for weather applications. All of these receptacles present the appearance of being well used. They are in fair condition with less than five years of service life remaining.

Loads: The applications of the National Electrical Code defining the loads for this facility vary from that for the harbors. This service for this facility serves equipment loads as well as shore-tie power. The diversity factor for the equipment load, which is significant in this case, reduces the overall demand on the system. The calculated load for this facility is 25.4 KVA. The system has a capacity for 38.4 KVA. The service and distribution equipment are adequately rated.

Lighting:

The luminaires all appear to provide adequate illumination of the Work Float and the Approach Dock. The fixtures appear to be in good condition, while the poles are in very good condition. There are no luminaires on the gangway, but it appears that there is a adequate spill from the fixture at the end of the Approach Dock.

Recommendations

The following items need to be considered as part of any facility upgrades:

Power Distribution:

- Provide a bench mark identifying the "Electrical Datum Plane".
- Replace the service equipment on the shore.
- Retain the service feeder conduit to the gangway end of the Approach Dock.
- Replace the junction box beneath the Approach Dock with a conduit fitting.
- Replace the service feeder with a single Type W cable from the service equipment to the panel board on the Work Float. This eliminates the need for a splice and junction box beneath the Approach Dock.
- Replace the ground electrode on the Work Float with a stainless steel type.
- Replace the panel board with a type utilizing bolt-in circuit breakers. Provide it with a marine grade stainless steel enclosure in compliance with a gasketed NEMA 3R characteristics.

- Replace the receptacles with new marine grade types. Utilize circuit breakers with 5 ma ground fault protection for the convenience receptacles. Utilize circuit breakers with 30 ma ground fault protection for the equipment receptacles.

Lighting:

- Retain the present lighting.
- If a covered gangway is installed, provide luminaires beneath the roof.

PART II
MOORAGE RATE RECOMMENDATIONS

Moorage Rate Recommendations for the Sitka Harbor System

Prepared for

City and Borough of Sitka

May 2012

Prepared by

Northern Economics

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Executive Summary

The City and Borough of Sitka (CBS) is undergoing a process to develop a Harbor System Master Plan to help prioritize and budget for maintaining and replacing its harbor infrastructure. This rate study report provides guidance on the moorage rates required to fund the full life cycle costs of the harbor system's operations, maintenance, and replacement needs. In addition to rate recommendations, the report also discusses the Harbor Fund's working capital requirements and presents a preliminary plan for debt issuance to support cash flow needs.

The life cycle cost analysis suggests that, in order to account for inflation, support the cost of debt, and increase the working capital balance to a more appropriate level, a rate increase of approximately 150 percent is required (resulting in rates that are 2.5 times the current rates, for both permanent and transient moorage), followed by annual rate increases of 5 percent. CBS staff developed a five-year implementation plan as an alternative to a single-year increase. This plan would spread the required rate increase over a five-year period, with the trade-off of requiring additional debt issuance to cover short-term cash needs. The Port and Harbors Commission supports a five-year implementation for increasing permanent moorage rates. The recommended moorage rate plan developed by CBS staff is shown in Table ES-1.

Table ES-1. Permanent and Transient Moorage Rates Under the CBS Five-Year Implementation Plan

	Moorage Rate ($ per Foot)				
	Year 1	Year 2	Year 3	Year 4	Year 5
Moorage Type	Flat Rate				
Permanent Annual	31.68	40.44	49.20	57.96	66.72
Transient Daily, 0-80 Feet	0.87	0.91	0.96	1.01	1.06
Transient Daily, 81-150 Feet	1.49	1.56	1.64	1.72	1.81
Transient Daily, 151 Feet or Longer	2.24	2.35	2.47	2.59	2.72

The recommended annual rate increase of 5 percent is based on assumptions of 3.5 percent inflation and 5 percent interest on debt. The rate increase appears to be most sensitive to the inflation rate, particularly the inflation rate for capital costs. If inflation rates are lower in the future than they have been over the past two decades, the annual rate increases could be lowered. Increasing the amount of grant funding is also beneficial, though due to the short-term nature of grants it is most prudent to use grants to offset debt rather than to reduce rates. It is recommended CBS revisit the Harbor Fund's situation every 5 to 10 years, and especially before undertaking major capital improvement projects, to evaluate its rate situation and determine if further adjustments are necessary.

1 Introduction and Overview of the Sitka Harbor System

The City and Borough of Sitka (CBS) is undergoing a process to develop a Harbor System Master Plan to help prioritize and budget for maintaining and replacing its harbor infrastructure. This report represents a component of that master plan and provides guidance on the moorage rates required to fund the full life cycle costs of the harbor system's operations, maintenance, and replacement needs. The rate recommendations are based on a life cycle cost analysis approach, as described in Section 2.2. The report also discusses the Harbor Fund's working capital requirements and presents a preliminary plan for debt issuance to support cash flow needs, as found in Section 2.2.2.1.

This section reviews the harbor system's facilities, user groups, and financial situation. It concludes with a brief discussion of the capital improvement plan prepared by PND Engineers, Inc. Section 2 presents Northern Economics' rate recommendations and a five-year implementation plan developed by CBS staff. Section 3 concludes the report with a discussion of considerations for rate setting, debt issuance, and other implementation needs.

1.1 Sitka Harbor Facilities

The CBS Harbor System is comprised of five harbors with 1,325 stalls and a total of 41,763 linear feet of moorage. Stalls range in size from 16 feet in Sealing Cove Harbor up to 150 feet in Eliason Harbor. Table 1 presents a detailed summary of the stalls available in each harbor.

Table 1. Stall Lengths, Counts, and Total Linear Footage by Harbor

Harbor Facility									
Crescent		Eliason		Sealing Cove		Thomsen		ANB	
Stall Length (Feet)	Count	Stall Length (Feet)	Count	Stall Length (Feet)	Count	Stall Length (Feet)	Count	Stall Length (Feet)	Count
17	110	32	50	16	35	20	47	17	34
24	93	37.5	58	20	107	24	86	30	9
32	62	50	102	24.6	124	30	1	36	18
40	37	62.5	16	30.6	100	32	60	40	34
47	21	75	8	32	5	40	29	50	8
49	21	100	6	41	17	58	1		
73	10	125	1	50	2	74	1		
75	10	150	1			82	1		
11,062 LF total		11,350 LF total		9,767 LF total		6,328 LF total		3,256 LF total	

Source: Eliason (2011) and Northern Economics, Inc. analysis

Other infrastructure managed within the harbor system includes the Fisherman's Work Float, Marine Service Center Bulkhead, Thomsen Harbor Breakwater Float, two boat launch ramps, two cruise ship lightering docks, fish cleaning stations, tidal grids, a seaplane base, and parking areas and other uplands improvements.

1.2 Sitka Harbor Users

Sitka's harbors have 1,126 permanent moorage holders, of which 91 percent are Alaska residents. Recreational vessels make up about 60 percent of the user base, with commercial fishing vessels contributing 30 percent and charter vessels and other vessel types making up the remaining 10 percent. Table 2 summarizes the permanent moorage holders in the harbor.

Table 2. Composition of Local Fleet, Permanent Moorage Holders

	Vessel Type		
Residency	Commercial Fishing	Recreational	Charter
Alaska	294	630	104
Non-Alaska	49	41	8

Source: Jones (2011)

Sitka's harbors also have a waiting list for permanent moorage. The list currently has 278 vessels on it, with ownership split about 80 percent Alaska resident and 20 percent outside Alaska. Most of the vessels on the waiting list are commercial fishing vessels (45 percent), followed by recreational vessels (37 percent). Almost 17 percent of those on the waiting list do not have a vessel or have not specified its type.

Table 3. Vessels on Waiting List

	Vessel Type			
Residency	Commercial Fishing	Recreational	Charter	Not Specified
Alaska	102	84	3	36
Non-Alaska	24	18	1	10

Source: Jones (2011)

Other users of harbor system facilities include cruise ships, seaplanes, and other craft. This analysis focuses only on those vessel types shown in Table 2 and Table 3.

1.3 Harbor System's Financial Situation

The harbor system currently charges a moorage rate of $1.90 per linear foot per month of permanent moorage and a tiered rate structure ranging from $0.35 to $0.90 per linear foot of daily transient moorage. A summary of historical moorage rates is shown in Table 4 for permanent users and in Table 5 for transient users.

Table 4. History of Sitka Harbor's Permanent Moorage Rates

Year	Moorage Rate ($ per Linear Foot per Month)
1990-1999	0.80
2000-2002	1.05
2003-2004	1.30
2005	1.75
2006-present	1.90

Source: Tadic (2012)

Table 5. History of Sitka Harbor's Transient Moorage Rates

Year	Moorage Rate ($ per Linear Foot per Day)
1987–1989	0.10
1989–1990	0.12
1991	0.17
1992–1994	0.20
1995	0.24
1996–1999	0-80 Feet: 0.24 81-150 Feet: 0.48 >150 Feet: 0.75
2000–2004	0-80 Feet: 0.30 81-150 Feet: 0.50 >150 Feet: 0.75
2005–present	0-80 Feet: 0.35 81-150 Feet: 0.60 >150 Feet: 0.90

Source: Tadic (2012)

Under the current moorage rates, the CBS harbor system has generated an average of $1.35 million annually in moorage revenue, as well as $300,000 of other revenue. This revenue has been sufficient to cover operating cash needs, but it has not been enough to cover depreciation or facility replacement. Raw fish taxes have contributed significantly to the harbor system and have averaged $944,000 over fiscal years 2007–2010, sufficient to keep income before contributions, transfers, and special items at an average of $468,000. The harbor also receives 30 percent of CBS fish box tax revenues, which have averaged about $41,000 each year for the harbor.

Table 6 provides a summary of selected financial data for the harbor system. This information was used as a baseline for evaluating operating costs in our analysis. Note that the fish box tax revenues are not included in this table, but are accounted for as offsetting revenue in the analysis.

Table 6. Summary of Selected Harbor Financial Data, Fiscal Year 2007–2010

	Fiscal Year				Average
	2007	2008	2009	2010	2007–2010
Operating revenues					
Moorage fees	1,363,956	1,386,072	1,347,807	1,316,515	1,353,588
Other	271,200	297,178	350,962	281,987	300,332
Total operating revenues	1,635,156	1,683,250	1,698,769	1,598,502	1,653,919
Operating expenses					
Wages and benefits	684,223	745,589	789,615	748,137	741,891
Travel and training	12,223	12,418	10,565	7,560	10,692
Utilities	139,580	144,672	145,183	133,945	140,845
Repairs and maintenance	98,131	124,930	95,777	196,454	128,823
Contracted/purchased services	22,015	55,405	26,502	30,645	33,642
Interdepartment services	216,581	245,870	228,176	221,887	228,129
Other	217,660	206,220	220,273	197,094	210,312
Depreciation	584,066	697,935	758,856	740,378	695,309
Total operating expenses	1,974,479	2,233,039	2,274,947	2,276,100	2,189,641
Operating loss	-339,323	-549,789	-576,178	-677,598	-535,722
Nonoperating revenues (expenses)					
Investment income	111,652	27,120	139,508	178,225	114,126
State PERS relief	19,008	55,081	57,194	23,647	38,733
Raw fish tax	808,257	911,793	1,139,956	917,991	944,499
Interest expense	-28,980	-104,496	-97,219	-44,120	-68,704
Disposal of capital assets	-100,460				-100,460
Net nonoperating revenues (expenses)	809,477	889,498	1,239,439	1,075,743	1,003,539
Income before contributions, transfers, and special item	470,154	339,709	663,261	398,145	467,817

Sources: City and Borough of Sitka (2008, 2009, 2009, and 2010)

Additional analysis of harbor financial data by the CBS Finance Director (Sweeney, 2012) provides more detail, especially with regard to revenue sources. As shown in Table 7, transient revenue has accounted for 13 to 18 percent of moorage revenue during 2010 through 2012, despite contributing less than this proportion of moorage activity as measured by linear footage. The information provided by the Finance Director was also used in our analysis.

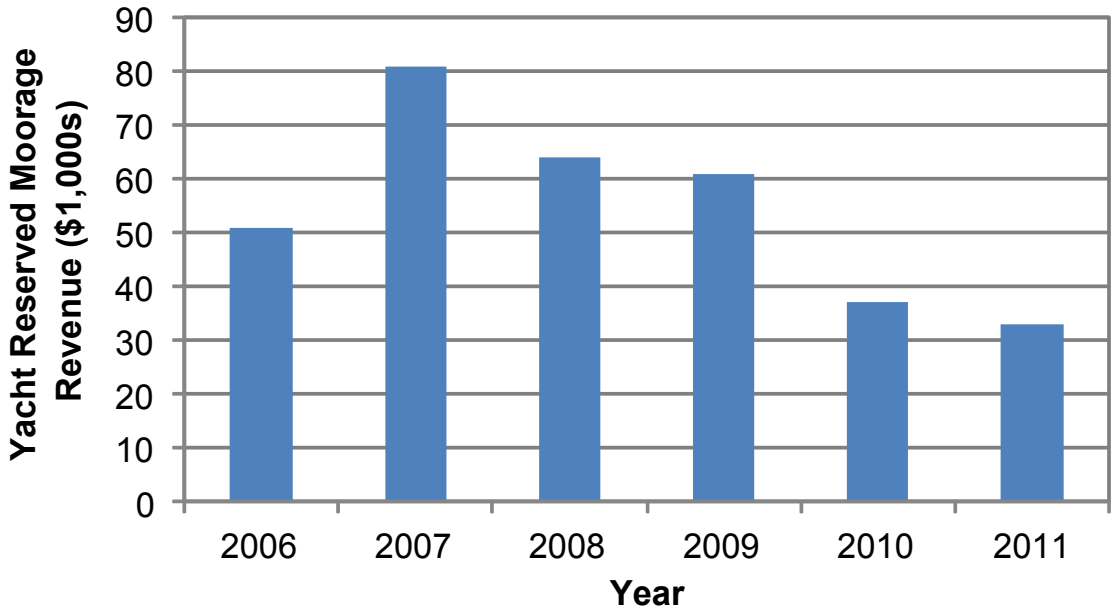
Table 7. Summary of Additional Harbor Fund Financial Detail (Unaudited)

	Fiscal Year		
	2010	2011	2012 (thru Mar 2012)
Revenue			
Permanent Moorage	1,074,403	1,070,127	801,265
Transient Moorage	236,112	226,772	122,763
Lightering Fees	121,236	76,255	54,120
Other Operating Revenue	226,694	277,354	231,129
Total Revenue	**1,658,445**	**1,650,508**	**1,209,277**
Cost of Sales			
Operations	1,017,914	1,124,287	946,128
Jobbing	-	-	6,455
Depreciation	758,856	740,376	528,475
Total Cost of Sales	**1,776,770**	**1,864,663**	**1,481,058**
Gross Margin	**(118,325)**	**(214,155)**	**(271,781)**
	-7.13%	**-12.98%**	**-22.47%**
Selling and Administrative Expenses	**551,695**	**533,168**	**357,962**
Earnings Before Interest and Taxes (EBIT)	**(670,020)**	**(747,323)**	**(629,743)**
	-40.40%	**-45.28%**	**-52.08%**
Non-operating Revenue and Expense			
Raw Fish Tax	917,988	1,195,000	899,646
Other Non-Operating Revenue:	178,224	120,992	134,383
Interest Expense:	44,124	26,724	9,180
Total Non-operating Revenue & Expense	**962,112**	**1,221,724**	**908,826**
Net Income	**292,092**	**474,401**	**279,083**
	17.61%	**28.74%**	**23.08%**

Source: Sweeney (2012)

In 2006, CBS began offering reservations for yacht moorage. Yachts reserve end ties from 100–150 feet and are charged $1.50 per foot per day. Reserved moorage is also available at the 180-foot tender facility, which also offers lockable gangways and a downtown location, at $2.00 per foot per day (Eliason, 2012). Figure 1 shows the revenues received since 2006 from reserved yacht moorage.

Figure 1. Yacht Reserved Moorage Revenues, 2006–2011



Source: Eliason (2012)

1.4 Capital Improvement Projects Plan

PND Engineers, Inc. (2012) developed a plan for capital improvement projects for the Sitka Harbor System in early 2012 as part of this master planning effort. Table 8 summarizes the facility replacement schedule, estimated costs, and anticipated grant funding. The total cost of these projects is estimated at $117.7 million in 2012 dollars. After an anticipated $16.2 million of grant funds,[1] the cost to the harbor fund is expected to be $101.5 million. For complete project details, please see the original plan developed by PND Engineers, Inc.

[1] The base scenario assumes $16.2 million of grant funds. Two additional grant funding scenarios are considered in Section 3.1.

Table 8. Sitka Harbor System Master Plan Capital Improvement Projects

Facility	Total Recommended Project Budget ($)	Anticipated Grant Funding ($)	Anticipated Sitka Harbor Fund ($)	Project Year
Net Shed Roof Repairs	139,108		139,108	2013
ANB Harbor	8,245,166	4,122,583	4,122,583	2013
Crescent Harbor Upland Access and Parking - Multi-Use Lot	1,288,052	1,288,052	0	2013
Crescent Harbor Boat Launch Ramp Upland Access and Parking	117,501	117,501	0	2013
Seaplane Float	11,200,000	10,640,000	560,000	2014
Thomsen Harbor Upland Access and Parking	638,550		638,550	2014
Thomsen Harbor Breakwater Float	4,948,169		4,948,169	2015
Crescent Harbor - 1965 Era	6,240,267		6,240,267	2016
Marine Service Center Bulkhead	5,862,780		5,862,780	2017
Eliason Harbor Electrical Replacement	2,309,175		2,309,175	2017
Sealing Cove Harbor Maintenance Repairs	700,000		700,000	2017
Sealing Cove Harbor Boat Launch Ramp	965,250		965,250	2019
Crescent Harbor Boat Launch Ramp	330,413		330,413	2019
Sealing Cove Harbor Upland Access and Parking	748,440		748,440	2020
Sealing Cove Harbor Boat Launch Ramp Upland Access and Parking	270,270		270,270	2020
Crescent Harbor Upland Access and Parking - Lincoln Street Lots	248,923		248,923	2020
Eliason Harbor Upland Access and Parking	993,094		993,094	2021
ANB Harbor Upland Access and Parking	496,733		496,733	2021
Fish Cleaning Float	280,108		280,108	2021
Fisherman's Work Float	2,400,131		2,400,131	2022
Thomsen Harbor Restroom	213,543		213,543	2026
Crescent Harbor - 2002 Improvements	9,711,232		9,711,232	2027
Sealing Cove Harbor (Two Phases)	10,729,660		10,729,660	2027-8
Crescent Harbor Lightering Float	2,084,198		2,084,198	2027
Eliason Harbor (Five Phases)	26,012,894		26,012,894	2032-6
Boat Grid	3,166,020		3,166,020	2032
O'Connell Bridge Lightering Float Upland Access and Parking	373,106		373,106	2032
Fisherman's Work Float Upland Access and Parking	219,409		219,409	2032
Eliason Harbor Restroom	304,425		304,425	2036
ANB Harbor Restroom	226,741		226,741	2037
O'Connell Bridge Lightering Float	1,481,288		1,481,288	2037
Crescent Harbor High Load Dock & Net Shed	4,980,441		4,980,441	2037
Sealing Cove Harbor Restroom	272,884		272,884	2038
Thomsen Harbor Harbor Office	371,725		371,725	2044
Thomsen Harbor	8,940,947		8,940,947	2047
O'Connell Bridge Lightering Float Restroom	197,505		197,505	2062
Total	**117,708,148**	**16,168,136**	**101,540,012**	

Source: PND Engineers, Inc. (2012), as revised

2 Moorage Rate Recommendations for Sitka Harbor System

This section presents our moorage rate recommendations for the Sitka Harbor System, followed by the results of our analysis and a discussion about the life cycle cost approach.

2.1 Recommendations

We provide two recommendations for the Sitka Harbor System:

1. **Increase moorage rates so that they cover life cycle costs.** This can be accomplished using a single increase or a multiple-year implementation plan approved by the Port and Harbors Commission. After the increase, rates should be adjusted annually for inflation and other costs. Rates should also be reviewed every 5–10 years, as well as before major capital improvement projects, to evaluate the need for further rate adjustments.
2. **Increase data collection from harbor users to inform future decision making.**

The following sections discuss each of these recommendations in detail. Other issues considered but not advanced to recommendations are discussed in Section 3.5.

2.1.1 Moorage Rate Increases

Based on our analysis of life cycle costs, Northern Economics recommends CBS increase its moorage rates for the Sitka Harbor System to 2.49 times the current rates, followed by annual rate increases of 5 percent.[2] The result of this change is to increase the current $1.90 per linear foot per month rate for permanent moorage to $4.73 and the transient moorage rate to $0.87, $1.49, and $2.24 per linear foot per day for vessels in ranges of 0–80 feet, 81–150 feet, and over 150 feet, respectively. Table 9 summarizes the recommended rate increases.

Table 9. Recommended Moorage Rates, Single-Year Rate Increase

	Current Rate ($)			Recommended Rate ($)		
Vessel Class	Daily	Monthly	Annual	Daily	Monthly	Annual
Permanent		1.90	22.80		4.73	56.76
Transient						
0–80 Feet	0.35			0.87		
81–150 Feet	0.60			1.49		
>151 Feet	0.90			2.24		

2.1.1.1 Five-Year Implementation Plan

CBS staff and the Port and Harbors Commission have expressed interest in adopting a five-year implementation plan. Doing so would reduce the burden placed on stall holders in the near term, though the eventual rate of increase would be higher as a result of revenue deferrals and the additional costs associated with using debt to cover near-term cash flow needs. Further, spreading the rate increase over time would exacerbate the harbor's financial situation and short-term cash flow

[2] Section 2.2.2.2 and Section 3 discuss the sensitivity of the required annual rate increase to changes in the assumptions.

challenges with respect to the capital improvement plan. Because of these factors, adopting a multi-year implementation plans warrants attention to detail and careful consideration of the effect it would have on overall costs.

Table 10 presents CBS's five-year plan for permanent annual moorage rates. For transient rates, CBS supports a single-year increase in the first year, with annual increases thereafter. The plan for permanent moorage was developed by CBS staff in March 2012 with the support of the CBS Finance Director and Port and Harbors Commission.

Table 10. Recommended Moorage Rates, CBS Five-Year Implementation Plan

	Moorage Rate ($ per Foot)				
Moorage Type	Year 1	Year 2	Year 3	Year 4	Year 5
Permanent Annual	31.68	40.44	49.20	57.96	66.72
Transient Daily, 0-80 Feet	0.87	0.91	0.96	1.01	1.06
Transient Daily, 81-150 Feet	1.49	1.56	1.64	1.72	1.81
Transient Daily, 151 Feet or Longer	2.24	2.35	2.47	2.59	2.72

The CBS rate plan provides a series of increases to arrive at the recommended rate, plus inflation adjustments, over five years. The first year's increase is 38 percent, with smaller increases each year thereafter. After the fifth year, annual inflation adjustments of 5 percent would be needed, as with the single-year increase. This implementation plan could be modified to accommodate a different phase-in period.

Some benefits of a five-year implementation plan include:

- Increasing rates over time allows users more time to plan for the increased cost and budget for it accordingly.
- Gradually increasing the rate allows time for the market to adapt to rate increases.
- Gradually increasing the rate allows time for competing harbors to make their own rate adjustments (for inflation or to cover a greater portion of life cycle costs), reducing the relative size of Sitka's increase.

Potential drawbacks of a five-year implementation plan include:

- Gradually increasing the rate will result in a growing funding shortfall, which will require CBS to issue more debt to cover capital improvement projects in the initial years.
- Total debt issued under a five-year implementation plan could be significantly higher than would be required under a single-year increase, resulting in a higher cost over time.

It is important to note that both plans—a single-year increase and CBS's five-year plan—would require issuance of debt to cover working capital requirements several times over the next 50 years. This debt requirement is addressed further in Section 2.2.2.1.

2.1.2 Harbor User Data Collection

One of the challenges faced in evaluating the harbor's financial situation and the impact of rate changes is a lack of data about the harbor.

It is our understanding that the harbor department will implement a new marina management software package called *Total Marina Package,* produced by Kord Information Systems, LLC. We anticipate this new software will be beneficial and that its implementation represents a proactive approach to getting a better handle on harbor user data.

When the new software is in place, we recommend collecting data on the following items:

- Vessel information for all permanent and transient users
  - Vessel name
  - Vessel type
  - Residence address
  - Length and width
- Facility utilization
  - Permanent moorage paid for stalls
  - Actual time spent in stalls
  - Frequency and duration of transient use of stalls
  - Other services used or fees paid

It appears that most or all of this information may be collected using *Total Marina Package*.

We also recommend that usage data be collected for other facilities and services, such as parking areas (including duration of stay), tidal grids, fish cleaning stations, and boat launches. Some of these facilities and services already have a user fee, while others may not ever have a fee. Nevertheless, collecting this information will help the harbor staff evaluate rates and costs in the future and make better decisions about facility and service management.

Another approach to data collection would be to survey harbor users about relevant issues and the harbor's financial situation. If harbor users are informed about the financial situation, it may help them to understand the proposed changes. A survey might also result in some ideas for improving the situation that have not already been considered.

2.2 Analytical Results and Approach

We used a life cycle cost approach to evaluate the complete cost of operating, maintaining, and replacing the Sitka Harbor System's facilities. Conceptually, we have used this approach to find the total cost of the facilities, expressed in today's dollars, and then develop an annualized cost to be covered through moorage revenues and other sources to achieve financial sustainability.[3] A cash flow model was then developed to evaluate the working capital balance of the Harbor Fund over time to ensure that a minimum working capital balance would be in place at all times and to identify when debt would be needed to address shortfalls.

It is important to note that in the life cycle cost analysis and cash flow model, we have not included depreciation expense. Depreciation is a non-cash expense used when a cost is capitalized and therefore recorded as an expense over the depreciable life of the asset, rather than all in one year. While depreciation is in many ways irrelevant for a public entity since it is not subject to taxation, Government Accounting Standards Board Statement 34 (GASB 34) still requires public entities to recognize it in their financial statements, regardless of funding sources, presumably from the perspective of encouraging municipalities to think about asset value and replacement over time. A life cycle cost model, by definition, assumes facility replacements occur over time and includes an

[3] For more information about life cycle cost analysis and setting sustainable rates, see Fisher (2011) and Fisher (2009).

annualized cost for these replacements. Since facility replacement costs are included and the annualized replacement cost actually exceeds the straight-line depreciable amount, depreciation does not affect the results of the model.

2.2.1 Life Cycle Cost Analysis

The life cycle cost combines the acquisition or construction, operations, maintenance, and replacement cost of facilities over their useful lives. This forward-looking approach uses the time value of money concept to "discount" future life cycle costs over a set period of time (2012–2062 in this case) to a single net present value in 2012 dollars.[4] That cost is then annualized to arrive at an annual portion of the harbor facilities' life cycle costs that needs to be covered by moorage and other revenues.

We estimate operations and maintenance costs to be approximately $1.49 million annually (in 2012 dollars), based on our analysis of the harbor system's financial data. Capital costs are included according to the replacement schedule found in PND's Capital Improvement Projects plan, as shown in Table 8. We have assumed that all capital assets have a 40-year life, based on continued diligence by the harbor staff in performing repairs and proactive maintenance. We assumed $800,000 of raw fish tax revenues would be available each year to offset costs, though the effect of lower raw fish tax contributions is discussed later in this report. We have also assumed that fish box tax revenues allocated to the harbor fund amount to about $41,000 each year.

Our analysis finds that the net present value of CBS harbor facilities' life cycle cost is $68.1 million which, when expressed on an annualized basis, requires that about $3.1 million of costs be covered each year. This annualized cost is expressed in real terms, in 2012 dollars. Going forward, regular rate increases will be needed on an annual basis to account for inflation.

Permanent moorage rates are currently $22.80 per linear foot per year, while transient daily rates are $0.35, $0.60, and $0.90 per linear foot for vessels in the 0–80, 81–150, and >150-foot size classes. The net effect of the moorage rate structure is an average revenue per foot of moorage facility—after adjusting for different user types, turnover, and other factors—of $26.62 per year.

Based on the annualized life cycle cost of $3.1 million, the 41,788 linear feet of moorage space, and the turnover adjustment, our analysis shows that each foot of moorage space needs to generate $66.25 of annual revenue. This represents 2.49 times the current moorage revenue.[5]

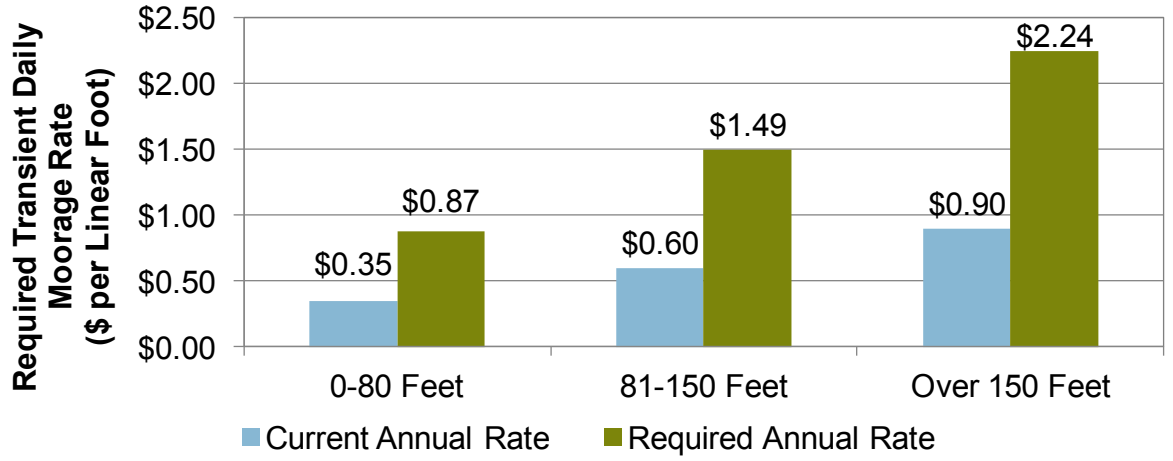
Figure 2 compares the current and required rates for permanent annual moorage, while Figure 3 shows the current and required rates for transient daily moorage. In each case, a moorage rate of 2.49 times the current rate is needed to cover annualized life cycle costs of the harbor facilities.

[4] The life cycle cost model assumes a real discount rate of 3.5 percent. This is higher than the real discount rate of 2.0 percent, based on U.S. Office of Management and Budget guidance (OMB 2011), but it represents what we feel is a more appropriate cost of money than that currently seen in 30-year Treasury bonds.

[5] Revisions to the Capital Improvement Projects Plan since the initial analysis was completed have reduced the life cycle cost of the harbor facilities by deferring capital spending. The revised required increase is 142 percent, or 2.42 times the current rate. However, Northern Economics, Inc. still recommends a 149 percent increase (or 2.49 times the current rate) since it provides for a more conservative approach to dealing with both short-term and long-term needs.

Figure 2. Comparison of Current and Required Permanent Annual Moorage Rate, FY 2012

Figure 3. Comparison of Current and Required Transient Daily Moorage Rate, FY 2012



2.2.2 Cash Flow Model

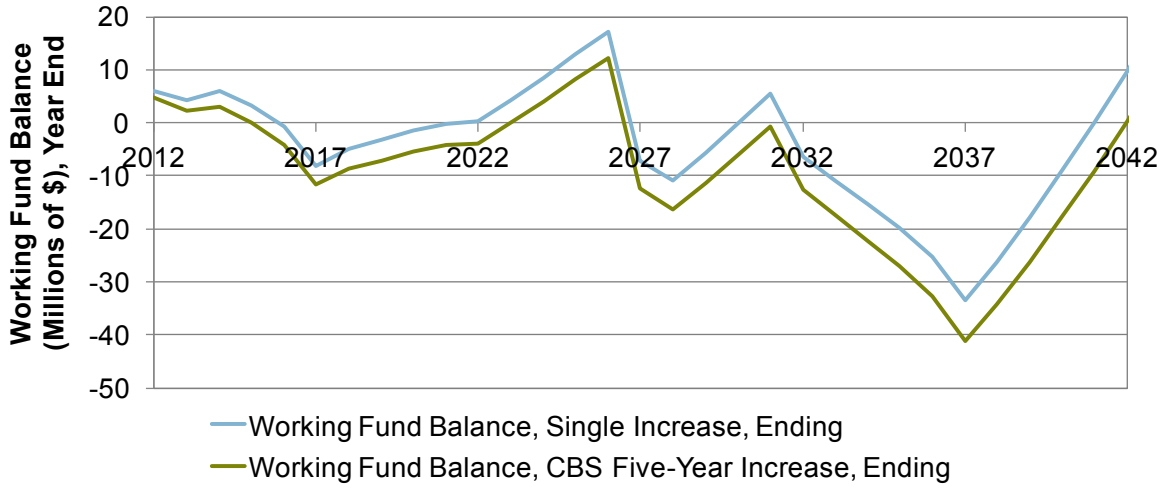
Following the life cycle cost analysis, Northern Economics developed a model of the Harbor Fund's cash flow and working capital balance over the 50-year study period. The model uses the recommended rate structure, annual rate increases, and historical information to estimate revenues received by the Harbor Fund. On the expense side, the model considers both annual operations and maintenance spending and periodic capital project costs.

Rates developed using a life cycle cost approach have a long-term focus, in that they should be sufficient to cover operations, maintenance, and facility replacement over a long period of time. They are not designed to address short-term cash needs in cases in which starting cash balances are insufficient to cover immediate needs. CBS faces short-term cash flow challenges due to a low working capital balance relative to the significant capital investments required to replace harbor facilities over the next several years. Section 2.2.2.1 presents a preliminary debt plan to address these challenges. If CBS opts to implement the five-year implementation plan its staff developed rather than

a single-year increase, these challenges will be exacerbated due to the deferral of revenue, which will lead to an increased reliance on debt.

Figure 4 shows the projected working capital balance for the Harbor Fund based on a starting working capital balance of $3.5 million, annual rate increases of 5 percent after the initial increase(s), and no debt issuances. As the chart shows, CBS will need to issue debt several times to meet the target of maintaining a minimum working capital balance of $4 million.

Figure 4. Projected Working Capital Balance at Recommended Rates, without Debt, Nominal Dollars, 2012–2042

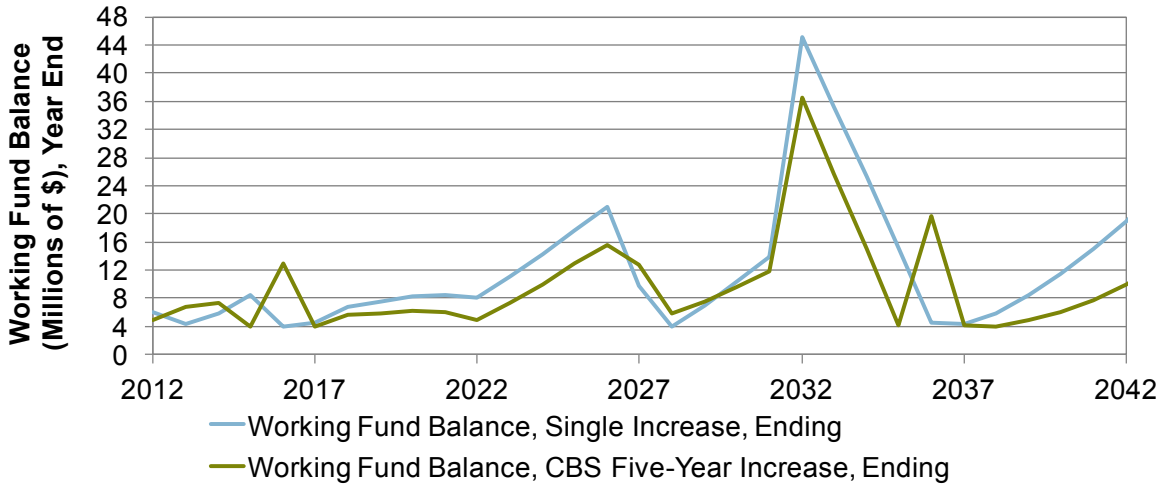


Notes: Dollar amounts are shown in nominal dollars. The chart assumes 3.5 percent inflation and 5 percent annual rate increases.

2.2.2.1 Preliminary Debt Plan

Northern Economics developed a working capital model and preliminary debt issuance plan to address working capital requirements. Figure 5 presents the projected working capital balance of a preliminary debt plan developed with the objective of minimizing the net present value of debt costs and maintaining a working capital balance of not less than $4 million at any given time. The results shown in the figure are preliminary, but are illustrative of the effects of debt on the working capital balance over time.

Figure 5. Projected Working Capital Balance at Recommended Rates, with Preliminary Debt Plan, Nominal Dollars, 2012–2042



Notes: Dollar amounts are shown in nominal dollars. The chart assumes 3.5 percent inflation and 5 percent annual rate increases. The timing and amounts of debt issuances are based on a preliminary plan and should be evaluated prior to issuance.

The preliminary debt plans used to create Figure 5 are shown in Table 11 for a single-year rate increase and in Table 12 for CBS's five-year implementation plan. As shown in the tables, the total debt load required for the five-year implementation plan is approximately one-third higher than is required for the single-year rate increase, due to the deferral of revenues. It is important to note that the debt issuance amounts were set using an optimization process and should be evaluated by a financial professional to ensure the plan meets CBS's needs.

Table 11. Preliminary Debt Issuance Plan for a Single-Year Rate Increase

Year	Debt Issued ($)
2015	5,164,591
2017	8,318,414
2027	14,318,414
2032	45,168,025
2037	13,318,414
Total	**86,287,857**

Notes: Dollar amounts are shown in nominal dollars. The timing and amounts of debt issuances are based on a preliminary plan and should be evaluated prior to issuance.

Table 12. Preliminary Debt Issuance Plan for CBS's Five-Year Implementation Plan

Year	Debt Issued ($)
2013	4,605,945
2016	13,417,621
2027	23,275,470
2032	39,974,777
2036	27,275,470
2047	6,675,470
Total	**115,224,755**

Notes: Dollar amounts are shown in nominal dollars. The timing and amounts of debt issuances are based on a preliminary plan and should be evaluated prior to issuance.

2.2.2.2 Sensitivity to Inflation Rates

Northern Economics recommends a 5 percent annual rate increase following either a single-year rate increase or a multiple-year increase (such as the CBS five-year plan). A 5 percent rate increase:

- Covers inflation
- Provides for the compounding interest of deferred revenues
- Allows the Harbor Fund to catch up to a more conservative working capital balance over time
- Matches the assumed interest rate for debt

The annual rate increase needed to maintain the Harbor Fund's financial position is a function of several factors, including:

- The inflation rate of expenses (especially for capital costs, because they occur discretely rather than uniformly)
- The interest rate of debt
- The mix of debt and equity (or cash) used to fund operations

Due to the complexity of the working capital model, it is difficult to describe the relationship between the necessary rate increase and these and other factors with a great deal of accuracy. However, it appears the capital cost inflation rate is the primary driver of the required annual rate increase due to the debt requirements created by discrete capital expenditures.

Table 13 shows some potential rate increases that would be feasible without changing the debt load significantly from the levels shown in Section 2.2.2.1. The table evaluates inflation rates of 2 percent, 3.5 percent (the base scenario), and 5 percent, and presents an annual rate increase for both a single-year increase and the CBS five-year implementation plan. As shown in the table, if inflation were only 2 percent annually, rate increases could be in the range of 3.85 percent annually, a 23 percent decrease from the base case. If inflation were to be higher, at 5 percent annually, the annual rate increase would need to be around 6.5 percent, a 30 percent increase from the base case. Under the CBS five-year plan the debt load for the high inflation case would be much larger than the base case, which suggests a higher annual rate increase might be advisable, perhaps in the 6.75 percent to 7 percent range.

Table 13. Potential Annual Rate Increases with Different Levels of Inflation

Inflation Rate (%)	Annual Rate Increase (%)	Change in Annual Rate Increase from Base Case (%)	Total Debt Load ($)	
			Single-Year Increase	CBS Five-Year Implementation Plan
2.0	3.85	-23	82,341,744	110,393,490
3.5	5.00	-	86,287,857	115,224,755
5.0	6.50	+30	91,997,269	139,447,176

Notes: Debt amounts are shown in nominal dollars. The timing and amounts of debt issuances are based on a preliminary plan and should be evaluated prior to issuance. Several potential debt levels are possible depending on the amounts and timing and debt issuances, so the potential rates and debt levels are shown for illustrative purposes only.

In the analysis of various rate plans, it is clear that there is a trade-off between annual rate increases and debt loads. Based on some sets of assumptions, it is possible to reduce the annual rate increases substantially, but this is made possible by using a ballooning debt load. The life cycle model is developed with a 50-year outlook; with some sets of assumptions, a seemingly workable debt plan with extremely low rate increases is made possible by setting up catastrophic losses outside the scope of the model. It would be prudent for CBS staff to set a reasonable limit for the outstanding debt load at any given time and then develop rates that require a debt load under that limit.

The next section discusses some considerations for implementing the recommended rate increases.

3 Considerations for Implementing the Recommended Rates

This section discusses some considerations for implementing the recommended moorage rate increase. First, we examine the harbor fund's cash requirements over time and identify periods during which debt will need to be used to cover capital improvements. Second, we evaluate the effect of additional grant funding on the required rate increases and debt issuances. Third, we discuss the effect of raw fish tax revenues on moorage rates and show how additional rate increases would be needed if the harbor system were to lose this $800,000 revenue source assumed in our analysis. Fourth, we discuss the effect of increasing the harbor fund's share of the fish box tax. Finally, we provide some discussion about the effect of rate increases on demand for harbor facilities, followed by some other considerations.

3.1 Effect of Grant Funding

Increasing the amount of grant funding may be beneficial for reducing the necessary annual rate increase or total debt load. Due to the short-term nature of grants, however, it is most prudent to use grants to offset debt rather than to reduce rates.

The base scenario considered in this analysis has four grants for near-term projects, as shown in Table 8 and explained in more detail in Section 3.5.1.1. This section considers two additional levels of grant funding, as shown in Table 14.

Table 14. Anticipated Grant Funding Scenarios

Year Grant Received	Grant Amount by Scenario ($)		
	Base Scenario	Optimistic Scenario	Very Optimistic Scenario
2013	5,721,621	5,721,621	5,721,621
2014	11,397,834	11,397,834	11,397,834
2015	-	2,743,062	2,743,062
2017	-	-	1,786,978
2019	-	-	824,223
2022	-	-	1,692,811
2027	-	9,799,590	9,799,590
2032	-	5,000,000	5,000,000
Total	**15,528,136**	**33,911,198**	**38,966,119**

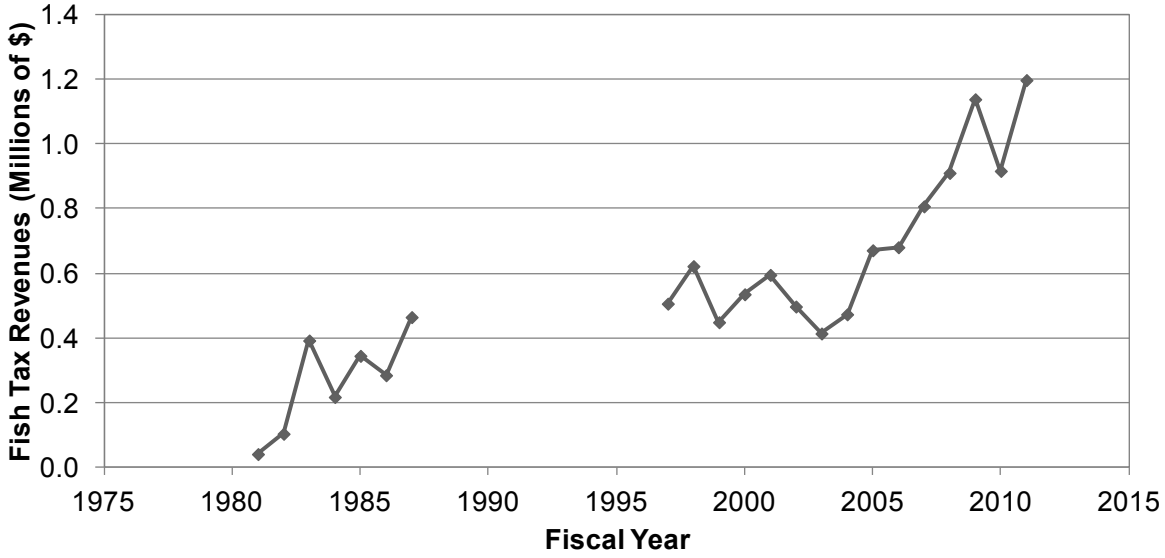
Source: Tadic (2012) and Northern Economics, Inc. analysis
Note: All grant amounts are in nominal dollars.

The analysis presented in this report includes the effects of the base scenario grants received in 2013 and 2014 as part of the rate increase recommendation. Grants received in 2015 and later years could be used to reduce the annual rate increase or reduce the amount of debt issued to support capital improvements. As noted above, Northern Economics recommends that grants be used to offset debt rather than reduce annual rates.

3.2 Effect of Raw Fish Tax Revenues on Harbor Moorage Rates

Figure 6 shows a history of raw fish tax revenues received by CBS since 1981. Under advice of CBS staff, we used $800,000 as a conservative, long-term average amount for raw fish tax revenues, equal to $900,000 total tax less $100,000 retained by the general fund (Tadic, 2011). CBS has seen this level of revenue over the past four years, though earlier years saw lower amounts. Note that no raw fish tax revenues were received in the late 1980s and much of the 1990s.

Figure 6. History of Raw Fish Tax Revenues Received by the City and Borough of Sitka, Fiscal Years 1981-2012



Source: Sweeney (2011) and Northern Economics, Inc. analysis

Figure 7 and Figure 8 look at the effect of that revenue source on the required permanent annual and transient daily moorage rates and estimate the revenue requirement at lower levels of funding. If this source of offsetting revenues were lost, it would cause the life cycle cost to increase by more than 25 percent, highlighting the importance of raw fish tax revenues on the harbor system.

Figure 7. Effect of Raw Fish Tax Revenues on Permanent Annual Moorage Rate

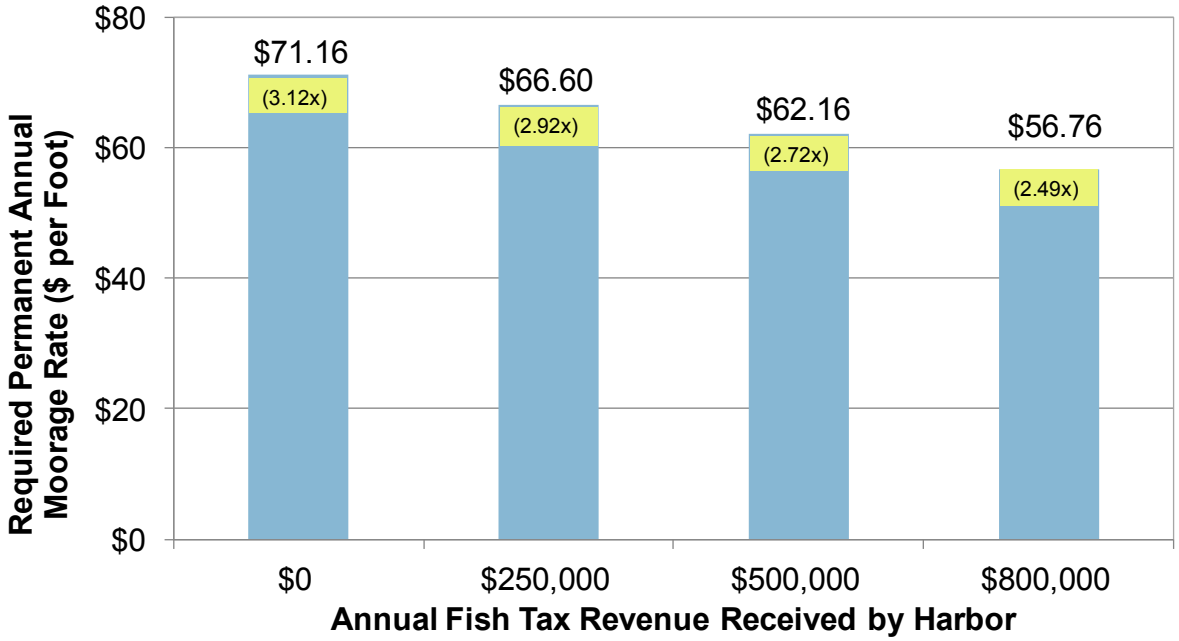
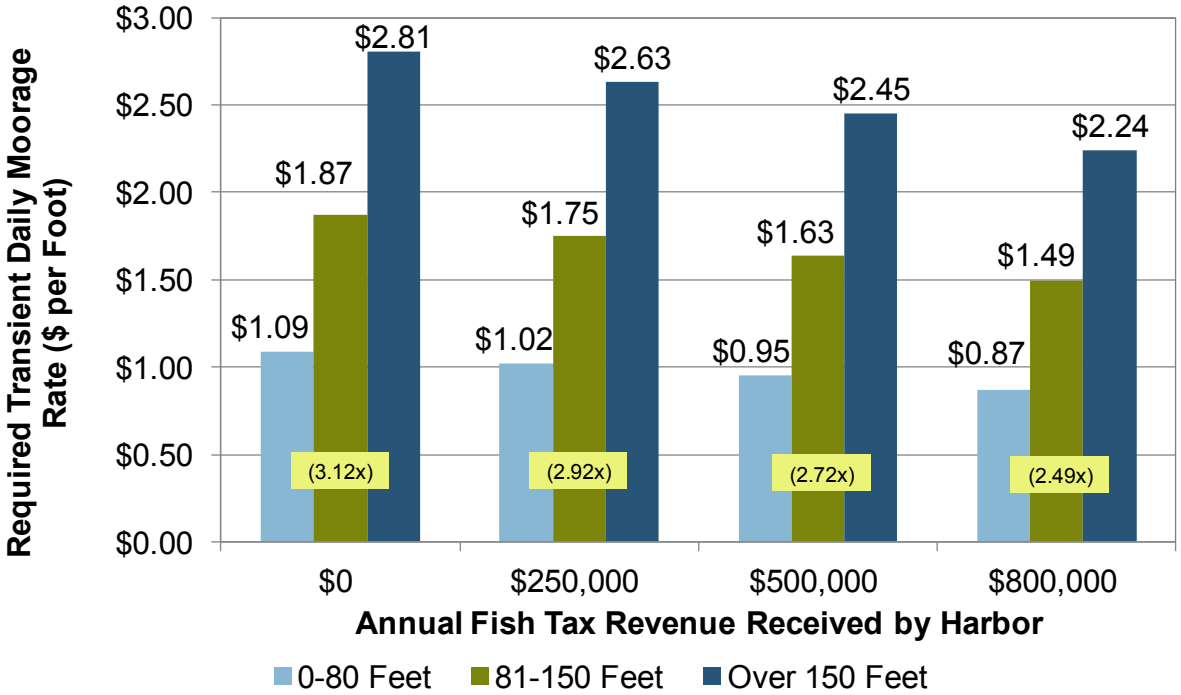


Figure 8. Effect of Raw Fish Tax Revenues on Transient Daily Moorage Rate



3.3 Effect of Increase Fish Box Tax Revenues on Harbor Moorage Rates

CBS collects a fish box tax from charter customers who take seafood that has been packaged (Calkins and Hillhouse, 2007). Revenues collected by CBS have averaged about $135,000 annually over the last five fiscal years, as shown in Table 15.

Table 15. Fish Box Tax Revenues Collected by the City and Borough of Sitka

Fiscal Year	Revenue	Allocation to Harbor Fund (30 Percent of Total)
2012 *(estimated)*	*113,890*	*34,167*
2011	111,530	33,459
2010	107,800	32,340
2009	162,475	48,743
2008	183,952	55,186

Source: Tadic (2012)
Note: Revenues in fiscal year 2012 are estimated based on the year-to-date amount plus $1,000 through the end of the fiscal year, per Tadic (2012).

Currently, 30 percent of the fish box tax revenues are allocated to the Harbor Fund. If the allocation to the Harbor Fund were to be increased to 60 percent, as has been considered in the past, the result would be a small but positive effect on the required moorage rates. This effect, which amounts to a 3.2 percent reduction in the required increase, would be to reduce the required permanent annual moorage rate to $56.00 per foot (versus $56.76 per foot, a $0.76 reduction). The transient rates for the 0–80 feet, 81–150 feet, and over 150 feet size classes would be reduced to $0.86, $1.47, and $2.21 per foot per day (a reduction of $0.01, $0.02, and $0.03), respectively. The effect is summarized in Table 16.

Table 16. Effect of Fish Box Tax Allocation to Harbor on Required Moorage Rates ($ per Foot)

	Fish Box Tax Allocation to Harbor (Percent)	
Moorage Class	30	60
Permanent Annual	56.76	56.00
Transient Daily, 0-80 Feet	0.87	0.86
Transient Daily, 81-150 Feet	1.49	1.47
Transient Daily, Over 150 Feet	2.24	2.21

3.4 Effect of Rate Increases on Demand

Increasing moorage rates at Sitka harbors may decrease demand for the harbor and increase vacancy rates. While our analysis has focused on the life cycle cost of the harbor system's facilities, we understand that rate increases need to be made carefully so as to balance the cost of operating facilities and the demand for those facilities. Ideally, rates will be set so that facilities are fully occupied with a minimal waiting list, representing a perfect match of moorage supply and demand.

The measure of change in demand to change in prices is known in economics as elasticity. While we can hint at what that elasticity measure might be for Sitka's harbor facilities, coming up with a

quantitative estimate would require extensive data about Sitka's harbor facilities as well as facilities elsewhere in Southeast Alaska and beyond.

Permanent moorage holders who live in Sitka, and those who fish commercially out of Sitka, are the most motivated to keep their vessels in Sitka. Residents of other Southeast communities with other reasons for being in Sitka are likely not as strongly committed to keeping their vessels there in the face of increasing rates. Of the permanent moorage holders, those who live outside Alaska and who do not fish in the vicinity of Sitka are the least likely to stay in Sitka's harbors if the rates increase. Additional data are needed to have a better sense of why permanent moorage holders have kept their vessels in Sitka. It may be helpful to survey harbor users to present the situation and ask users what they would prefer be done.

On the transient side, these vessels are least likely to stay in Sitka in the event of large rate changes, relative to other locations. This is a critical issue, since 20 percent of moorage revenues come from transient users. That said, the effect of higher rates on transient use is harder to define as vessel owners may change their usage patterns rather than relocate to another facility. For example, transient users may still use Sitka's harbors but reduce their time there. It is difficult to assess what these changes in behavior might be.

While a comprehensive analysis is not feasible given the multitude of decision variables, we have included a rate comparison that looks at Sitka's current rates, the proposed rates, and the rates for selected other Southeast Alaska communities: Juneau, Wrangell, Petersburg, and Ketchikan. Table 17, on the next page, shows a rate comparison for permanent annual and transient daily moorage at each community. As shown in the table, with the proposed increase, Sitka's rates would be among the highest of those shown. However, a phased implementation plan may help to keep rates more in line with the region since presumably other harbors would need to make inflation adjustments over that time as well.

Table 17. Moorage Rate by Community ($ per Linear Foot)

Harbors	Permanent Annual	Transient Daily	
Sitka (Current)	22.80	0-80 Feet:	0.35
		81-150 Feet:	0.60
		Over 150 Feet:	0.90
Sitka (CBS Five-Year Implementation Plan)	Five-Year Rate Steps	0-80 Feet:	0.87
	Year 1: 31.68	81-150 Feet:	1.49
	Year 2: 40.44		
	Year 3: 49.20		
	Year 4: 57.96		
	Year 5: 66.72	Over 150 Feet:	2.24
Sitka (Proposed Full Increase)[1]	56.76	0-80 Feet:	0.87
		81-150 Feet:	1.49
		Over 150 Feet:	2.24
Juneau Downtown Harbors (Douglas, Harris, and Aurora)[2]	47.40		0.50
Juneau Statter and DeHarts Harbors[3]	79.20		0.50
Juneau Statter and DeHarts Harbors (Reservations, May 1 – Sep 30)		Fishing Vessels:	0.75
		Other Vessels <65 Feet:	1.50
		Other Vessels ≥65 Feet:	2.50
		Other Vessels ≥200 Feet:	3.00
Wrangell	22.00	Pre-Paid:	0.40
		Invoiced:	0.80
Wrangell Summer Floats		0-80 Feet:	0.65
		Over 80 Feet:	0.95
Petersburg	34.08		0.40
Ketchikan (within city limits)	22.98		0.59
Ketchikan (outside city limits)	27.58		0.59

Notes:
[1] The rates shown for the proposed full increase are for the first year only. Rates should increase to cover costs, assumed to be 5 percent annually.
[2] The permanent annual rate does not include an annual moorage advanced payment discount of 5 percent, which would reduce the rate for the downtown harbors to $45.03 per foot.
[3] The permanent annual rate does not include an annual moorage advanced payment discount of 5 percent, which would reduce the rate for Statter and DeHarts Harbors to $75.24 per foot.
Sources: Eliason (2011), City and Borough of Juneau (2011), City and Borough of Wrangell (2011), City of Petersburg (2010), City of Ketchikan (2008)

3.5 Implementation Options

This section discusses implementation options, including funding, scheduling work, and rate options.

3.5.1 Funding Options

This section discusses three funding and financing options for harbor improvements, including acquiring grant funding, using debt financing, and borrowing money from the Southeast Alaska Economic Development Fund.

3.5.1.1 Grant Funding

A variety of grant funding sources may be available to keep down the cost of making harbor improvements. A few of the capital improvement projects shown in Table 8 are assumed to be partially grant funded. Funding is anticipated to come from (Tadic, 2012):

- **ANB harbor:** 50/50 match in the Governor's FY 2013 budget, which amounts to $4.1 million of funding.
- **Seaplane float:** 95 percent funded by the Federal Aviation Administration, amounting to $10.6 million.
- **Crescent Harbor Upland Access and Parking:** fully funded by Legislative Grant Funding, which amounts to $1.3 million.
- **Crescent Harbor Boat Launch Upland Access and Parking:** fully funded by Legislative Grant Funding, amounting to $118,000.

Section 3.1 considers additional grant funding under optimistic and very optimistic scenarios.

Other grant funding may be available but is less certain. Funding may be available through the Alaska Municipal Harbor Facility Grant program, which matches local government funds, dollar per dollar, up to a limit of $5 million, subject to annual legislative appropriation (ADOT&PF, 2011). This funding is competitive and has a scoring process used for project selection. Implementing the recommended rate increase will presumably improve Sitka's scoring relative to other communities given the weight applied to financial ratios within the grant application score matrix.

Facilities related to recreational boating and sport fishing, such as the fish cleaning floats, may be eligible for grant funding from the Boating and Angler Access Program (ADF&G, 2012). Other facilities may be eligible as well.

In addition to state sources, grant funding may be available through the Economic Development Administration (EDA) or U.S. Department of Agriculture (USDA).

Economic Development Administration

The EDA is an agency within the U.S. Department of Commerce that partners with distressed communities throughout the United States to foster job creation, collaboration, and innovation. EDA helps to improve Alaska ports by providing funding for both infrastructure and equipment. EDA helped to fund Sitka's Marine Services Center. Other recent examples of EDA funding of port and harbor improvements are in Port Lions and Bristol Bay Borough. The City of Port Lions received a $1.5 million grant to renovate 35 slips and increase the capacity of the Port Lions Small Boat Harbor with an additional 21 slips (EDA, 2010). Bristol Bay Borough received $2.4 million for the purchase of a crane and two forklifts for its dock in Naknek (EDA, 2009). Each of these projects supports development of the local fishing and ecotourism industries. EDA requires funding applications to show jobs that are created or legitimately saved as a result of proposed improvements.

U.S. Department of Agriculture

The USDA Rural Development section oversees several programs intended to improve the social and economic conditions in rural America, offering business and cooperative loans and grants to promote business and employment. Of the various programs USDA administers, two stand out as programs that could potentially provide financial support to Sitka's harbor system construction projects: the Rural Business Opportunity Grants and the Business and Industrial Loan Guarantee Program. The grants are intended to improve economic conditions in rural communities with 50,000 people or

fewer through the provision of technical, planning, and training assistance (USDA 2005). The loan guarantee program helps to improve the financing terms smaller communities can get when borrowing money by guaranteeing a portion of the loan, subject to some limitations.

3.5.2 Debt Financing

Section 2.2.2.1 presented a preliminary debt plan for funding harbor improvements and meeting working capital balance requirements.

In addition to the use of municipal debt, CBS has access to the Southeast Alaska Economic Development Fund, which currently has a balance of about $1.8 million. Subject to borrowing requirements, a portion of the fund could be used to finance harbor infrastructure projects (Tadic, 2012). Due to the size of the fund, it would not be a reliable source of funds for large projects, but it could contribute a portion of the funds needed.

3.5.3 Capital Scheduling Options

CBS could investigate deferral of capital costs and maintenance activities in order to postpone and reduce cash outflows.

To some extent, PND Engineers, Inc. has already considered deferment of capital costs as a way to spread out the cash needs of the harbor system over the next five to ten years. As long as existing assets are adequately maintained until replacement, this should have a positive effect on the harbor system's financial situation without adversely affecting safe operations.

The harbor system may encounter problems by deferring maintenance work, however. While this would achieve cost savings in the short term, it would create a backlog of maintenance work and could adversely affect the facilities' useful lives. The analysis has assumed a 40-year useful life of facilities, which should be achievable with good maintenance practices. If deferred maintenance reduced the life of facilities to 30 years, it would have a significant negative effect on the harbor system's financial situation and rates.

3.5.4 Rate Options

Two rate options considered in this study are implementation of a tiered rate structure for permanent moorage and separation of charges for services and facilities.

3.5.4.1 Implementing a Tiered Rate Structure

Adopting tiers with increasing rates for larger vessels provides the benefits of a more equitable sharing of facility costs and a better match between moorage revenues and the costs associated with constructing and maintaining facilities for vessels of different sizes.

Tiered rates for permanent moorage are an option and were considered in this analysis but are not included as a recommendation in this report because the Port and Harbor Commission recommended against this option.

3.5.4.2 Separation of Charges for Services and Facilities

Another rate-relation option for CBS's harbor system is to separate charges out for each service and facility provided. Charging for use of specialized facilities and other common-area improvements will allow for better cost allocation by matching the cost of providing those facilities and services to those

who use them. We recommend additional investigation into this option, with some candidates being the parking areas, tidal grid, and seaplane base. To do so will require additional data collection to analyze facility use.

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