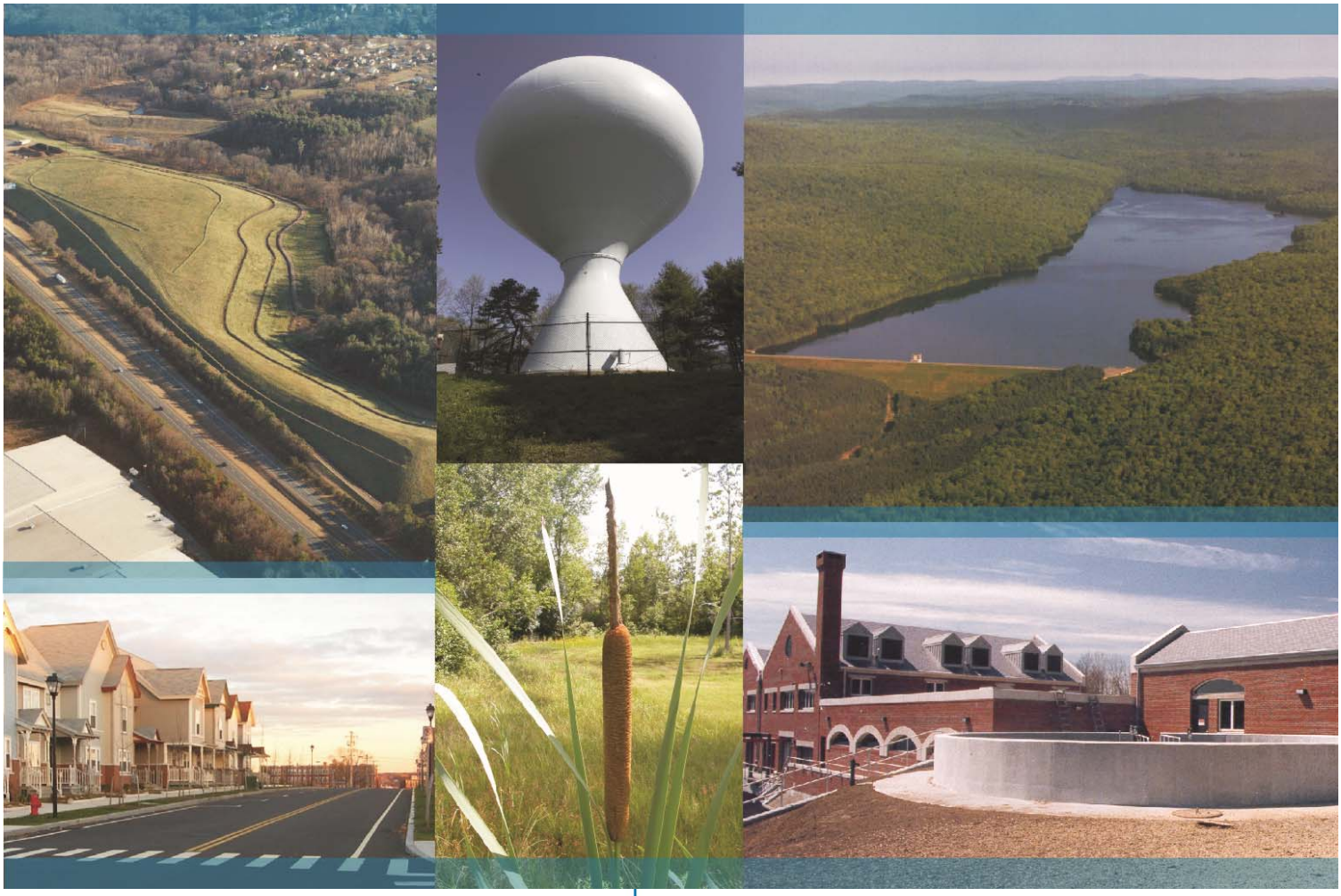

Tighe&Bond

DRAFT

Town Docks Inspection, Assessment & Asset Management Study

Prepared For:

Town of Wolfeboro
Wolfeboro, New Hampshire

September 14, 2017

Executive Summary

Tighe & Bond has investigated the Dockside Town Docks per the scope of work in our June 14, 2017 contract with Woodard & Curran and the Town of Wolfeboro, and additionally requested dock load capacity assessments. From our work we have found the facility has some deterioration and the finger docks and *Millie B* lower level dock have lower than normal pedestrian load capacity. Clear dock load limit postings for these lower capacity docks are recommended. The shoreline walls extending from the fire boat to the bridge have significant deterioration and stabilization with a stone revetment "living shoreline" approach can be cost effective while also reducing scour potential, ice damage and wave reflection.

Asset management recommendations are provided in Appendix A with a break-out of remaining service life for each dock element. Since each dock structural element has a different remaining service life, the actual repair approach may be controlled by the amount of dock needing disassembly and reconstruction. This is further complicated with the docks that have lower than normal pedestrian load capacity with a need for superstructure replacement based on live load capacity rather than deterioration and remaining service life.

The construction budget estimates for these conceptual repairs, including 20% contingency, but excluding permitting and engineering is:

1. Immediate repairs of cross bracing and 2 piles: $20,000
2. Near term replacement of superstructure: $300,000
3. Near term revetment construction: $120,000
4. Near term re-decking and cross bracing replacement on the Main Dock: $20,000

In accordance with the scope of work, no engineering assessment was made for mooring and berthing loads, including assessment of the adequacy of mooring bollards for the *Mount Washington*.

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Section 1
Introduction

1.1 Background

The Town of Wolfeboro owns and operates a town docking facility at Dockside just off South Main Street in downtown Wolfeboro. This facility has waterfront elements, including public recreational boat docks, commercial docks and associated shoreline seawalls.

1.2 Scope of Work

Tighe & Bond was contracted to provide an engineering study including swim-by observations and letter report summarizing the visually observed conditions of the existing town docks at Dockside

In addition Tighe & Bonds scope included visually assessing the condition of 7 timber finger docks, the associated shoreline dock seawall, the granite seawall and timber dock in the commercial docking area, and the seawall extending to the Main Street bridge.

Engineering assessments made are summarized in this letter report describing typical dock construction, typical conditions observed with example photographs, engineering assessments based on the observations, including anticipated remaining useful service life of the primary components, such as piles, pile caps, stringers and decking. The concrete and granite seawalls will be considered as single elements with the assessment more focused on deterioration/remaining service life and visible wall movement. Our seawall assessments and repair replacement budgets will be based on maintaining the existing appearance (such as granite blocks) and our experience budgeting for their repair or replacement. The intent of this study is to understand the existing conditions and outline an asset management plan to effectively budget for near term maintenance and a longer-term schedule and priority plan for more involved dock repairs, element replacements or full replacements, considering plans for dock lengthening.

After field observation from in the water, the light framing of the recreational docks was noted and checked, resulting in a scope of work amendment to evaluate representative dock pedestrian capacity.

Section 2
Investigations

Tighe & Bond staff inspected the facility with a three engineer dive team on August 15, 2017 completing visual assessments above and underwater. The lake level was at elevation 503.70' based on data posted by the NHDES Dam Bureau.

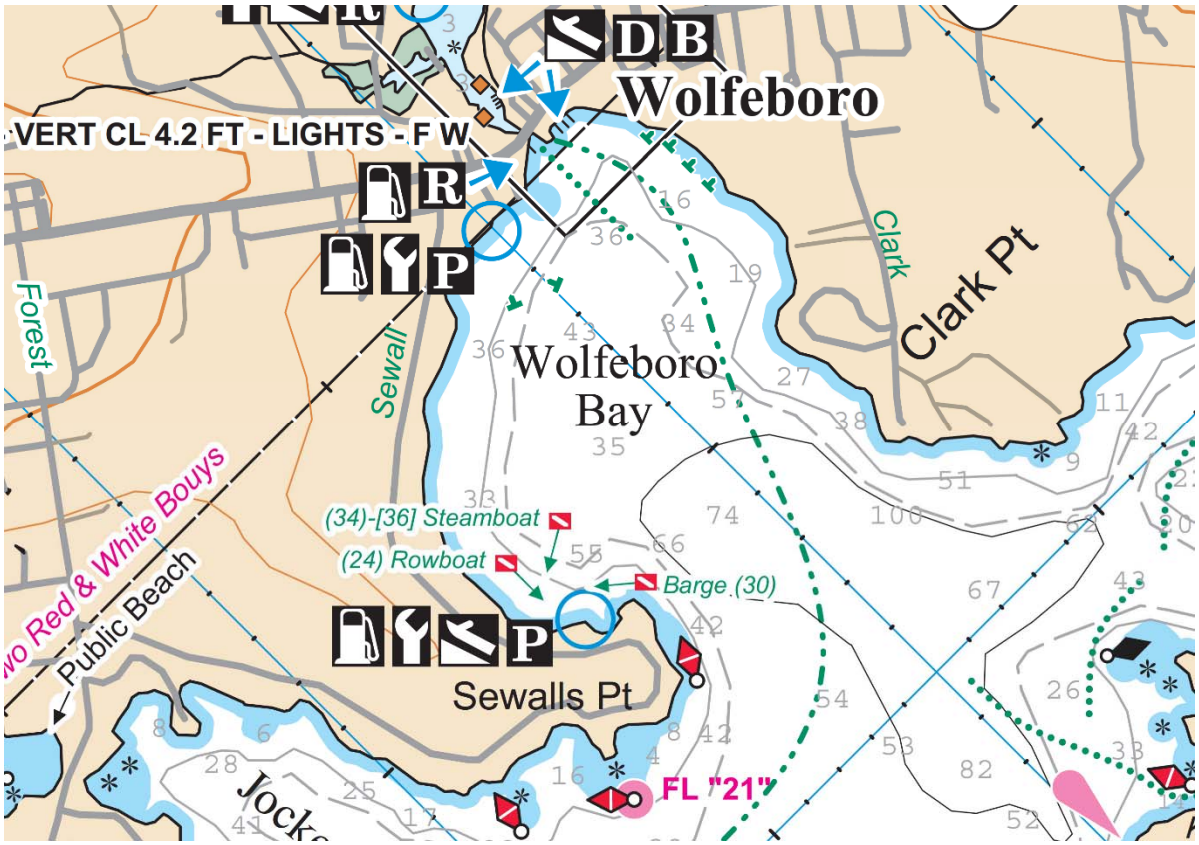

Figure 1 Vicinity Map

Below is a summary of the observations made at each of the structures.

2.1 Recreational Boat Finger Docks

These 8 foot wide docks share generally similar timber construction with 2"x8" decking, 4"x8" rangers (deck edge stringers), 2"x8" interior stringers (approximately 2 feet apart), 8"x8" pile caps and pairs of timber piles about 6 feet apart with pile bents 10 feet oc center average. Based on observations at displaced piles, there appear to be 3/8" diameter drift pins (landscape spikes) driven through the pile caps and into the pile tops. The piles also typically have 1/8" thick x 3" wide plain steel straps fastened to each pile and the pile cap above. Some of these steel straps have been bent with a few pile heads displaced, perhaps by ice movement. Cross bracing on the docks was primarily under water and did vary from 2x timber bracing to stainless steel cables with steel turnbuckles. Much of the cross bracing is deteriorated or failed with split or broken timbers or corroded turnbuckles.

The boat fender rub strips are timber, consisting of vertical 4”x6” timbers 7 feet on center both sides, typically extending to the lake bed. The timber rub strips form the wearing surface for moored boats and are also used for tie-up. There are varying degrees of wear on the rub strips, typically at about deck level, with some worn to the point where the previously counter sunk bolt ends are now protruding. A few of the rub strips in deeper water were not sufficiently long to reach the lake bed, and apparent steel sign posts are fastened to the bottom to extend down to the lake bed. A few of these steel posts are failed. It was apparent that these timber rub strips are selectively being replaced as routine maintenance. We noted that most boats secure their mooring lines to these rub strips about 18 inches above deck level.

Dock D had slightly different deck framing with all of the stringers of 4”x8” timber size.

Dock G is utilized by the fire boat and US Mail boat. It has the typical finger dock construction, but has boat docking on only one side.

Dock length did vary, with the following measurements:

Dock A 120.5’ long
Dock B 140.7’ long
Dock C 141.0’ long
Dock D 141.2’ long
Dock E 133.3’ long
Dock F 90.1’ long
Dock G 88.2’ long
Shoreline Connector Dock 120’ long

More detailed notes on dock observations are included in Appendix A.

Photo 1 Typical finger dock construction

Photo 2 Heartwood decay in pile cap, Dock C, bent 4 east end, note left ranger with minimal bearing on the pile cap

Photo 3 Typical weathered decking

2.2 Main Commercial Dock

The Main Docks appears to be used primarily for commercial uses including overnight docking of the *Millie B* and visiting docking of the *Winnipesaukee Belle* and *Mount Washington*. The Main Dock is timber construction with 2x8 decking, 4x12 stringers (approximately 2 feet apart), 12x12 pile caps and pairs of timber pile bents about 10 feet apart. The piles typically have 1/8" thick x 3" wide plain steel straps fastened to each pile and the pile cap above. Some of these steel straps have been bent with a few pile heads displaced, perhaps by ice movement. Cross bracing on the docks was primarily under water and was 2x timber bracing. Much of the cross bracing is deteriorated or failed with mostly split or broken timbers. The bollard located on the timber dock consisted of a length of steel pipe over a vertical oak timber pile with above water decay, plus one decayed oak batter pile and three pressure treated pine piles, two of which had loose connection bolts. The pipe bollard did appear to move sideways when under load during *Mt Washington* docking.

There is a lower level cantilevered deck used for boarding onto the *Millie B*. These cantilevered pile caps are fastened with single 3/4" diameter threaded rod, reducing this deck capacity. – See load rating summary in Section 3.2.

The western dolphin used by the bow of the *Mt Washington*, has approximately 18 piles of different ages and different types of timber. Two oak piles are broken, one pressure treated timber pile is broken, 5 brown (creosote treated?) piles have damaged near the top, and there are 5 cut off timber pile stubs underwater protruding from the lake bed.

Dolphin A consists of 2 pressure treated timber piles and three older pile stubs cut off at the water line. The threaded rod connecting the two piles is bent indicating prior overload or insufficient lateral capacity.

Dolphin B consists of 2 pressure treated timber piles and three older pile stubs cut off at the water line.

Dolphin C consists of 3 pressure treated timber piles and three older pile stubs cut off at the water line.

Dolphin D consists of 2 pressure treated timber piles and one older pile stub cut off at the water line.

The South Dolphin is a primary berthing dolphin for the Mt Washington, comprised of 17 pressure treated pine piles, plus one older oak pile stub, with 6 pressure treated pine piles apparently added to the northeast side as the original 17 piles lean to the northeast (reportedly due to ice forces). Three piles in this dolphin are broken just above the lake bed. It was noted that the underwater power cable running to this dolphin is exposed on the lake bed near the dolphin, in an area clearly scoured by propeller wash with active sediment movement.

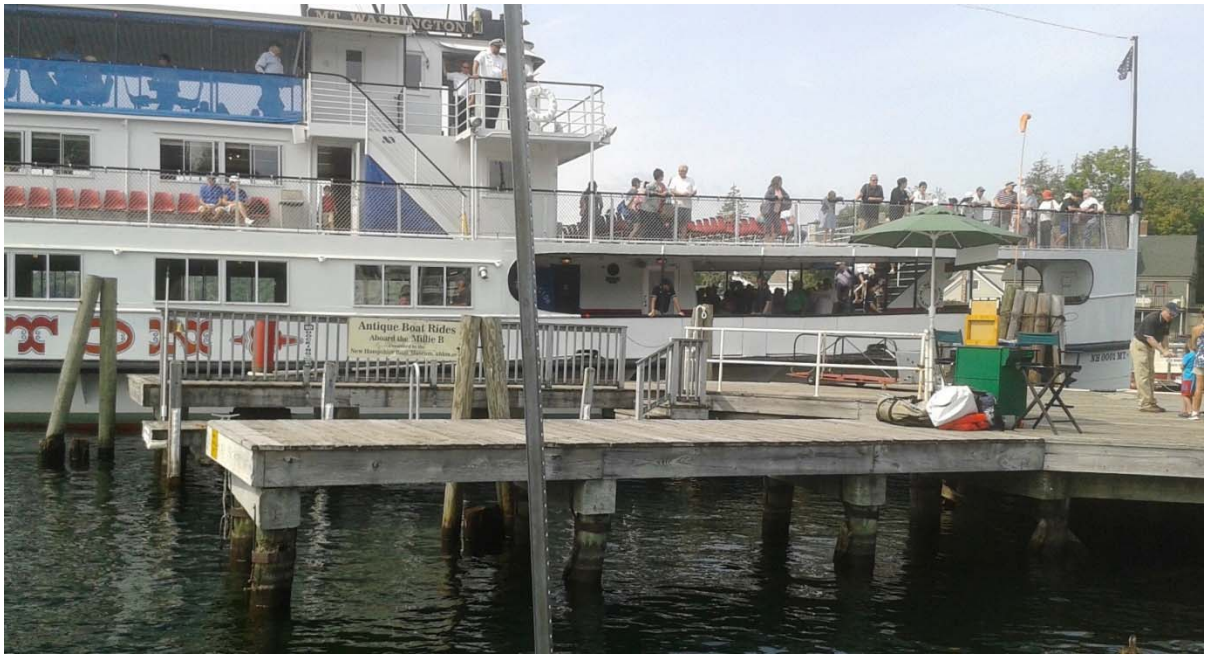

Photo 4 Main Dock

Photo 5 Cantilevered lower deck for *Millie B*

Photo 6 Laterally displaced pile head, left pile cap with minimal bearing

Photo 7 Broken cross bracing underwater

Photo 8 West Dolphin, note broken piles

Photo 9 South Dolphin, main cluster of piles leaning to left

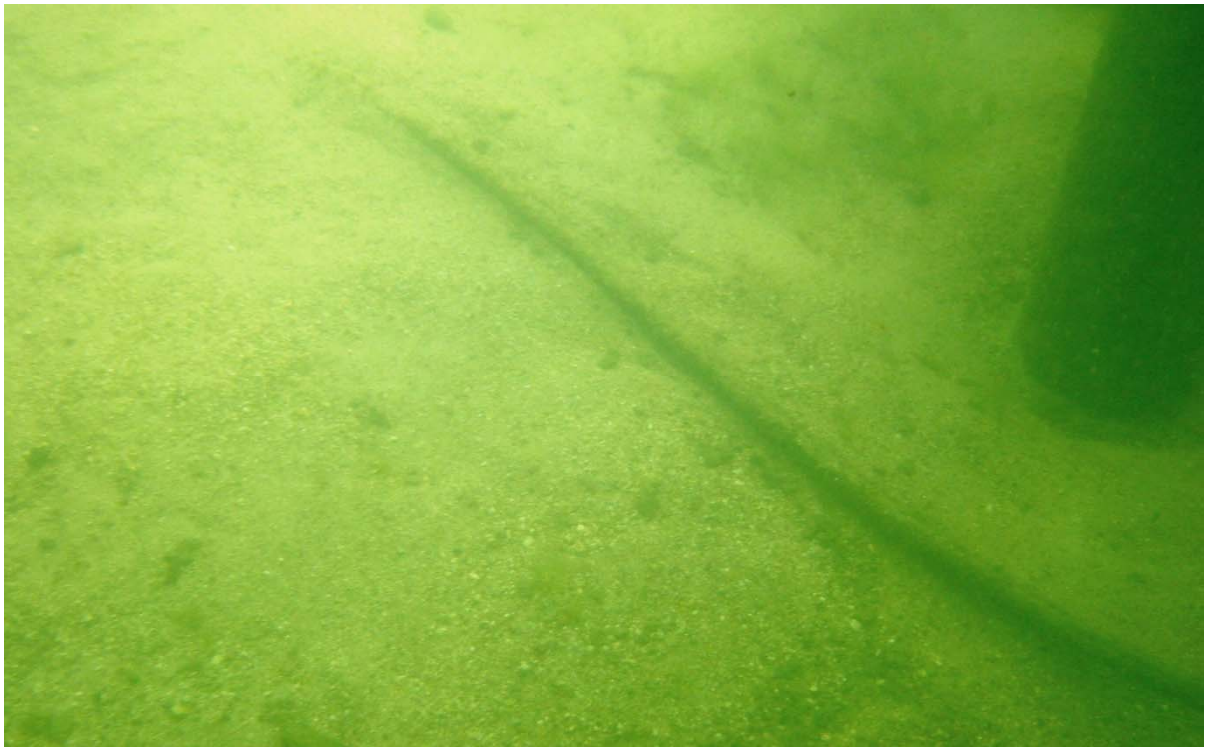

Photo 10 Exposed power cable on the lake bed (prop wash sand ridge) adjacent to South Dolphin

2.3 East Seawall

The east seawall is a low concrete shoreline retaining wall in shallow water. The concrete does have some cracking, spalling and surface scaling due to weathering and freeze-thaw winter weather. The most severe surface scaling is just underwater in a zone that would be exposed to freezing during lower lake levels, where the concrete is water saturated following summer submergence. At the corners where spalling has exposed the internal wall concrete, we noted no sign of reinforcing bars and the use of cobbles and boulders within the concrete, suggesting this may be an older wall. The return wall across the eastern end of the paver walkway has minimal depth and wave action has created a scour void, which is starting to collapse the brick pavers.

Photo 11 Scour void under return wall

Photo 12 East Seawall deteriorated eastern corner

2.4 Center Seawall

The center seawall runs from the boat ramp westward to the mail boat dock. The concrete does have some cracking, spalling and surface scaling due to weathering and freeze-thaw winter weather. The most severe surface scaling is just underwater in a zone that would be exposed to freezing during lower lake levels, where the concrete is water saturated following summer submergence. We were told that the plastic lumber bench above, actually contains the upper portion of deteriorated concrete wall, however we could not confirm this.

2.5 Mail Dock Seawall

The mail boat dock is a relatively short length of sawn timber wall of unknown configuration. There were no visible indicators of tie-backs. This wall appeared to be of relatively recent construction in good condition. Some slight settlement of the near edge brick pavers may indicate some minor loss of paver bedding sand, or slight wall movement.

2.6 Main Dock Seawall

The Main Dock seawall was a surprise when viewed underwater as it is primarily a horizontal sawn timber wall with granite blocks on top, above water level. The underwater timbers do appear to be old having some area, particularly at butt joints and the corner, having some biological deterioration (loss of wood) resulting in wall voids. There are many large cast iron brackets along the south face of this wall, founded on timber pile stubs and bolted to the horizontal timbers, that extend upward to help support the granite wall blocks above. There are several granite blocks along the southern face and the western face that appear to be moving. Along the southern face (station 2+12 to 2+93), the upper-most granite does not appear to have moved, indicating it may be dowel connected to the concrete pavement above (concrete extends over the granite). Along the western face the granite blocks extend up to deck level and a gap between the concrete and the granite, up to an inch wide, indicates the granite blocks are moving offshore. Underwater observation noted a substantial void between timbers at the southwestern corner and some locations with prior grout bag repairs.

Photo 13 South wall face with rotated granite blocks with cast iron bracket visible underwater

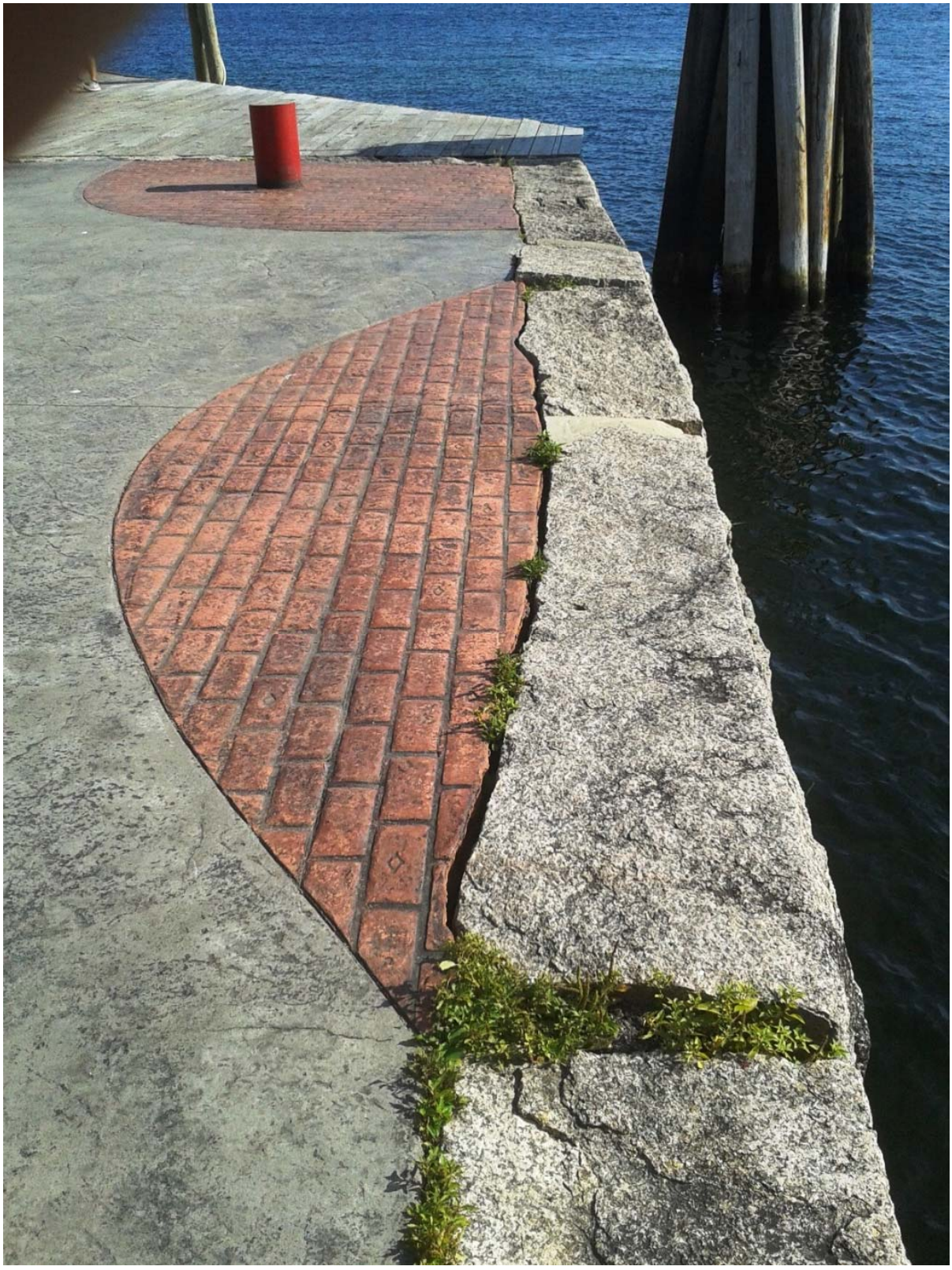

Photo 14 Western face of seawall, note opened gap between the granite blocks and cast in place concrete slab

2.7 Log Cribs Seawall

The wall along the river from station 4+01 to 5+18 is comprised of rock filled log cribbing, with a covering a sawn timber facing/fendering above water level. This length of wall does have indications of scour damage and log deterioration above and underwater. There are many large grout bags around station 4+50 that appear to be a prior repair of channel scour along the wall. A loose log end was found at station 4+25 indicating a broken or deteriorated log. A log end at station 4+56 contained decay at about 1.5 feet below the sidewalk. At station 5+16, log ends just below the concrete pavement level have settled about 2 inches from when the pavement concrete was placed. The inshore extent of the log cribs is not known and may be of concern if they extend under and support the adjacent building.

Photo 15 Log crib wall with timber plank covering

Photo 16 Log ends settled relative to concrete pavement above

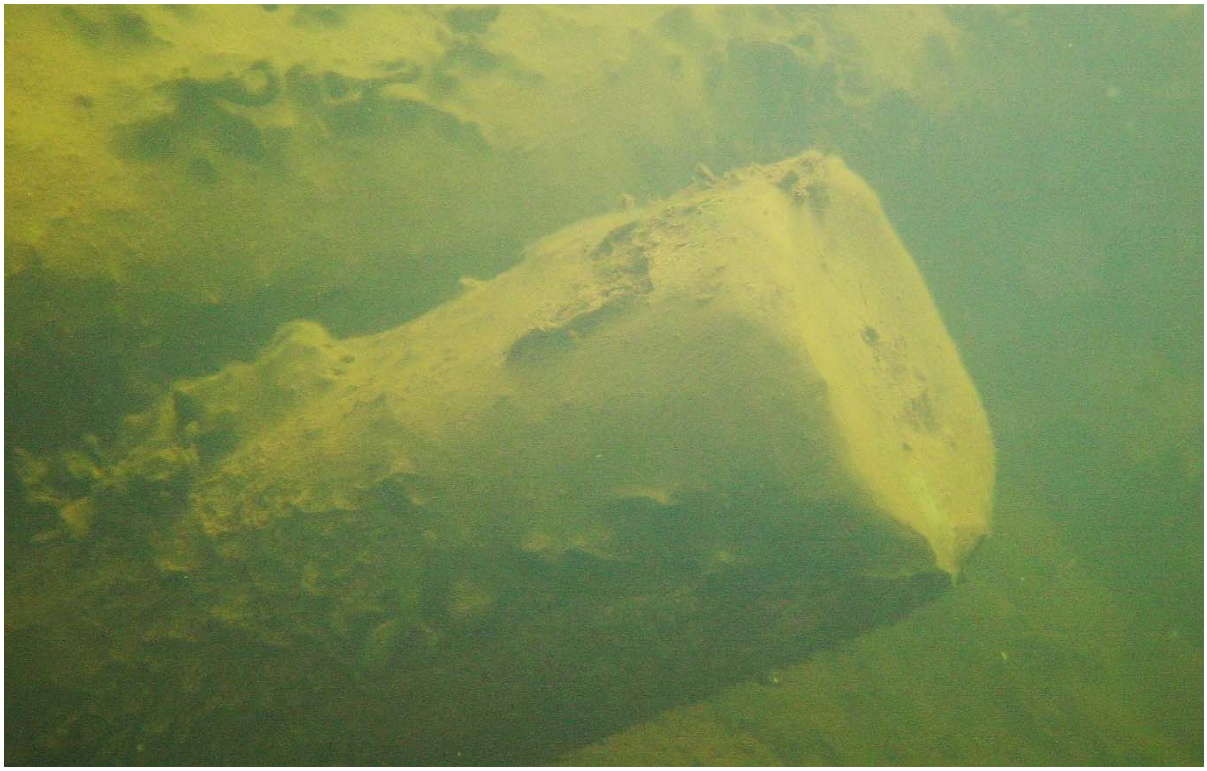

Photo 17 Crib log end angled upward, suggesting scour induced subsidence or a broken log

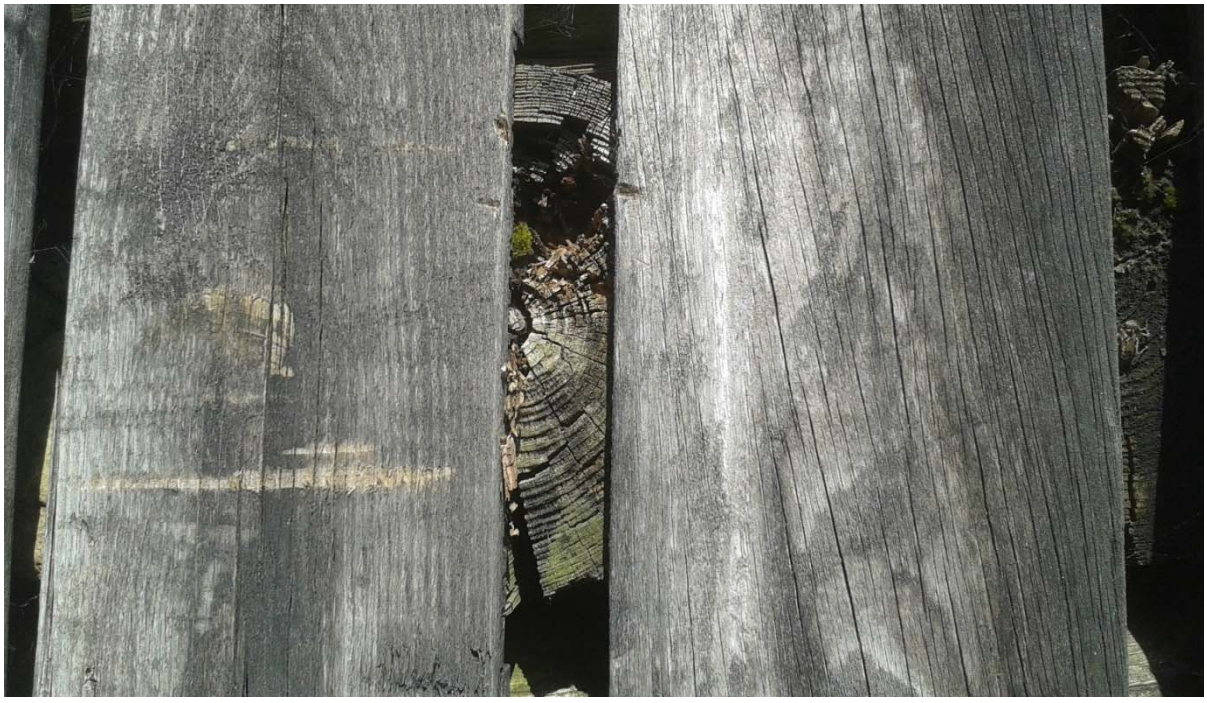

Photo 18 Log end decay visible between planks

Section 3
Repair and Replacement Recommendations

After investigation of the docks and seawalls, we established four priority levels to the needed repairs: Immediate (this winter or sooner), A (1-3 years), B (5-10 years) and None (25 years or more). Immediate repairs include posting load limits for the finger docks with a maximum pedestrian capacity, pushing two damaged piles back into place, and replacing the cross-bracing at the ends of the finger docks (deepest water highest priority). "A" level repairs include the replacement of the decking on all the docks, the construction of stone revetment slopes in front of the log crib seawall and the main dock seawall, and the installation of grout bags to fill the voids in the timber cribs. "B" level repairs include replacing the stringers and pile caps on the finger docks and replacing the center and east seawalls. Items that fall in the "None" category are the piles and the timber bulkhead at the mail dock seawall.

3.1 Recreational Boat Finger Docks

Load rating calculations for the recreational docks show that the existing superstructure framing is undersized. Each dock is rated for a uniform live load (pedestrian) of 34 psf which equates to 15 people for the 10' x 8' contributory area for each pile bent. On dock D, which was built with 4"x8" stringers instead of 2"x8" stringers, the maximum uniform live load is 40psf. These dock pedestrian load limits are well below the 100 psf suggested for public docking structures and as such, the docks should be clearly load limit posted for a reduced capacity until the docks can be rebuilt with the superstructure to meet the full 100 psf live load normally recommended for public spaces.

Repairs to the recreational docks should occur in two steps. On a priority basis, the missing cross-bracing should be replaced as soon as possible for the two outermost pile bents on each dock. The two end pile bents have the longest piles and will benefit the most from cross-bracing. At the same time, the pile at the end of Dock A should be pushed back into place and the pile cap should be secured back onto the pile.

Later when funding is secured, the entire dock superstructure should be redesigned to meet the 100 psf live load requirement and rebuilt accordingly. If the docks are posted with a reduced live load capacity, this can be put off for up to 5 years while plans, permits and funding are secured. During the superstructure replacement, the 4"x6" fenders should also be replaced as needed when they fail or reach the end of remaining service life.

The piles are in good condition and can be left in place when the superstructure is replaced. We anticipate 25 years of remaining service life for the piles.

3.2 Main Commercial Dock

The main commercial dock, being of heavier construction, meets the full 100 psf live load requirement. We recommend immediate replacement of the broken cross-bracing and the replacement of the decking since there is advanced weathering and some surface decay. Additionally, there is a pile on the east side of the dock that should be pushed back into place. We anticipate a remaining service life of 10 years, due to the stringers and pile caps. Like the finger docks, the piles are in good condition and we expect a remaining service life of 25 years for the piles.

The 4' wide cantilevered dock that services the *Millie B* is the only exception. This dock is lower than the main dock and is cantilevered on (4) 2"x12"s sistered together. The 2x12s are fastened to the main piles by ¾" bolts, one on each pile. Based on calculations, this results in a uniform live load capacity of 19 psf, or 10 people total. We recommend this be clearly load limit posted immediately and that the cantilevers be strengthened, or additional piles are added to eliminate the cantilever.

Photo 19 Cantilevered deck

The Main Dock dolphins will be subjected period vessel impact and potentially ice damage, thus have a lower projected remaining service life, in comparison to dock piles. It is recommended that the underwater power cable running to the South Dolphin be secured to the piles down to the lake bed and either be buried or covered with ballast mats where exposed.

3.3 East Seawall

It appears this cast in place concrete seawall is approaching the end of its service life so we recommend a full replacement of this wall. We anticipate a remaining service life of 5-10 years, during which the wall can be designed and permitted and funding can be secured.

3.4 Center Seawall

Like the east seawall, this cast in place concrete wall is nearing the end of its service life and should be fully replaced within the next 5-10 years.

3.5 Mail Dock Seawall

This timber bulkhead is in good condition and we expect a remaining service life of 25 years. There is already a small revetment at the toe of the bulkhead with stones up to

18". We recommend filling in any gaps in this revetment to shore up the wall and ensure it lasts for the 25 year service life.

3.6 Main Dock Seawall

The granite blocks that sit on top of the timber wall are generally moving towards the water as the underwater timber and its fasteners deteriorate. To prevent further displacement of the blocks, we recommend constructing a stone revetment in front to shore up the wall. To facilitate environmental permitting of this "fill", it is suggested that the aquatic habitat and reduction in wave reflection values be emphasized, including discussion of this forming a "living shoreline". The revetment would consist of large angular interlocking stones set at a 1.5H:1V slope and the top of the slope would remain near summer lake level to maintain the character of the existing wall. Granite block chinking and cramp irons (rock staples) are recommended to tie the granite blocks together and keep the granite block portion of wall stable.

At the corner of the seawall on the western end of the wall, the timber wall below water have deteriorated away and opened a large void under the granite blocks. This and other voids should be filled with grout bags (prior to revetment placement) to prevent further settlement of the granite blocks above.

With the repairs described above, this section of wall can have a remaining service life exceeding 25 years.

3.7 Log Cribs Seawall

Fixing this section of wall is similar to the repairs described under Section 3.6 to the extent a stone slope can be used without restricting the navigation channel and not control river cross section. We recommend constructing an underwater revetment slope to stabilize the wall and prevent further scour and to stabilize the crib wall. This conceptual repair may need to incorporate an above water vertical wall where there are geometric or flow constraints which have not been included in these preliminary construction budget estimates. Prior to setting the revetment, we recommend filling the void with grout bags or stone. As this conceptual repair would not address existing voids under the adjacent building, it may need additional repairs such as void grouting or underpinning.

If the wall is repaired, we anticipate a remaining service life greater than 25 years.

Facility	System	System Abvr.	Item No.	AssetID	Asset Type	Element	Asset / Defect Description	Proposed Improvement	Recommended Action Category [1]	Remaining Service Life (yrs)	Likelihood of Failure	LoF (Num)
Dock General Improvements												
Dock A	Recreational public docking	D	A	DA	Timber dock		8 ft wide timber dock					
						Piles	Driven timber piles	None		25	Low	1
						Bracing	timber or cable cross bracing	Replace with 3x8	Immediate	1	Very High	4
						Pile Caps	8x8 timber pile caps	Replace with 10x10	B	5	Medium	2
						Stringers	2x8 internal stringers & 4x8 side stringers	Replace with 3x10, 16" O.C.	B	5	Medium	2
						Decking	2x8 timber decking	Replace in kind	A	2	High	3
						Fenders	4x6 vertical timber rub strips	Replace in kind	A	3	High	3
Dock B	Recreational public docking	D	B	DB	Timber dock		8 ft wide timber dock					
						Piles	Driven timber piles	None		25	Low	1
						Bracing	timber or cable cross bracing	Replace with 3x8	Immediate	1	Very High	4
						Pile Caps	8x8 timber pile caps	Replace with 10x10	B	5	Medium	2
						Stringers	2x8 internal stringers & 4x8 side stringers	Replace with 3x10, 16" O.C.	B	5	Medium	2
						Decking	2x8 timber decking	Replace in kind	A	2	High	3
						Fenders	4x6 vertical timber rub strips	Replace in kind	A	3	High	3
Dock C	Recreational public docking	D	C	DC	Timber dock		8 ft wide timber dock					
						Piles	Driven timber piles	None		25	Low	1
						Bracing	timber or cable cross bracing	Replace with 3x8	Immediate	1	Very High	4
						Pile Caps	8x8 timber pile caps	Replace with 10x10	B	5	Medium	2
						Stringers	2x8 internal stringers & 4x8 side stringers	Replace with 3x10, 16" O.C.	B	5	Medium	2
						Decking	2x8 timber decking	Replace in kind	A	2	High	3
						Fenders	4x6 vertical timber rub strips	Replace in kind	A	3	High	3
Dock D	Recreational public docking	D	D	DD	Timber dock		8 ft wide timber dock					
						Piles	Driven timber piles	None		25	Low	1
						Bracing	timber or cable cross bracing	Replace with 3x8	Immediate	1	Very High	4
						Pile Caps	8x8 timber pile caps	Replace with 10x10	B	5	Medium	2
						Stringers	4x8 stringers	Replace with 3x10, 16" O.C.	B	5	Medium	2
						Decking	2x8 timber decking	Replace in kind	A	2	High	3
						Fenders	4x6 vertical timber rub strips	Replace in kind	A	3	High	3
Dock E	Recreational public docking	D	E	DE	Timber dock		8 ft wide timber dock					
						Piles	Driven timber piles	None		25	Low	1
						Bracing	timber or cable cross bracing	Replace with 3x8	Immediate	1	Very High	4
						Pile Caps	8x8 timber pile caps	Replace with 10x10	B	5	Medium	2
						Stringers	2x8 internal stringers & 4x8 side stringers	Replace with 3x10, 16" O.C.	B	5	Medium	2
						Decking	2x8 timber decking	Replace in kind	A	2	High	3
						Fenders	4x6 vertical timber rub strips	Replace in kind	A	3	High	3
Dock F	Recreational public docking	D	F	DF	Timber dock		8 ft wide timber dock					
						Piles	Driven timber piles	None		25	Low	1
						Bracing	timber or cable cross bracing	Replace with 3x8	Immediate	1	Very High	4
						Pile Caps	8x8 timber pile caps	Replace with 10x10	B	5	Medium	2
						Stringers	2x8 internal stringers & 4x8 side stringers	Replace with 3x10, 16" O.C.	B	5	Medium	2
						Decking	2x8 timber decking	Replace in kind	A	2	High	3
						Fenders	4x6 vertical timber rub strips	Replace in kind	A	3	High	3

Facility	System	System Abvr.	Item No.	AssetID	Asset Type	Element	Asset / Defect Description	Proposed Improvement	Recommended Action Category [1]	Remaining Service Life (yrs)	Likelihood of Failure	LoF (Num)
Dock General Improvements												
Dock G	Recreational public docking	D	G	DG	Timber dock		8 ft wide timber dock					
						Piles	Driven timber piles	None		25	Low	1
						Bracing	timber or cable cross bracing	Replace with 3x8	Immediate	1	Very High	4
						Pile Caps	8x8 timber pile caps	Replace with 10x10	B	5	Medium	2
						Stringers	2x8 internal stringers & 4x8 side stringers	Replace with 3x10, 16" O.C.	B	5	Medium	2
						Decking	2x8 timber decking	Replace in kind	A	2	High	3
						Fenders	4x6 vertical timber rub strips	Replace in kind	A	3	High	3
Dock H	Recreational public docking	D	H	DH	Timber dock		6 ft wide timber dock					
						Piles	Driven timber piles	None		25	Low	1
						Bracing	timber or cable cross bracing	Replace with 3x8	Immediate	1	Very High	4
						Pile Caps	8x8 timber pile caps	Replace with 10x10	B	5	Medium	2
						Stringers	2x8 internal stringers & 4x8 side stringers	Replace with 3x10, 16" O.C.	B	5	Medium	2
						Decking	2x8 timber decking	Replace in kind	A	2	High	3
						Fenders	4x6 vertical timber rub strips	Replace in kind	A	3	High	3
Main Commercial Dock	Recreational public docking	D	I	DI	Timber dock		U shaped dock, width varies					
						Piles	Driven timber piles	None		25	Low	1
						Bracing	timber or cable cross bracing	Replace with 3x8	Immediate	1	Very High	4
						Pile Caps	12x12 timber pile caps	None	B	5	Medium	2
						Stringers	4x12 stringers	None	B	5	Medium	2
						Decking	2x8 timber decking	Replace in kind	A	2	High	3
						Fenders	Driven timber piles	Replace broken dolphin piles	B	10	Medium	2
Log Cribs Seawall	Retaining Wal	W	A	WA	Retaining Wall		Timber crib retaining wall					
						Above Water Timber Cribs	12" logs covered with sawn lumber	None	B	5	Medium	2
						Under Water Timber Cribs	12" logs	Install revetment slope under water line	A	2	High	3
						Toe of Wall	Sandy bottom with intermittent boulders	Install revetment slope under water line	A	2	High	3
Main Dock Seawall	Retaining Wall	W	B	WB	Retaining Wall		Granite block on horizontal timber wall					
						Granite Blocks	3 rows, 2' high	Install steel retaining straps as needed	A	2	High	3
						Horizontal Timbers	~8" timber	Install grout bags in voids created by rot	Immediate	1	Very High	4
						Cast Iron Brackets	Cast iron brackets on timber piles below water line	None			Low	1
						Toe of Wall	Sandy bottom with boulders	Install revetment slope under water line	A	2	High	3
Mail Dock Seawall	Retaining Wall	W	C	WC	Retaining Wall		Timber bulkhead					
						Timber Bulkhead	~8" timbers	None		25	Low	1
						Tow of Wall	Up to 18" stone	Install revetment stone to fill in gaps		25	Low	1
Center Seawall	Retaining Wall	W	D	WD	Retaining Wall		Cast-in-place concrete wall					
						Concrete Wall	Concrete with slight batter on face	Replace with new concrete wall	B	10	Medium	2
						Toe of Wall	Sandy bottom with small boulders	None			Low	1
East Seawall	Retaining Wall	W	D	WD	Retaining Wall		Cast-in-place concrete wall					
						Concrete Wall	Concrete with slight batter on face	Replace with new concrete wall	B	10	Medium	2
						Toe of Wall	Sandy bottom with small boulders	None			Low	1

APPROXIMATE

5+18
LOG CRIBS WALL
4+01
GRANITE OVER TIMBER WALL
3+40
1+40
CENTER SEAWALL
1.2'
0+00
1+84
0+12.5
1+71.5
4.0'
SAWN TIMBER WALL
3.9'
EAST SEAWALL
2.0'
2.0'
2.2'
0+00
0+14.5
1.8'
WEST DOLPHIN
3+04
GRANITE OVER TIMBER WALL
MAIN DOCK
2+12
DOLPHIN A
DOCK G
7.7'
DOLPHIN B
DOCK F
14.1'
DOLPHIN D
DOLPHIN C
SOUTH DOLPHIN
16.0'
DOCK E
16.1'
DOCK D
11.1'
DOCK C
10.5'
DOCK B
10.5'
DOCK A
10.2'

REFERENCE: GOOGLE EARTH PROFESSIONAL

SITE PLAN

NOTES:
1. SCALE IS APPROXIMATE
2. STATIONING IN FEET
3. DEPTHS IN FEET FROM WL= EL. 503.7' (NHDES)

20 0 20 40 60
(FEET)

SITE PLAN

Tighe&Bond
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TOWN DOCKS AT DOCKSIDE

WOLFEBORO, NEW HAMPSHIRE

LAKE WINNIPESAUKEE

TOWN OF WOLFEBORO

SEPT 14, 2017

FIGURE 2