City and Borough of Wrangell
Port Commission
AGENDA

Thursday, April 03, 2025
6:00 PM

Location: Borough Assembly Chambers
City Hall

1. **CALL TO ORDER**
2. **ROLL CALL**
3. **APPROVAL OF MINUTES** *(MOTION - Move to approve the Minutes, as presented)*
    a. 3/6/25 Port Commission Minutes
4. **AMENDMENTS TO THE AGENDA**
5. **CORRESPONDENCE**
6. **PERSONS TO BE HEARD**
7. **HARBORMASTER'S REPORT**
    a. Harbormaster Report April 2025
8. **COMMISSIONER REPORTS**
9. **UNFINISHED BUSINESS**
10. **NEW BUSINESS**
    a. Approval of Sublease for Marine Service Center Lot #4 from Steve Keller dba Keller Marine to Jared Gross dba JG Marine
    b. Barge Ramp Condition Assessment
    c. 2011 Barge Ramp Condition Assessment
11. **NEXT AGENDA ITEMS**
12. **ADJOURN**

Minutes of the Regular Wrangell Port Commission Meeting
Held March 6, 2025

Chairman John Yeager called the Regular Port Commission meeting to order at 6:01 p.m. on March 6, 2025.

PRESENT: Commissioners Buness, Yeager, Yancey, and Silva
Harbormaster Steve Miller was also in attendance.

APPROVAL OF MINUTES

a. Approval of minutes from meeting held on February 6, 2024.

M/S: Buness/Yancey to approve the minutes as presented. Motion approved unanimously.

AMENDMENTS TO THE AGENDA – none.

CORRESPONDENCE/PERSONS TO BE HEARD – none.

HARBORMASTER'S REPORT

- PND Engineers inspected the barge ramp, they should have a new rating to us by mid-March.
- Meyers Chuck float plans were sent back for another draft, recalculating for floatation.
- Harbor Crew refloated all finger ends at Reliance, filled potholes in harbor parking lots and streets, began decommissioning the old net float.
- Hoist repairs are nearly complete.
- Administrative Assistant attended the AAHPA Admin Conference in Juneau.
- Harbormaster Miller is currently developing a 52 week safety meeting program for the harbor crew.

COMMISSIONER REPORTS

- Buness – none.
- Davies – absent.
- Yeager – Welcomed Silva to the Commission.
- Yancey – Commented that the harbor crew has been busy and doing a good job.
- Silva – Inquired about hoist repairs.

UNFINISHED BUSINESS – none.

NEW BUSINESS –

10a. GPIP Haul Out Development Information

- Commissioners reviewed the information provided. Yeager mentioned this is a good discussion item for the future as projects develop.

NEXT AGENDA ITEMS: - TBD

The next Regular meeting will be held on 4/3/25.

The Regular Port Commission meeting was adjourned at 6:46 p.m.

_____

CITY & BOROUGH OF Wrangell PORTS & HARBORS

MEMORANDUM

TO:	**HONORABLE MAYOR AND MEMBERS OF THE ASSEMBLY AND PORT COMMISSION OF CITY AND BOROUGH OF WRANGELL**
CC:	**MASON VILLARMA, BOROUGH MANAGER**
FROM:	**STEVE MILLER, PORT DIRECTOR**
SUBJECT:	**MONTHLY PORT & HARBOR REPORT**
DATE:	**03/03/2025**

Harbor Maintenance

The Harbor Maintenance team has been actively working on a variety of ongoing projects. A new ladder has been installed at the south Reliance crane, and a portion of the bull rail has been replaced. Additional bull rail replacements will continue as time and weather permit.

At the Old Mill Dock, several pilings require reattachment. The crew has been addressing these repairs during short windows of high tide, which allow access to the connection points beneath the pier. This work is expected to be completed within the next couple of tides.

The crane located at the Marine Service Center has successfully undergone a full overhaul and is now back in service. The primary scope of work included the removal and rebuilding of the main swivel unit located within the crane's base. This component was sent to Seattle for professional refurbishment and has since been reinstalled. In addition to the swivel unit, all hydraulic hoses and valve handles were replaced to ensure safe and efficient operation. The maintenance team completed all testing and inspections, and the crane is now fully operational and ready for use.

Demolition of the old net dock is also nearing completion. The crew has been dismantling the float structure one truckload at a time during low tide, which is the only feasible time to bring a vehicle onto the beach. All decking has been removed and disposed. The next phase involves disassembling the underlying log float structure.

As temperatures begin to rise, crews will be out pressure washing floats to remove green growth that accumulates on the surface. This task is highly time-consuming due to the extensive system of docks, which totals nearly five miles of floating walkways. Each bull rail has four sides, making the pressure washing process especially labor intensive.

Figure 1 Net Float

Figure 2 Net Float Decommission

Figure 3 Reliance Bull Rail and Ladder

Figure 4 Mill Dock Crane

Marine Service Center

Activity at the Marine Service Center is ramping up as haul-out requests continue to increase. The office is currently receiving a minimum of five inquiries per day and is actively scheduling haul-outs as the necessary paperwork is completed. At this time, both April and May are fully booked.

In addition to haul-out operations, the crew has been focused on other important tasks. Most recently, they completed a full cleanup of the front section of the Old Mill Dock to ensure a safe and organized workspace in preparation for upcoming barge operations.

Port

Following a recent structural assessment conducted by PND Engineers, significant safety concerns were identified regarding the condition of the City's barge ramp. Based on the findings of the report, the City Manager made the decision to officially decommission the barge ramp effective Friday, March 21, 2025.

This determination follows a previous assessment completed in 2011, which outlined specific weight limitations for equipment and cargo crossing the ramp. Over time, these limits have been exceeded, resulting in substantial structural changes. Notably, the ramp has shifted from a +3" camber to a -1" deflection due to repeated overloading by heavy equipment.

In response to the closure, barge operations have been redirected to the Marine Service Center (MSC). Port staff acted swiftly to prepare the MSC for this transition, including clearing space, reattaching piling when tides permit and initiating rock work to support the increased van and equipment traffic. Additional efforts are ongoing to enhance the area and ensure it remains safe and functional for all users.

As the MSC approaches peak seasonal use—particularly with the anticipated arrival of fish vans—this area is expected to become highly congested. Effective coordination and communication between the barge lines and the Port will be critical to managing traffic flow and maintaining safe, efficient operations in the limited space available.

Figure 5 Mill dock Clean up

Figure 6 Mill dock Piling reattachment

In summary, the Harbor Department has remained highly productive across multiple operational fronts, with notable progress in maintenance, infrastructure upgrades, and preparation for a busy spring and summer season. From structural repairs at the Old Mill Dock and ongoing float maintenance, to the completion of the Mill Dock crane overhaul and enhanced coordination for barge operations, staff efforts reflect a proactive approach to both immediate needs and long-term planning. The recent decommissioning of the barge ramp has accelerated the transition of cargo activity to the Marine Service Center, prompting rapid adaptations to support increased traffic. With dock pressure washing underway, critical safety upgrades completed, and a fully booked schedule through May, the department is well-positioned to support Wrangell's marine industries while maintaining a safe, clean, and efficient working environment for all users.

Sincerely,
Steve Miller
Port Director

February 18, 2025

Dear Mayor, Members of the Assembly, and Port Commission,

I am writing this letter regarding my lease space at the Wrangell Marine Service Center Lot#4. I have owned this lease since February of 2011, and have just retired and sold my business to Jared Gross DBA JG Marine.

I prepaid this year's lease because we are selling and carrying the sale contract. Having the lease is security for us and we didn't realize that we could not rent to Jared while he purchased the business.

The new lease will be continuing to use the space for fiberglass and aluminum boat repair and fabrication.

Jared has worked with me for several years doing fiberglass and fabricating aluminum parts for the boats including masts, booms, top houses, trolling and stabilizer poles.

Our contract with Jared is for four years. It would be nice to keep the lease in our name for the security of our assets. If this lease transaction is not acceptable, then a transfer to JG Marine can be done.

Cordially,

Steve Keller

March 2, 2025

Wrangell Borough Mayor & Assembly Members
Port Commission Members

PO Box 531
Wrangell, AK 99929

Dear Wrangell Borough Mayor, Assembly Members & Port Commission Members,

I am writing this letter in response to a letter sent to Steve Keller, dba Keller Marine regarding the lease of Marine Center Lot 4, which he has held since February of 2011. I worked with Steve Keller for several years doing boat repair and fabrication, with a plan to purchase his business. The purchase was finalized, with a four-year rental/purchase plan. Steve prepaid the current year's lease as part of the agreement.

My business plan is to continue working on boat repair and fabrication, consisting of fiberglass and fabrication of aluminum parts for boats, including but not limited to masts, booms, top houses, trolling and stabilizer poles.

I am requesting that the lease for Marine Center Lot 4 remain in Keller Marine's name as he requested in his letter. Once the four year rental/purchase agreement has been fulfilled, I would request at that time the lease be transferred to myself, Jared Gross, dba JG Marine.

Please do not hesitate to reach out to me with any questions you may have regarding my business or the rental/purchase agreement.

Sincerely,

Jared Gross
dba JG Marine
PO Box 1374
Wrangell, AK 99929
907-305-0307

Fourth Modification to the Facility Lease Agreement

in the Wrangell Marine Service Center (WMSC)

Yard Lot 4

This **fourth** modification to extend the Facility Lease Agreement for an additional five (5) years and updating the monthly rate is made and entered into as of July 1, 2022, by and among:

Steve Keller, dba Keller Marine, PO Box 133, Wrangell, Alaska, 99929, and the City and Borough of Wrangell, Alaska, 99929.

Now therefore, both parties agree as follows:

A. The following three (3) modifications were approved by the Borough Assembly:
Modification No. 1 on 2/28/2012 to increase lot to 45' x 53' = 2,650 square feet;
Modification No. 2 on 5/6/2014 to increase lot to 50' x 68' = 3,332 square feet;
Modification No. 3 on 3/15/2016 to renew lease for an additional five (5) years.

B. This amendment changes Section 1, Duration, and Section 4(a), Conditions of Leasing, of the original agreement and second extension as follows:

SECTION 1, DURATION

This lease shall be in effect for an additional five-year term, more specifically, from the date above until June 30, 2027.

SECTION 4, CONDITIONS OF LEASING

a. Lease payments shall be 0.104 x the total square footage (stated below) and payable in advance on the 1st day of each month for FY 2022 (July 1, 2022 – June 30, 2023) and shall increase at a rate of 2% each FY thereafter as follows:

		2% increase each year
July 1, 2022 – June 30, 2023	**$346.53**	**each month**
July 1, 2023 – June 30, 2024	**$353.46**	**each month**
July 1, 2024 – June 30, 2025	**$360.53**	**each month**
July 1, 2025 – June 30, 2026	**$367.74**	**each month**
July 1, 2026 – June 30, 2027	**$375.09**	**each month**

Upon execution, this fourth amendment will become an attachment to the original agreement, dated February 28, 2012.

Steven Keller, dba Keller Marine Repair

4/10/2022

Date

Stephen Prysunka, Mayor

6-9-2022

Date

(Attest) Kim Lane, Borough Clerk

Third Amendment to Wrangell Marine Service Center (WMSC) Facility Lease Agreement

This **third** amendment made and entered into as of March 15, 2016 by and among:

Steve Keller, dba Keller Marine Repair, P.O. Box 133, Wrangell, Alaska 99929, and the City and Borough of Wrangell, Alaska, P.O. Box 531, Wrangell, Alaska 99929.

Now therefore, both parties agree as follows:

A. Steve Keller entered into an original WMSC Facility Lease Agreement dated February 8, 2011 with the City and Borough of Wrangell as follows: Yard Lot 4 – originally 45X53=2,385 square feet;

B. The Borough Assembly granted a modification on February 28, 2012, to boat yard lease as follows:

Yard Lot 4 – revised 2/28/2012 to 50X53=2,650 square feet.

C. This amendment is reflected in the original agreement as follows:

Yard Lot 4 – revised 4/23/2014 to 50'X68'= 3,332 square feet.

D. Steven Keller, DBA Keller Marine Repair chose to renew the lease for an additional five (5) years, as allowed in the original Lease Agreement

E. The new lease expiration is January 31, 2021

Steve Keller, Lessee

Signature

3/15/16

Date

Jeff Jabusch, Borough Manager

Signature

3/15/16

Date

(Third Amendment approved at the March 8, 2016 regular assembly meeting)

Second Amendment to Wrangell Marine Service Center (WMSC) Facility Lease Agreement

This second amendment made and entered into as of ~~April~~ May 6th, 2014 by and among:

Steve Keller, dba Keller Marine Repair, P.O. Box 133, Wrangell, Alaska 99929, and the City and Borough of Wrangell, Alaska, P.O. Box 531, Wrangell, Alaska 99929.

Now therefore, both parties agree as follows:

A. Steve Keller entered into an original WMSC Facility Lease Agreement dated February 8, 2011 with the City and Borough of Wrangell as follows: Yard Lot 4 – originally 45X53=2,385 square feet;

First Amendment

B. The Borough Assembly granted a modification on February 28, 2012, to boat yard lease as follows:

Yard Lot 4 – revised 2/28/2012 to 50X53=2,650 square feet.

C. This amendment is reflected in the original agreement as follows:

Yard Lot 4 – revised 4/23/2014 to 50'X68'= 3,332 square feet.

Steve Keller, Lessee

Signature

5/6/14

Date

Kim Lane, Borough Clerk
City and Borough of Wrangell

Signature

5-6-14

Date

(Second amendment approved at the April 22, 2013 regular assembly meeting)

WRANGELL MARINE SERVICE CENTER (WMSC)
REVISED FACILITY LEASE AGREEMENT

This Lease is entered into on the 28th day of February, 2012, by and between the City and Borough of Wrangell (hereinafter "Lessor"), a municipal corporation, and Steven Keller dba Keller Marine Repair (hereinafter "Lessee"), doing business in the State of Alaska, for purpose of leasing borough-owned land in Wrangell. The parties hereby agree to the following conditions:

1. **DURATION:**
   This Lease shall be in effect for a five-year term, more specifically, from the date above until the 31st day of January, 2015.
2. **LEASED PROPERTY:**
   The property subject to this Lease is described as: Yard Lot 4 – 2,650 square feet (50 feet x 53 feet)
3. **PERMISSIBLE USES:**
   a. Lessee shall utilize the property only for the purpose of conducting a boat building and/or boat repair business. Accessory uses of the property are allowed if pre-approved in advance in writing by the Borough Assembly and/or Port Commission.
   b. Lessee agrees to abide by all federal, State, and local laws in the operation and maintenance of the permitted commercial activity.
   c. The Lessor does not warrant that the property is suitable for the purposes sought. Lessee assumes all risks associated with the location of the leased premises.
4. **CONDITIONS OF LEASING:**
   a. Lease payments shall be in the amount of $212.00, payable in advance on the 1st day of each month.
   b. Lessee shall comply with all rules and yard Best Management Practices as set forth by the Harbor Department or Port Commission.
   c. Lessee must sign and agree to fully comply with the WRANGELL MARINE SERVICE CENTER (WMSC) FACILITY USE AGREEMENT.
5. **RENEWAL:**
   a. The Lease may be renewed at the option of the Lessor upon written request by the Lessee within at least sixty (60) days of the expiration of the current term, provided that the Lessee is current in the payment of all fees, and that the Lessee has been compliant with all yard rules and all provisions of this agreement as determined by the Port Commission.
   b. The terms and conditions of this Lease for each renewal term shall be identical with the original term except for the lease payment.
6. **OPERATION AND MAINTENANCE:**
   a. Lessee shall at all times provide sufficient personnel to operate and maintain the leased premises. Lessee shall keep and maintain the leased premises in good, clean, safe, and sanitary conditions.
   b. Items stored on the leased premises must be directly related to the commercial business operating on the property.

c. Lessee shall be responsible for any and all special assessments for public improvements which may be made against the leased premises during the term of this Lease or any option to renew by the Lessee.
d. Lessee shall pay the property taxes owed on the leased premises in accordance with the Wrangell Municipal Code. Lessee shall also collect and remit sales tax in accordance with Wrangell Municipal.
e. Lessee shall promptly repair, rebuild, or restore the leased premises, facilities or surrounding property damaged or destroyed by any event whatsoever, with the exception of events caused by the act, error, or omissions of borough employees, contractors or representatives, or by inherent condition of normal wear and tear.
f. Lessor may, at all reasonable times and without prior notice, enter upon and inspect the leased premises. If the Lessor demonstrates that the Lessee has failed to perform maintenance or repair work required under the Lease, and if the Lessee, after prior notice of the deficiencies, fails to correct the deficiency or to begin corrective action within a reasonable time, the Lessor may enter any part of the Leased premises and perform the necessary work. The Lessee shall reimburse the Lessor for all reasonable expenses incurred by this work.

7. INDEMNITY AND INSURANCE:

a. Lessee shall defend, indemnify, and hold harmless the Lessor from any and all claims or actions for injuries or damages sustained by any person or property arising, or in connection with, or incident to the operation of the leased premises.
b. Lessee shall provide adequate liability property and personal injury damage insurance as described below. The insurance shall not contain any exclusions for pollution, environmental impairment, or nuisance. The Lessor shall be listed as an additional insured on this policy. Proof of such insurance shall be provided to the Lessor as a condition of entering into the Lease. Lessee must notify the Lessor thirty (30) days in advance of any cancellation or alternation of such insurance. Failure to maintain insurance as specifically described in this section shall constitute default by Lessee.
c. Lessee shall keep the leased premises insured at Lessee's expense against fire and other risks covered by a standard fire insurance policy with an endorsement for extended coverage. Lessee covenants that it shall maintain at all times and pay the premiums on such policy or policies of casualty insurance to the building and leased premises designated the Lessor as loss payee, said policy to be in such amount and contain such terms as shall be from time to time determined sufficient by the Lessor. Lessee shall furnish the Lessor with a copy of said policy and all amendments or modifications thereto.
d. *Insurance Requirements. The Lessee shall not commence with use of the City and Borough's facility/land until the Lessee has obtained the insurance required under this contract. All coverage shall be with insurance carriers licensed and admitted to do business in the State of Alaska. All coverage shall be with carriers acceptable to the City and Borough of Wrangell. The required lines and limits of insurance are as follows:*

1. General Liability Insurance: The User shall procure and maintain during the life of this agreement, General Liability Insurance on an "occurrence basis" with limits of liability not less than $1,000,000 per occurrence and/or aggregate combined single limit, personal injury, bodily injury and property damage.
2. Motor Vehicle Liability Insurance: The User shall procure and maintain during the life of this agreement, Motor Vehicle Liability Insurance, including applicable no fault coverages, with limits of liability of not less than $1,000,000 per occurrence combined single limit. If the vehicle is a boom truck or is a boom truck combination, the policy must contain LOAD/UNLOAD coverage.
3. Workers Compensation Insurance: If the facility user has employees, they shall procure and maintain during the life of this agreement, Workers Compensation Insurance, including Employers' Liability Coverage, in accordance with all applicable statutes of the State of Alaska.
4. Additional Insured: General liability insurance and vehicle liability insurance, as described above, shall include an endorsement stating the following shall be an Additional Insured:

   The City and Borough of Wrangell, it's elected and appointed Officials, all employees and volunteers, all boards, commissions and/or authorities and board members, including employees and volunteers thereof.

   This coverage shall be primary to the Additional Insured's and not contributing with any other insurance or similar protection available to the Additional Insured's, whether the other available coverage is primary, contributing or excess.
5. Cancellation Notice: General liability insurance and vehicle liability insurance, as described above, shall include an endorsement stating the following: "Sixty" (6) days advance written notice of cancellation, non-renewal, reduction and/or material change shall be sent to: Greg Meissner, Harbormaster, City and Borough of Wrangell, P.O. Box 531, Wrangell, Alaska 99929.
6. Proof of Insurance Coverage: Prior to commencement of any maintenance or repair activities at the WMSC, the user shall provide the City with certificates of insurance and/or policies, acceptable to the City and Borough of Wrangell, for each of the insurance policies described above.

8. ENVIRONMENTAL INDEMNITY:

a. Lessee acknowledges and agrees that environmental contamination may exist on or adjacent to the leased premises. Lessor has not made, and Lessee has not relied on, any representations as to the presence, absence, nature, or extent of any such environmental contamination by Lessor. Lessee hereby expressly assumes the risk that any such environmental contamination may cause loss of or damage to Lessee's real and personal property and improvements and may render the leased premises unfit for Lessee's purposes.

b. Lessee shall use, store, handle, and deal with all Environmental Substances (as defined below) in compliance with all Environmental Laws (as defined below). Lessee shall take prompt and responsible action to correct a noncompliance reported by Lessee or alleged by DEC or EPA with any requirements of any Environmental Law or any contamination or pollution caused by a release (as defined below) of an Environmental Substance. Lessee shall obtain all necessary permits, licenses, and other authorizations issued pursuant to Environmental Laws required for Lessee to own or operate the leased premises. Operation of the leased premises shall be in compliance with any terms and/or conditions of such permits, license, and other authorizations. "Environmental Laws" means all federal, State, or local laws, statutes, ordinance, codes, rules, regulations, orders, decrees, and directives imposing liability or standards of conduct for or relating to the protection of health, safety, or the environment. "Environmental Substances" include without limitation any substance, material, waste, pollutants, contaminant or chemical, regardless of how it is referred to or defined, that is regulated in, or pursuant to, any Environmental Laws. "Release" includes an actual or potential discharge, deposit, spill, leak, pumping, pouring, emission, emptying, injection, escape, leaching, seepage, or disposal which is or may be in breach of any Environmental Law, regardless of cause. "Lessee" includes Lessee, any subsidiaries of the Lessee, any partnership or joint ventures involving the Lessee, Lessee's agents, representatives, employees, invitees, or contractors or any agents, representatives, employees, invitees, or contractors of Lessee's subsidiaries, partnerships, or joint ventures.

c. Lessee acknowledges and agrees that the creation, use, handling, storage, release, and disposal of waste, garbage, pollutants, and toxic or hazardous substances, and the investigation, remediation, and clean-up of environmental contamination, are governed by a wide variety of Environmental Laws. Lessee shall comply with all Environmental Laws and exercise the highest degree of care in the use, handling, and storage of hazardous substances and Environmental Substances and shall take all practicable measures to minimize the quantity and toxicity of hazardous substances and Environmental Substances used, handled, or stored on the leased premises.

d. Lessee shall defend, indemnify, and hold harmless Lessor from and against all claims, including nuisance described in 9 of this Lease liabilities, suits, obligations, fines, judgments and penalties (and any other expenses, including attorneys' fees and other costs of litigation, raised, sought, or imposed by third parties in connection with Lessee's violation of any Environmental Laws or in connection with Lessee's creation, use, handling, storage, release, or disposal of any waste, garbage, pollutants, or toxic or hazardous substances (regardless of whether such creation, use, handling, storage, release, or disposal violated an Environmental Law) on the leased premises or in connection with Lessee's use of the leased premises or by any persons or entity associated with the Lessee as outlined in paragraph 8.B above.

e. Nothing in this Lease alters any obligation Lessor or Lessee may have to investigate, remediate, or clean up any environmental contamination that may exist on the leased premises.

f. Lessee shall defend, indemnify, and hold harmless the Lessee for any contamination on the leased premises or any violation of any local, State, or federal Environmental Law occurring after the baseline study required under paragraph 4.d of this Lease.

9. WASTE AND NUISANCE PROHIBITED:

During the term of this Lease, Lessee shall comply with all federal, State, and local laws affecting the leased premises, the breach of which might result in any penalty on Lessor or forfeiture of Lessor's title to the leased premises. Lessee shall not commit, or suffer to be committed, any waste on the leased premises, or any nuisance. Lessee shall not operate the leased premises in any manner which might constitute a nuisance.

10. ABANDONMENT OF LEASED PREMISES:

Lessee shall not vacate or abandon the leased premises at any time during the term of this Lease. If Lessee shall abandon, vacate, or surrender the leased premises, or be dispossessed by process of law or otherwise, any personal property belonging to Lessee and left on the leased premises shall be deemed to be abandoned, and at the option of the Lessor, the personal property shall become the property of the Lessor, except such property as may be encumbered to the Lessor. Lessee agrees to defend, indemnify, and hold harmless the Lessor for any harm, damage, or injury to person or property, alleged to arise out of the actions of the Lessee in vacating or abandoning the leased premises, and as to any harm, damage, or injury to person or property arising out of the condition of the property at the time of vacating or abandoning the leased premises.

11. LIENS:

Except with respect to activities for which Lessor is responsible, Lessee shall pay all claims for work done on and for services rendered or material furnished to the leased premises, and shall keep the leased premises free from any liens. If Lessee fails to pay such claims or to discharge any lien, the Lessor may do so and collect the cost as additional rent. Any amount so added shall bear interest at the highest legal rate as allowed by law from the date of payment by the Lessor. Any amount paid by the Lessor on behalf of the Lessee shall be payable on demand. Such action by the Lessor shall not constitute a waiver of any right or remedy which the Lessor may have on account on Lessee's default.

12. LESSOR'S RIGHTS UNDER THIS LEASE:

a. The Lessor may sue periodically to recover damages during the period corresponding to the remainder of the Lease term, and no action for damages shall bar a later action for damages subsequently accruing.

b. If Lessee fails to perform any obligation under this Lease, the Lessor shall have the option to do so after twenty (20) days written notice to Lessee. All of the Lessor's expenditures to correct the default shall be reimbursed by Lessee on demand with interest at the highest legal rate of interest allowed by law from the date of payment by the Lessor. Such action by the Lessor shall not waive any other remedies available to the Lessor because of the default.

c. All remedies in this Lease shall be in addition to and shall not exclude any other remedy available to the Lessor under any applicable law.

13. GOVERNING LAW:

Any dispute arising under this Lease shall be governed by Alaska law. Any claim based upon this Lease or any agreement pertaining to this Lease shall be filed in the First Judicial District, State of Alaska.

14. DEFAULT:

If the Lessor determines that the provisions of the Lease are not being met and attempts to resolve the dispute in a reasonable manner are unsuccessful, written notice shall be given to the Lessee stating the nature of the deficiency and the necessary corrective action. Lessee shall either take immediate corrective action or respond to the Lessor within ten (10) calendar days stating the reason for the noncompliance and a schedule for compliance. If the Lessor determines that this response is unacceptable, the Lessor shall give Lessee written notice of default and the Lease is terminated. Lessee shall have a reasonable amount of time to remove all personal property. If the personal property is not removed within the time stated in the notice of default, the Lessor may take possession of the property.

15. TERMINATION:

Each party shall have the right to terminate this Lease upon providing written notice of the intent to terminate sixty (60) days prior to the date of termination.

16. NOTICE:

All notices and requests concerning this lease shall be in writing and addressed as follows:

Lessee: Steven Keller, dba Keller Marine Repair
P.O. Box 133
Wrangell, Alaska 99929

Lessor: City and Borough of Wrangell
P.O. Box 531
Wrangell, Alaska 99929

In witness whereof, the parties have caused this Agreement to be executed by their duly authorized representative(s) signing below.

Date: July 25, 2022

Attest: _____
Kim Flores
Borough Clerk

City & Borough of Wrangell, Alaska
Lessor

By: _____
Timothy D. Rooney,
Borough Manager

The foregoing instrument was acknowledged before me this 25 day of July, 2012, by Timothy D. Rooney, Borough Manager, and Kim Flores, Borough Clerk, respectively of the City and Borough of Wrangell, Alaska, a unified home-rule municipal corporation, on behalf of the corporation.

OFFICIAL SEAL
Lavonne Klinke
Notary Public - State of Alaska
My Commission Expires 41315

Lavonne Klinke
Notary Public for the State of Alaska
My commission expires: 41315

Date: July 25, 2012

Steven Keller
Lessee – Steven Keller dba Keller Marine Repair

By: _____
Signature

The foregoing instrument was acknowledged before me this 25 day of July, 2012, by Steven Keller, Lessee.

Official Seal
Kim Flores
Notary Public-State of Alaska
My Comm. Expires 6613

Kim Flores
Notary Public for the State of Alaska
My commission expires: 6-6-13

Item a.

MSC LOT #4

CITY & BOROUGH OF WRANGELL, ALASKA
PORT COMMISSION AGENDA STATEMENT

AGENDA ITEM TITLE:	DATE:	April 3, 2025
	Agenda Section	**10**

Approval of Sublease for Marine Service Center Lot #4 from Steve Keller dba Keller Marine to Jared Gross dba JG Marine

SUBMITTED BY:
Steve Miller, Port & Harbor Director

Reviews/Approvals/Recommendations	
☐	
Name(s)	
Name(s)	
XXXX	Attorney
☐	Insurance

FISCAL NOTE:		
Expenditure Required: $XXX Total		
FY 24: $	FY 25: $	FY26: $
Amount Budgeted:		
	FY 20 $XXX	
Account Number(s):		
	XXXXX XXX XXXX	
Account Name(s):		
	Enter Text Here	
Unencumbered Balance(s) (prior to expenditure):		
	$XXX	

ATTACHMENTS: 1. Sublease Request letter From Steve Keller 2. Facility Lease Agreement. 3. Request Letter From Jarod Gross 4. Picture of proposed lease

MOTION:
Move to approve a modification to the existing lease agreement, authorizing a sublease of Marine Service Center Lot #4 from Steve Keller, doing business as Keller Marine, to Jared Gross, doing business as JG Marine.

SUMMARY STATEMENT: Steve Keller is in the process of selling his business, Keller Marine, to Jared Gross, who will operate under the name JG Marine. The new business will continue providing boat repair and manufacturing services at the Marine Service Center. The agreement between the parties is for an initial term of four years, after

which Mr. Gross would be required to formally request a full lease transfer. During the sublease period, all terms and conditions of the original lease must be adhered to by the sublessee. An addendum to the lease agreement will be required to reflect these conditions.

CITY AND BOROUGH OF WRANGELL BARGE RAMP

CONDITION ASSESSMENT

MARCH 2025

PND PROJECT NO. 252032

PREPARED FOR:

CITY & BOROUGH OF WRANGELL
GATEWAY TO THE STIKINE

PREPARED BY:

PND ENGINEERS, INC.
9360 Glacier Highway, Suite 100
Juneau, AK 99801

P | N | D
ENGINEERS, INC.

March 10, 2025 PND 252032.01

Mr. Steve Miller
Port and Harbor Director
City and Borough of Wrangell (CBW)

Subject: Wrangell Barge Ramp – Condition Assessment

Dear Mr. Miller,

On March 4th, 2025, PND Engineers (PND) traveled to Wrangell to examine the condition of CBW's barge ramp. This letter report is intended to provide an overview and document what was observed in the field. Representative photos are included to illustrate the conditions observed.

BACKGROUND

The Wrangell Barge Ramp was originally installed in the late 1970's and is a 17-ft wide by 140-ft long, orthotropic steel box-girder bridge. The barge ramp was designed with a 9-ft diameter submerged steel tank supporting the seaward end, while the shoreward end is supported by steel bearing assemblies anchored to a concrete abutment. The design allows the seaward end of the barge ramp to be raised or lowered by adding or removing compressed air, respectively, within the submerged tank.

In the early 1990's, the barge ramp was repainted, in-place by a local contractor, and in 2021, the floatation tank was removed, repaired, and repainted. New bolts were installed when the tank was reattached to the barge ramp.

OVERVIEW

PND performed a condition assessment and load analysis in 2011, which provided the background and basis for comparing and evaluating the barge ramp's current condition. The 2011 effort included an underwater examination of the floatation tank; however, the field work for this report consisted of an above-water, "Level 1" (visual) only of all major structural components of the barge ramp.

Access beneath the barge ramp was accomplished through use of a boat. The barge ramp was examined for obvious mechanical damage, corrosion and other evidence of deterioration, with particular attention being given to the condition of the protective coatings.

OBSERVATIONS:

The current overall condition of the barge ramp is poor. It is over 40 years old and time, the elements, and the inherent nature of freight handling operations have all continued to contribute to significant deterioration. Protective coatings for the structural steel are either completely gone or in poor condition, causing significant corrosion of the steel. In addition, the profile of the barge ramp indicates it is bent, likely due to being overloaded.

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The following specific conditions were observed:

- Abutment - The steel bridge bearing assemblies appear to be functioning adequately; however, protective coatings have been completely gone for many years and the steel components have varying levels of corrosion. All plate steel has a moderate level of corrosion with some flaking, while the bearing assembly anchor bolts are corroded to the extent that the threads are barely visible and the anchor bolt nuts no longer have sharp edges but instead are "conical" shaped. "Doubler" plates have been added on the bottom surface of each bearing saddle due to the extent of mechanical wear that had resulted in the elevation of the barge ramp deck dropping below the elevation of the concrete abutment and upland approach.
- Barge Ramp Superstructure - Overall condition of the barge ramp steel elements is poor. In the 2011 report, condition of the paint coating system was noted as poor, particularly on the underside of the main box-girders where a significant amount of surface corrosion was documented. With a compromised coating system and daily exposure to salt spray, the level of corrosion has notably increased on all ramp elements. In particular, corrosion of the box-girder bottom flanges has progressed extensively and varies from "moderate" to "severe" as defined by the ASCE Guide *"Waterfront Facilities Inspection and Assessment"*. This means the steel exhibits extensive pitting and localized section loss (i.e. flaking) from laminar corrosion (layered appearance of steel easily removable by hand – see photos).

  Most importantly, while condition varies along the length of each girder, significant portions of the bottom flange-to-web structural welds also exhibit this high level of corrosion. This condition represents a greater structural concern, particularly in an overload situation. If the deteriorated welds crack due to overstress and a crack propagates along the girder length, the box-girder webs could eventually separate from the bottom flange, leading to failure of a girder and the barge ramp.

  In addition, the barge ramp was observed to be bent (i.e. negative curvature from ramp self weight only), likely due to being overloaded. Typically, bridges of this length are fabricated with a positive "camber" of 2-3 inches above horizontal. A string line run along the barge ramp revealed a negative camber of slightly over 1 inch. On site was a steel electrical cable spool (see photos) nearly the height of two stacked shipping containers. This, along with the capacity of steel flats (38 tons maximum gross weight) and containers (45 tons maximum gross weight), would far exceed the barge ramp safe load capacity stipulated in the 2011 load analysis when transported by the forklifts currently on site. According to the equipment data plates, the forklifts weigh approximately 77 tons total, with 46 tons on the front axle and 31 tons on the rear (steering) axle. The combined total on the front axle with either a flat or container at its maximum gross weight would be more than 80 tons which is significantly greater than the 70-ton axle and 77-ton total forklift vehicle weight load limit currently posted on the barge ramp.

  Overstress (beyond yield strength of the material) of a structure with full-thickness of steel and full-strength of welds will result in permanent deformation (i.e. structure being bent). On the other hand, overstress of a structure with reduced steel thickness will result in permanent deformation at a lower load, and a structure with less than full-strength welds has the potential for failure.

CONCLUSIONS:

Current condition of the barge ramp, combined with the magnitude of operational loads imposed by current freight handling equipment warrants concern for potential failure of the ramp. Short-term

recommendations include reducing the current magnitude and frequency of operational loads to the greatest extent possible, and consideration be given for different means/methods of freight handling and/or an alternative location for freight operations (i.e. pass/pass at concrete dock adjacent to boat lift). If the loss of girder flange steel thickness due to corrosion is quantified as a uniform 1/8-inch, then the ramp capacity would be reduced to approximately 96% of the original capacity. This equates to a maximum axle load of 67 tons and a total forklift vehicle weight of 74 tons.

Long-term recommendations would include substantial refurbishment or full replacement of the barge ramp. With the current equipment and anticipated loads, a new barge ramp with greater capacity would be a more feasible option.

PND appreciates the opportunity to assist you with evaluating the condition of CBW's barge ramp and providing recommendations for your consideration. Please feel free to contact us at your convenience if you have any questions or wish to discuss any content of the report.

Sincerely,

PND Engineers, Inc. | Juneau, AK

John DeMuth, P.E., S.E.
Vice President

Attachment – Photo Log

FIGURE 1. Overall view (south side looking north) of barge ramp.

FIGURE 2. Profile of the barge ramp (south side).

FIGURE 3. Barge ramp deck looking ramp from abutment.

FIGURE 4. Floatation tank operation platform and ramp connection struts (south side).

FIGURE 5. Floatation tank connection plates with new bolts.

FIGURE 6. Tether cable on north side of barge ramp.

FIGURE 7. Tether cable missing/detached from barge ramp on south side.

FIGURE 8. Bottom flange of barge ramp girders, looking shoreward from floatation tank.

FIGURE 9. Typical barge ramp girder bottom flange – coating loss and laminar corrosion.

FIGURE 10. Close-up of laminar corrosion and deteriorated weld on barge ramp girder bottom

FIGURE 11. Corrosion and loss of weld material along bottom flange edge at web junction.

FIGURE 12. Corrosion at abutment bearing assembly; deformed/repaired saddle bearing.

FIGURE 13. Cracked repair weld at abutment bearing pivot pipe.

FIGURE 14. Typical coating failure and advanced corrosion of ramp floor beam.

FIGURE 15. Close-up of advanced corrosion at typical floor beam connection.

FIGURE 16. Typical blistering of deck plate (underside) between deck ribs.

FIGURE 17. Sag at mid-span of the barge ramp (i.e. ramp bent due to overloading).

FIGURE 18. Forklift used for handling freight; 77 ton weight; 33 ton safe working load.

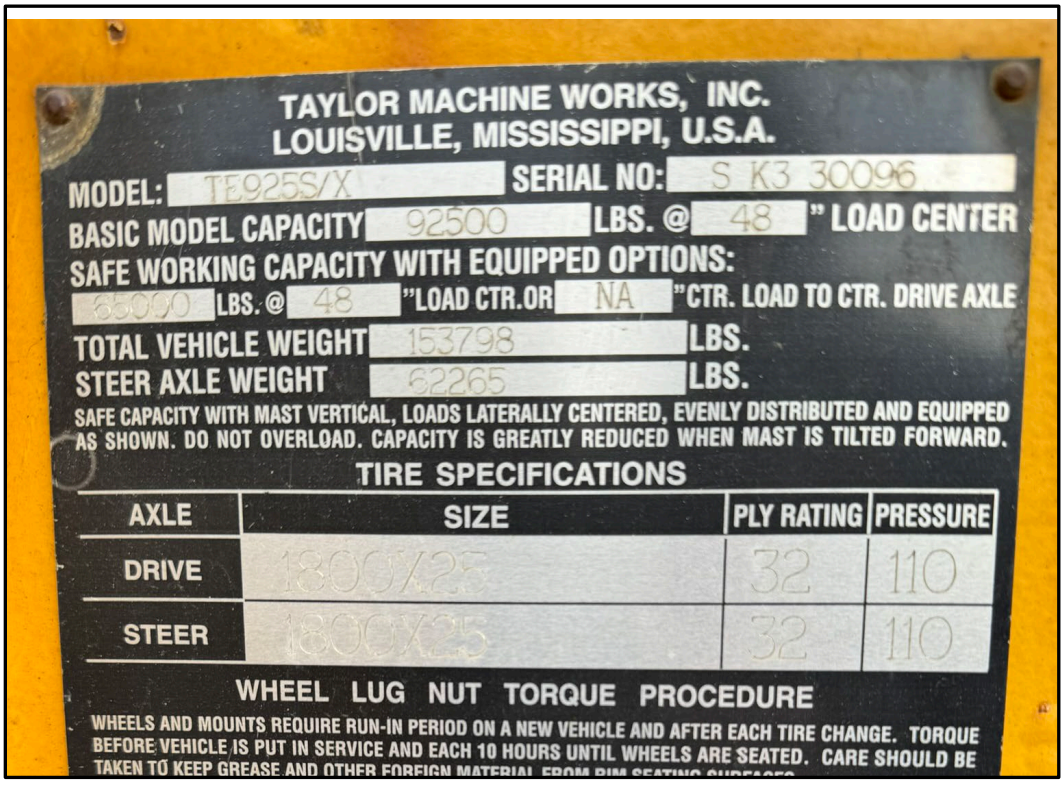
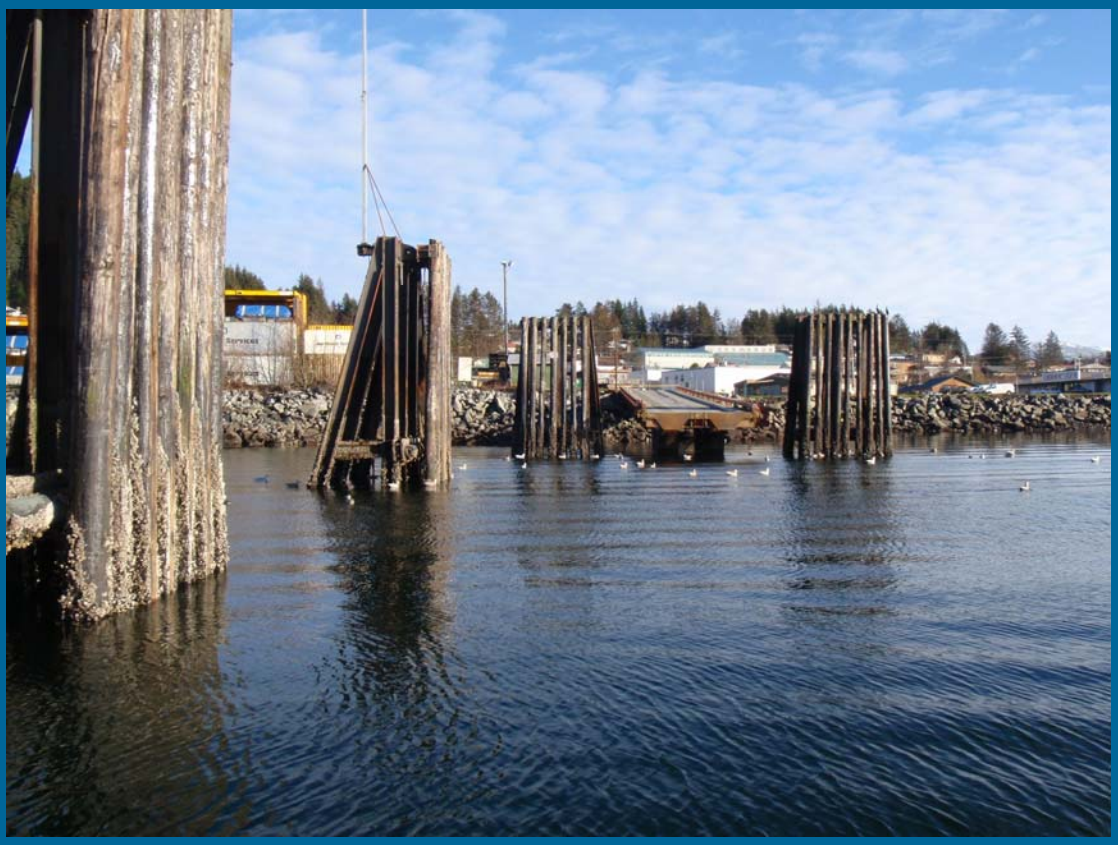


FIGURE 19. Data plate on forklift with weight and lifting capacity.

FIGURE 20. Steel flats for handling freight with weight capacities.

FIGURE 21. Steel electrical cable spool; weight estimated to be over 40 tons.

WRANGELL BARGE RAMP CONDITION ASSESSMENT



Prepared for:
City and Borough of Wrangell
Department of Public Works & Capital Projects
P.O. Box 531
Wrangell, Alaska 99929

Prepared by:

March 2011

WRANGELL BARGE RAMP CONDITION ASSESSMENT

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Section 1

Inspection Report

PND ENGINEERS, INC.

March 11, 2011 PND 102077.01

Ms. Amber Al-Haddad
Project Manager
City and Borough of Wrangell
P.O. Box 531
Wrangell, Alaska 99929

Re: Wrangell Barge Ramp Condition Assessment

Dear Ms. Haddad:

The following report is a summary of the recent condition assessment performed by PND Engineers, Inc. (PND) for the Wrangell Barge Ramp. PND was assisted by Echelon Engineering, who performed the underwater portion of the condition assessment, and by Tinnea and Associates, who performed a corrosion inspection of the facility. The purpose of this report is to provide the City and Borough of Wrangell (CBW) with a general overview of the current condition of the Barge Ramp facility, and to identify specific areas and components of the facility that need repair and/or replacement. The report provides recommendations to address the conditions noted, and includes discussions of the life-expectancy and cost feasibility associated with potential maintenance options.

OVERVIEW

The Wrangell Barge Ramp facility was originally constructed in the late 1970's and consisted of a 17-ft wide by 140-ft long steel transfer bridge with six, multi-pile breasting dolphins. The bridge was designed with a 9-ft diameter submerged steel tank supporting the bridge's seaward end. The design allows the seaward end of the bridge to be raised or lowered by adding or removing air, respectively, within the tank.

In the early 1980's, when major repair and expansion work was being done on the Wrangell City Dock, significant modifications were also completed on the barge ramp facility. All six original pipe-pile framed breasting dolphins were replaced with five, H-pile framed breasting dolphins and an earth-filled, circular sheet-pile mooring/breasting dolphin. The circular sheet-pile dolphin is positioned such that it is utilized both by barges at the barge ramp facility as well as vessels staged at the adjacent City Dock. The H-pile framed dolphins absorb vessel berthing energy through the use of a timber fender pile/rubber fender block system connected to the dolphin structure with stay chains. The circular sheet-pile dolphin absorbs energy through the use of multiple cylindrical rubber fenders suspended with chains on the exterior face of the steel sheet-piles. Though not shown on the 1981 *Barge Facility Modifications* drawings, it is assumed that this is also about the time frame in which a second, smaller submerged support tank, 7-ft in diameter, was installed shoreward and adjacent to the original support tank.

In the early 1990's, the steel transfer bridge coatings had deteriorated enough to warrant the City of Wrangell to hire a local contractor to repaint the bridge, in-place.

INSPECTION

Prior to field investigations, all available design documents and related construction records were collected and reviewed. A base map was then developed to identify specific elements of the facility (see Section 2 - Barge Facility Plan).

The condition assessment field work was carried out in two parts. The dive inspection was performed by PND's sub-consultant, Echelon Engineering, on October 22, 2010, while the corrosion and overall facility inspections were performed by Tinnea and Associates, and PND on November 10, 2010.

The dive inspection examined all 33 steel dolphin H-piles and both submerged cylindrical steel bridge support tanks. See Section 4 of this report for a complete description of the underwater portion of the condition assessment.

PND and its sub-consultant, Tinnea and Associates performed an above-water, "Level 1" (visual) inspection of all major structural components. Access beneath the transfer bridge and at each dolphin location was accomplished through the use of a boat. The facility was examined for obvious mechanical damage, corrosion and any other evidence of deterioration, with particular attention being given to the condition of the dolphin structure piles and the transfer bridge's protective coatings. Approximately 30% of the dolphin structure piles had a "Level 3" inspection performed (portions of the marine growth removed in the intertidal zone to facilitate examination), and ultrasonic thickness readings were taken, to assess the amount of original steel material remaining. See Section 5 of this report for Tinnea and Associates' corrosion assessment report.

Observations:

In general, the current overall condition of the facility is fair. None of the observations made presented any immediate structural concerns. However, the facility is over 30 years old and time, the elements, and the inherent nature of barge operations have all taken their toll. With the exception of steel components in the intertidal zone, the protective coating system for the facility's structural steel is fair in some instances, but mostly it is in poor condition. The dolphins exhibit evidence of being repeatedly hit hard by barges using the facility. Virtually all stay chains connecting the timber fender pile/rubber fender block system to the dolphin structure are broken and/or missing. Some timber fender piles are displaced, and in some instances, the entire dolphin structure itself has been permanently displaced.

The following specific conditions were observed:

Transfer Bridge:

- Abutment - The steel bridge bearing assemblies are still structurally adequate; however, the protective paint coating is in poor condition. The north bearing assembly has significant mechanical wear such that the bridge sets approximately an inch lower on the north side. Minor erosion exists along the base of the concrete abutment's front face.
- Transfer Bridge Superstructure - While the overall condition of the bridge is good, with no immediate structural concerns, the condition of the bridge's protective paint coating is poor, particularly on the underside of the main box-girders where a significant amount of surface corrosion exists.
- Support Tanks - Both support tanks are generally in good condition and have an estimated 75-90% of their protective epoxy coating remaining. The 48-inch diameter steel pipe struts which connect the support tanks to the bridge are structurally sound with minimal section loss due to corrosion, but the protective epoxy coating is in poor condition, with an estimated 50% remaining. The bolted connections with which the pipe struts are attached to the bridge are in poor condition. The

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protective paint coatings have failed and a significant amount of corrosion exists on the bolts and the connection plates.

Breasting Dolphins:

- Structural Piles – All steel H-piles are structurally sound with minimal section loss due to corrosion, but the protective epoxy coating is deteriorating, particularly in the splash zone, where it is estimated that 50-75% remains. Coating from the intertidal zone to mudline is in fair condition, with an estimated 75-90% remaining.
- Dolphins B and C - Virtually all fender stay chains (and associated connection hardware) are broken and/or missing.
- Dolphin D - All timber fender piles are displaced and leaning shoreward. Virtually all fender stay chains (and associated connection hardware) are broken and/or missing.
- Dolphin F – South side of dolphin structure is displaced and leaning shoreward. Two timber fender piles and the timber chocks between them are broken. Virtually all fender stay chains (and associated connection hardware) are broken and/or missing.

Recommendations:

For marine facilities, a key factor in determining how long they will remain in service is the maintenance of protective coatings. Virtually all steel components for this facility have either reached or are close to reaching the end of their design life, and are no longer effectively performing their intended purpose. Without an intact, competent coating system, the chief concern is steel section loss due to corrosion. Section loss translates to reduced structural capacity, and eventually, structural failure. Fortunately, minimal or no section loss has occurred thus far, but the future of Wrangell's Barge Ramp Facility is at a critical juncture. On one hand, a decision to maintain the facility and extend its useful life would require prompt action and substantial funds to perform the repairs, coating restoration and cathodic protection necessary to preserve its structural integrity. On the other hand, the facility likely has another 10-15 years of useful life remaining before reaching a point where it will have degraded enough that it may no longer be considered safe to use.

If the decision is made that this facility needs to remain in its current location and be maintained as best as possible for future use, then the transfer bridge, the support tank struts and all dolphin structure piles (portions above the intertidal zone) would require field removal (over water and between tide cycles) of the existing, deteriorated coatings and installation of new protective coatings. The intertidal portion of the dolphin structure piles and the bridge support tanks would require the installation of sacrificial anodes to effectively slow down the rate of corrosion below water. In addition, the steel abutment bearing assemblies would need to be replaced with new, and the bolted connection assemblies between the bridge and the support tank struts would need to be repaired. Also, broken dolphin timber fender piles would need to be replaced, as well as all stay chains and associated connection hardware in order for the design to function as originally intended. It is PND's belief, however, that the existing dolphin fender system, as originally designed with stay chains resisting the lateral loads imposed by fully loaded cargo barges, is not adequate and will continue to be a maintenance problem. Design modifications to the existing fender system could be made to better resist lateral loads and hence, reduce future maintenance costs. It is estimated that the repair and restoration work recommended would effectively extend the useful life of this facility an estimated 15-20 years.

Another possible option might be to perform repair and/or replacement work in phases. For example, the transfer bridge could have new coatings applied as one task, and the dolphins could be systematically replaced over time. This might be more economically feasible, and would reduce the amount of time the facility would be out of service while repair/replacement work was being performed.

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If the decision is made that it is not economically feasible or cost effective to perform the necessary repairs to a facility that is already over 30 years old, the facility still has an estimated 10-15 years of useful life remaining before the protective coatings deteriorate to the point were significant section loss could occur to the structural steel elements. Many variable factors would determine how quickly these events would transpire. Regular inspections should be conducted to monitor the rate of deterioration and evaluate the structural integrity of the facility.

CONCLUSION

The barge facility is crucial to the community of Wrangell. The current condition of the facility is such that major decisions need to be made as to when and how repairs and/or replacement of the facility components will be accomplished.

PND appreciates the opportunity we have had to assist you with this work, and we trust this information serves to provide the information necessary to decide a course of action for ensuring Wrangell has a safe, functional barge facility well into the future. Should you have any questions, please feel free to contact us.

Sincerely,
PND Engineers, Inc. | Juneau Office

John L. DeMuth, P.E.
Senior Engineer

Attachments

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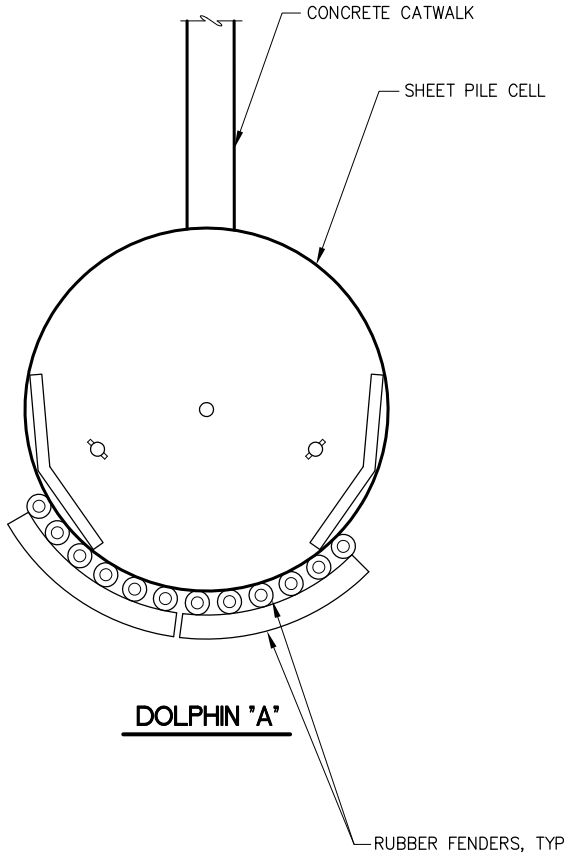
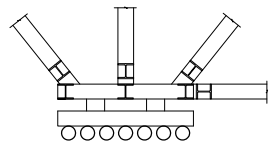
Section 2

Barge Facility Plan



DOLPHIN "A"



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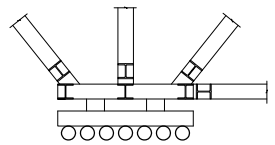

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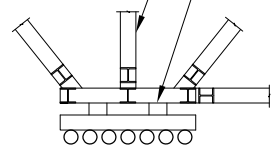

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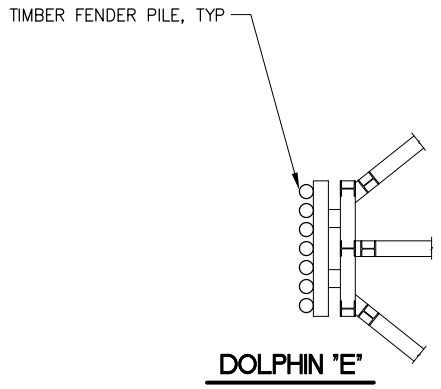

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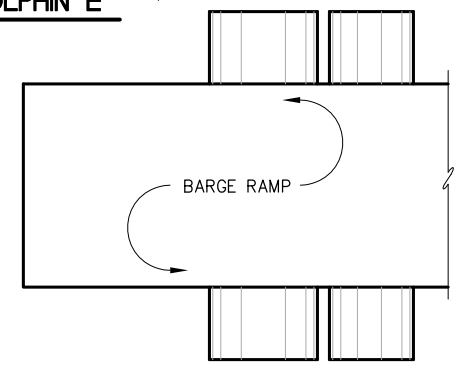
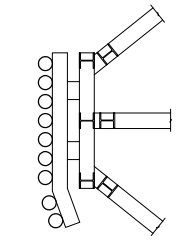




DOLPHIN "F"

BARGE RAMP AND DOLPHIN PLAN

REVISIONS

REV.	DATE	DESCRIPTION	DWN.	CKD.	APP.

P N D ENGINEERS, INC.
9360 Glacier Highway Suite 100
Juneau, Alaska 99801
Phone: 907-586-2093
Fax: 907-586-2099
www.pnd-anc.com

DESIGN: –
DRAWN: PJD
APPROVED: –
SCALE: SCALE IN FEET 0 8 16 FT.

DATE: MARCH 2011

CITY AND BOROUGH OF WRANGELL
WRANGELL CITY DOCK REHABILITATION

SHEET TITLE:
BARGE FACILITY PLAN

PN&D PROJECT NO.: 102070.01 | DWG. FILE:

SHEET 1 OF 1

Section 3

Photographs

Overall view of barge ramp facility, looking east.

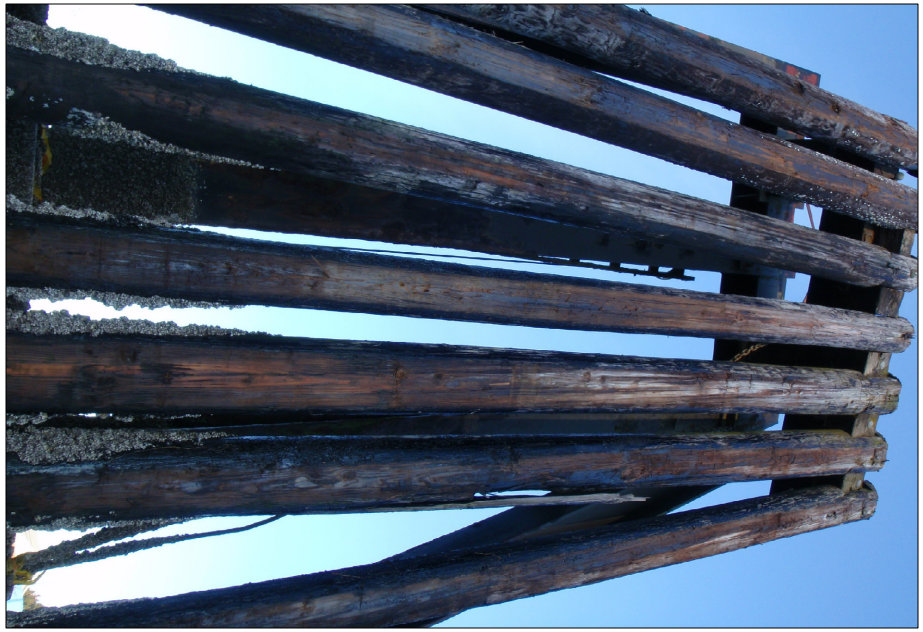
Barge ramp, looking north.

Barge ramp, looking east.

Overall barge ramp, looking north.

End of barge ramp, looking shoreward.

End of barge ramp, looking south.



Displaced fender piles at Dolphin "D".

Broken stay chains at Dolphin "D".

Displaced fender piles at Dolphin "D", looking north.

Broken stay chains at Dolphin "D".

Broken fender pile at Dolphin "F".

Profile of Dolphin "F", looking west.

Dolphin "F", looking east/shoreward.

Broken stay chains at Dolphin "F".

Original stay chain configuration at Dolphin "E".

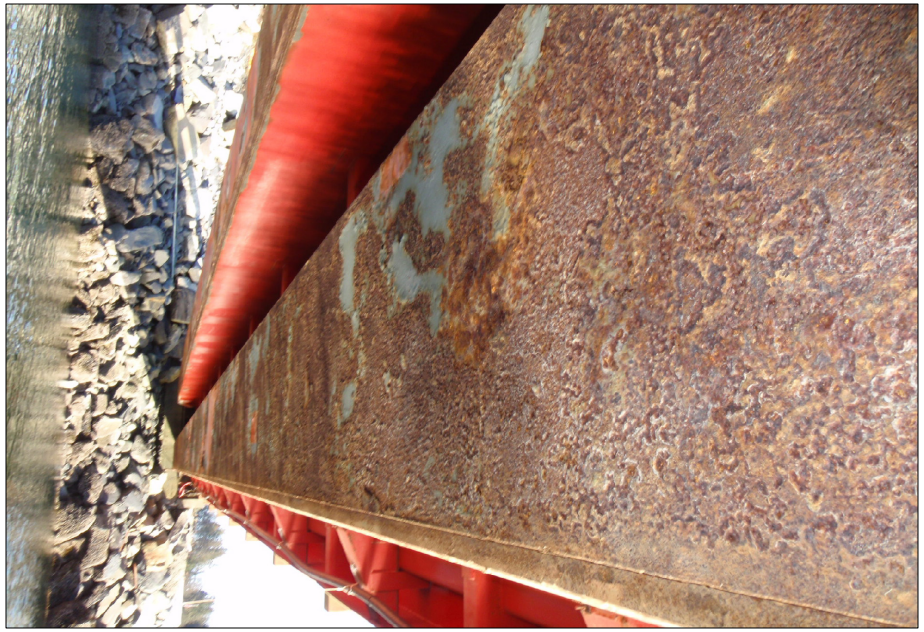
Broken stay chains at Dolphin "C".

Transition plate at barge ramp abutment.

North bearing assembly, debris and worn steel; coating failure on all steel components.

Top deck surface of barge ramp, looking shoreward.

South bearing assembly; coating failure on all steel components.



Ramp box-girder bottom flange corrosion.

Typical coating failure/corrosion of girder bottom flange.

Ramp box-girder bottom flanges; coating failure, minor corrosion, typical.

Ramp box-girder bottom flanges; coating failure, minor corrosion, typical.

Ramp/support tank connection assembly.

Typical minor corrosion of ramp girder bottom flange.

Ramp/support tank connection assembly.

Typical coating failing/minor corrosion of ramp tank support strut.

Coating failure/corrosion at ramp/support tank connection assemblies.

Coating failure/corrosion at ramp/support tank connection assemblies.

Coating failure/corrosion at ramp/support tank connection assemblies.

Coating failure/corrosion at ramp/support tank connection assemblies.

Section 4

Echelon Engineering, Inc.
Dive Inspection Report

ECHELON ENGINEERING, INC.

Civil/Marine Consulting Engineers

Inspection and Condition Assessment of Wrangell Barge Facility Wrangell, AK

Prepared For:

PND Engineers, Inc.
9360 Glacier Highway, Suite 100
Juneau, AK 99801

ATTN: Mr. Chris Gianotti, PE
Senior Engineer
Tel: 907 / 586.2093

Prepared By:

Echelon Engineering, Inc.
21027 61st Avenue West
Lynnwood, WA 98036

ATTN: Ms. Shelley Sommerfeld, PE
President
Tel: 425 / 672.8924

December 2010
10-2380

Echelon Engineering

Civil / Marine
Consulting Engineers

December 3, 2010

PND Engineers, Inc.
9360 Glacier Highway, Suite 100
Juneau, AK 99801

ATTN: Chris Gianotti, P.E.
Senior Engineer

RE: Inspection and Condition Assessment of Wrangell Barge Facility, Wrangell, Alaska

Dear Mr. Gianotti:

This report documents the findings of our recent condition assessment of the five steel H-pile breasting dolphins and the associated transfer span floatation tanks that support the City /Borough of Wrangell's Barge Facility. The inspection was carried out as part of your structural evaluation and maintenance planning for the facility.

The project was authorized by Sub-consultant Agreement with PND Engineers, Inc. The scope of the project provided for a one day field effort to investigate the condition of the facility. Dolphin A, the cellular sheet pile dolphin which is shared with the City Dock was examined under a separate project, refer to Echelon Engineering Report 10-2379.

INTRODUCTION

The Barge Facility is located at the northern end of the City of Wrangell harbor, immediately south of and adjacent to the City Dock structure. The facility serves ocean going barges operated by Northland Navigation and Alaska Marine Lines. The facility consists of a steel transfer span which is supported by two submerged steel pipe floatation tanks, five multi-pile breasting dolphins and a circular steel cofferdam. The breasting dolphins are constructed with epoxy coated H-piles. The cellular sheet pile dolphin serves as both a turning and mooring dolphin and is located at the western end of the Barge Facility. This dolphin also serves as a mooring dolphin for the adjacent City Dock.

21027 61st Avenue West
Lynnwood, Washington 98036
Tel: 425 / 672.8924
E-mail: Echelon@echelonengineering.com

From a review of the record drawings provide we understand that the structure was originally constructed as a pipe pile supported facility in the mid to late 1970s. Modifications to the facility were apparently carried out in conjunction with expansion and repair of the City Dock in the 1980s. These modifications included the reconstruction of the pile supported breasting dolphins with H piles, the construction of the cellular sheet pile dolphin, and modifications to the transfer span floatation tank. Modification of the transfer span floatation tank appears to have included the addition of a supplemental, smaller 7 foot diameter tank installed alongside and shoreward of the original 9 foot diameter chamber. No design information or drawings of this conversion were available at the time of this investigation.

The identification of various dolphins is based on the original Barge Facility layout. The cellular sheet pile structure shared with the City Dock is identified as Dolphin A. The three breasting dolphins that define the northern edge of the barge slip are identified as Dolphins B – D from the west. Dolphins E and F serve the dual roles as the eastern breasting dolphins for the barge slip and act as guides to secure the offshore end of the transfer span.

Dolphins B – D are constructed with a total of seven H- piles configured with three vertical and four battered members. Dolphins E and F are similarly constructed but are configured using three vertical and three battered H-piles. The vertical piles within each dolphin are designated numerically 1 – 3. The batter piles are identified by the vertical member to which they are attached. In Dolphins B – D the extra batter piles are associated with the Row 1 verticals and the two batters are identified as the 1 E (east) and the 1 N (north) Batter.

The floatation tanks are designed to be adjustable by the addition or removal of air from within the main floatation chamber. Air is injected using an air port which is located off the south side of the transfer span on the top of the 9 ft. diameter tank. The original design called for a single 9 foot diameter steel chamber connected to the underside of the transfer span with large diameter steel pipe struts. Apparently at the time of the reconstruction of the Barge Facility, a smaller,7 ft. diameter floatation tank was installed on the eastern, shoreward side of the original chamber. This smaller tank is secured to the larger tank with two horizontal steel channels (~24x4) welded across the top of the two tanks and two welded across the bottom of the two tanks on a slight diagonal to accommodate the differing tank sizes. Two square steel tubes which also function as diagonal struts are secured to the east side of the smaller tank and to the transfer span.

The results of the investigation are discussed in the *Observed Inspected Conditions* section of this report. Photographs illustrating typical conditions encountered and items of note are presented in Appendix A. Appendix B provides a drawing showing the layout of the Barge Facility and the location and identification of the inspected floatation tanks and dolphin piles. Specific data on the damage and condition of the inspected members is presented in tabular format in Appendix C.

QUALIFICATIONS OF INSPECTORS

The investigation was conducted by a crew composed of professional and technical personnel capable and experienced in both the underwater and above water inspection and assessment of structural members. The personnel utilized on this project included the following Echelon Engineering staff:

S.D. Sommerfeld, P.E.	Project Manager/Engineer - Diver Licensed Professional Engineer, WA, Guam 26 Years Experience in Marine Structures Inspection & Design
E.B. Vegsund, B.Sc.	Marine Specialist/Biologist - Diver BS in Marine Biology - Emphasis on Marine Biological Studies 36 Years Experience in Marine Structures Inspection
R.C. Jenson	Inspection Technician – Diver 1 Year Experience in Marine Structures Inspection

INSPECTION METHODOLOGY AND RATING SYSTEM

The inspection was carried out under the three-tiered inspection protocol developed by the US Navy and endorsed by the American Society of Civil Engineers (ASCE). The scope of the investigation included Level I – III inspection techniques of representative piles throughout the structure. All of the piles were examined for their full accessible length. Level II cleaning and inspection was carried out on one pile in each of the dolphins (i.e. 5 piles total). For this investigation, Level II cleaning was carried out at the following three elevations: the intertidal zone, the mudline and an intermediate elevation between the two. Level III thickness readings were taken on 3 piles using either a caliper or an ultrasonic thickness gauge. On piles with intact epoxy coating the assessment was made that no corrosive section loss has occurred and therefore the thickness readings at these sites were noted as “OT” (i.e. original nominal thickness for that pile section).

Overall Condition Rating

Throughout the discussions the overall condition of the inspected piling is described as good, fair or poor in accordance with the following definitions:

- A member in **good condition** has not sustained any damage or has sustained only minor damage.
- A member in **fair condition** has sustained minor to moderate damage, but has no evidence of overstressing.
- A member in **poor condition** has sustained major to severe damage that affects the member’s load capacity. This damage may be evident as advanced deterioration, overstressing or breakage.

Pile Rating

The condition of the piles is based on the overall damage noted along the length of the member using Level I visual inspection and as augmented with detailed Level II and III inspection techniques. Areas of damage were recorded, including the location and quantification of specific deterioration encountered. A breakdown of the rating classifications is as follows:

Undamaged - Members identified as Undamaged were found to have an intact coating system and no visible deterioration or damage.

Minor Damage - Members identified with Minor damage were noted to have one or more of the following conditions:

- Deteriorated coating system
- Surface deterioration (rust) with no visible loss of thickness using Level I inspection techniques

Moderate Damage - Members identified with Moderate damage were noted to have one or more of the following conditions:

- Loss of wall thickness of up to 25% on at least 25% of the pile circumference for a pipe pile, or the perimeter of an H-pile
- Impact damage that causes deformation of the pile ≤ 2 inches
- Minor/moderate anodic loss of weldment in the heat-affected zone of pile splices

Major Damage - Members identified with Major damage were noted to have one or more of the following conditions:

- Loss of wall thickness of between 25 - 75% on at least 25% of the pile circumference for a pipe pile, or the perimeter of an H-pile
- Impact damage that causes deformation of the pile > 2 inches
- Fatigue cracking
- Moderate/major anodic loss of weldment in the heat-affected zone of pile splices

Severe Damage - Members identified with Severe damage were noted to have one or more of the following conditions:

- Loss of wall thickness over 75% on at least 25% of the pile circumference for a pipe pile, or the perimeter of an H-pile
- Major anodic loss of weldment in the heat-affected zone of pile splices

OBSERVED INSPECTED CONDITIONS

The field investigation was carried out during the period of October 18 - 22, 2010, in conjunction with the inspection of the adjacent City Dock structure. Weather during the field investigation was seasonal with a mixture of rain and dry conditions. Winds were generally calm to moderate. The tidal level during the investigation fluctuated between a low of +1.4 feet and a high of +16.0 feet (MLLW). Underwater visibility was variable. On most days the visibility in the upper most five feet of the water column was less than 5 feet horizontally due to the suspended glacial silt. Below this elevation visibility increased to 15-20 feet. Currents were experienced during the inspection but these had no significant impact on the inspection activities. The inspection findings are as follows:

Epoxy Coated H-Piles

1. The overall condition of the inspected steel piles is good. A total of 33 vertical and batter piling were inspected within Dolphins B, C, D, E, and F. All of the piling are epoxy coated H-piles.

2. All of the inspected piling were found to have sustained localized failure of the protective coating and minor surface corrosion. As a result, all of the piling have been rated in the Minor rating category. No evidence of any significant damage or deterioration was identified on any of the inspected piling.

3. The overall condition of the protective epoxy coating is poor. As illustrated in the photos, evidence of coating deterioration and failure was found throughout the dolphins. The amount of coating remaining varies but generally, the coating near the pile top is in good condition; the coating in the splash zone is effectively destroyed; and the coating on the submerged portions of the piling is generally intact. Specifically from the pile top to through the splash zone, the overall condition of the coating has been estimated to range from 50% to 75% intact and the coating from the intertidal to mudline zones has been estimated to be 90% intact.

4. In spite of the deteriorated condition of the coating system the piles remain in good condition with regards to corrosive section loss. The piles have not sustained any significant loss of thickness. Ultrasonic readings taken on three of piles show the majority to be at or near their original thickness. Table 2 of Appendix C provides the results of the Level III ultrasonic testing that was carried out on representative piles.

Transfer Span Floatation Tanks

5. Inspection of the two steel floatation tanks which provide support for the offshore end of the transfer span, found them to be in generally good condition. No evidence of any significant impact, cracking, perforation or other significant damage or deterioration was identified. Level II spot cleaning of the two tanks and the associated framing struts found the coating system to be in generally fair / good condition below water with an estimated

75-90% remaining intact. Inspection of the members in the above water splash zone noted significant deterioration of the protective coating system with an estimated 50% of the coating noted to be intact. Refer to Photo No.s 4 – 10.

6. Level III thickness readings taken at several locations on the two tanks revealed the remaining thickness of the tank end plates to be ~0.750 inches and the thickness of both pipe tanks to be ~0.375 inches. Refer to Appendix C, Table 2 for specific locations and thickness readings.
7. Level II cleaning and investigation of several of the welds associated with the framing members found no evidence of any anodic weld loss or of any cracking along the welds.
8. Investigation of the inlet / exhaust system found it to be in good condition. No apparent damage or deterioration of the inlet was identified and the three exhaust ports (~3 ft' Ø) located on the bottom of the 9 ft. tank were found to be clear and free of significant marine fouling or obstruction. Refer to Photo No.s 7 and 8.
9. Inspection identified a bracket located on the northern end plate of the 9 ft. tank. This bracket appears to be an anode bracket, however, the anode has been completely consumed. Refer to Photo No. 6.

Miscellaneous Observations

10. The shoreward end of the transfer span is supported by a concrete foundation or sill. Cursory observation of this foundation found that it is undermined for the majority of its length.

CONCLUSIONS AND RECOMMENDATIONS

This inspection has found the overall structural condition of the dolphin piling and the floatation tanks associated with the transfer span at the Wrangell Barge Facility to be generally good. However, significant damage and failure of the protective coating system on the dolphin piles and on the transfer span floatation tanks has occurred.

Of the 33 vertical and batter piles inspected within Dolphins B - F, all have been rated in the minor rating category with no evidence of any significant impact, cracking or other significant structural damage. Investigation of the piles found that failure of the coating system has occurred primarily in the above water portion of the piling in the splash zone. No evidence of any significant corrosive section loss was found on any of the examined piling.

Investigation of the steel floatation tanks and the submerged framing members associated with the transfer span found them to be in good structural condition. However these members were also noted to have sustained deterioration of the protective coating system with an estimated 50% of the coating intact in the splash zone and 75-90% of their coating intact on the submerged surfaces. No evidence of any significant impact or other damage was noted to the members or to the welded connections. One apparent anode bracket was

found on the northern end plate of the larger 9 ft. diameter tank, but no evidence of the anode was found. Investigation of the inlet / exhaust system used to raise and lower the span found no evidence of any damage or deterioration which might affect its use.

The shoreward end of the transfer span is supported by a concrete foundation or sill. Cursory observation of this foundation found that it is undermined for the majority of its length. We recommend that this condition be further investigated and evaluated for possible maintenance.

In summary, the overall condition of the piling and the floatation tanks associated with the barge facility is good. No structural maintenance repair of the piles appears warranted at this time. However, we recommend evaluation of the protective coating system and consideration of the application of new coating materials in the splash zone of the piling, along with design and installation of a cathodic protection system to protect the submerged portions of the piling as warranted. We also recommend that the City / Borough of Wrangell implement a periodic re-inspection program for the structure based on the ASCE Underwater Inspection of Marine Structure protocol. Under this regimen inspection and maintenance of the structure should be carried out on an approximate five year interval. These inspections will monitor the condition of the facility and will, as in the case of the current inspection, identify items that may require preventative or restorative maintenance. Such an approach will help to ensure the structural integrity and longevity of the barge facility, as well as the personal safety of those using the facility.

Once again, it has been a pleasure to have assisted you with this project. Should you have any questions concerning this report, or if we can assist you further, please do not hesitate to contact our office.

Yours Truly,
Echelon Engineering, Inc.

Ms. Shelley D. Sommerfeld, P.E.
President

SDS:jds
Enclosures

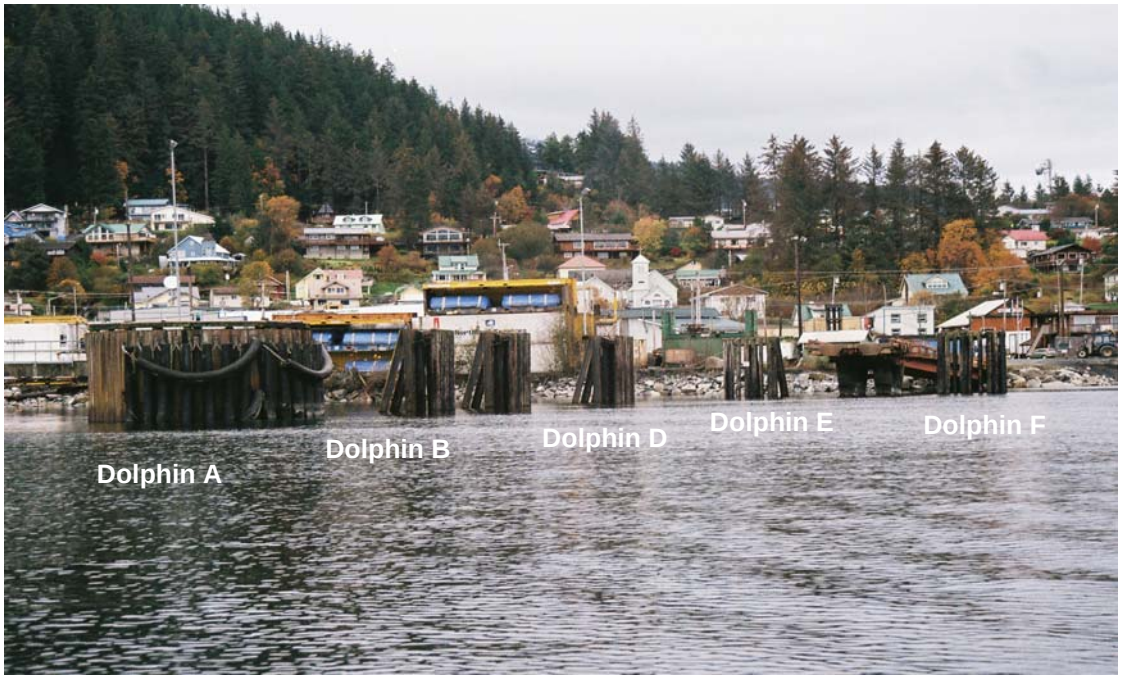


PHOTO No. 1: Wrangell Barge Facility Looking Northeast – Note the transfer span hinged off the shore. Also note the circular cofferdam, Dolphin A and the H-pile supported breasting Dolphins B – F.

PHOTO No. 2: Barge Facility Transfer Span – Note the large diameter pipe struts that connect to a nine foot diameter floatation tank located ~3 feet below the surface. The square tube struts shoreward of the pipe struts connect to a second smaller pontoon (7 foot diameter). Also note Dolphin F in the foreground.

PHOTO No. 3: Transfer Span Bridge Seat – Note the undermining of the concrete bridge seat. Also note the localized failure of the painted coating on the transfer span members.

PHOTO No. 4: Floatation Tank Pipe Struts – Note the deterioration and failure of the protective black epoxy coating on these members in the splash zone.

PHOTO No. 5: Southern Floatation Tank Pipe Strut – Note the coating failure and corrosive scale evident in the splash zone. Level III ultrasonic thickness measurements found the remaining thickness to be 0.357 inches.

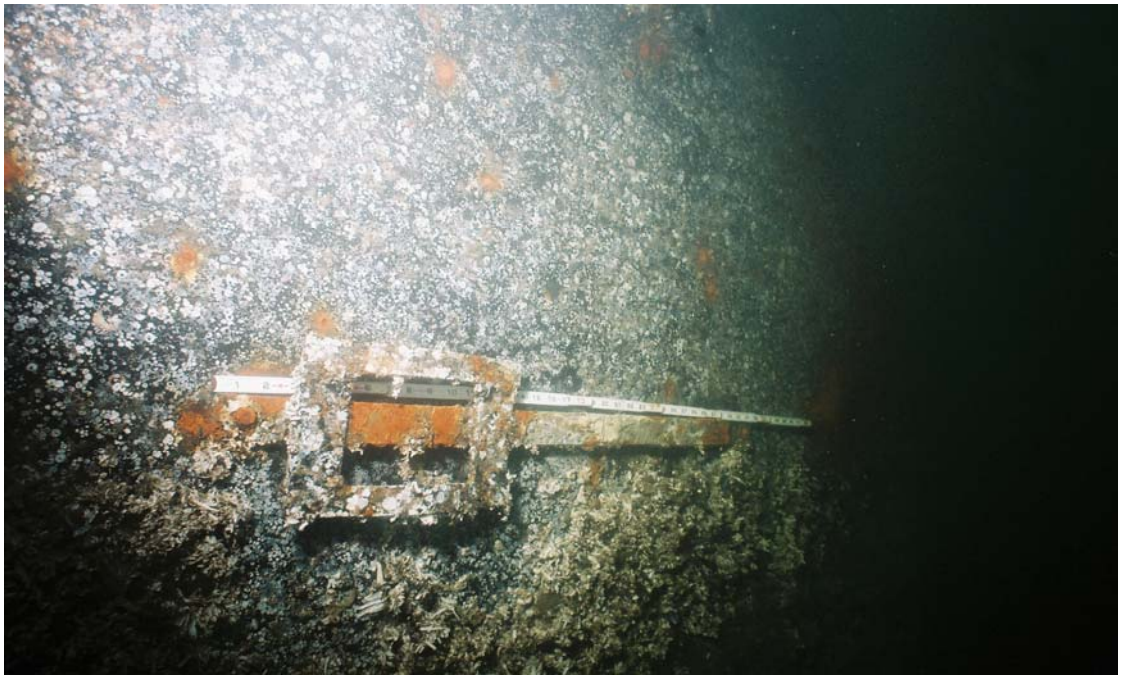


PHOTO No. 6: Floatation Pontoon Cathodic Protection Anode Bracket – Investigation of the Floatation Tanks noted this anode bracket on the north end of the larger 9 ft. diameter tank. Note the ruler lying along the top of the anode attachment bracket. The anode has been completely consumed.

PHOTO No. 7: Floatation Tank, Air Inlet Port – Note the good condition of the air inlet port located at the south end at the crown of the 9 ft. dia. tank. Also note the good condition of the coating on the two pipe struts and the minor coating deterioration in the vicinity of the inlet.

PHOTO No. 8: Floatation Tank Exhaust Port – Note the coating deterioration and minor surface corrosion on the bottom of one of the three exhaust ports located on the bottom of the 9 ft. diameter tank. Also note the good condition of the coating on the bottom of the tank.

PHOTO No. 9: Seven Foot Diameter Floatation Tank – Note the good condition of the welded connection between the square tubular strut and the floatation tank. Also not the good condition of the epoxy coating on the top of the pontoon and the localized coating failure on the strut.

PHOTO No. 10: Seven Foot Diameter Floatation Tank – Note the good condition of the welded connection between the square tubular strut and the eastern side of the floatation tank. Also not the general good condition of the epoxy coating.

PHOTO No. 11: Breasting Dolphin F – Note the good condition of the epoxy coating at the tops of the piles and the localized coating deterioration in the splash zone. Overall these piles have been estimated to retain 75% of their coating in the combined top and splash zone.

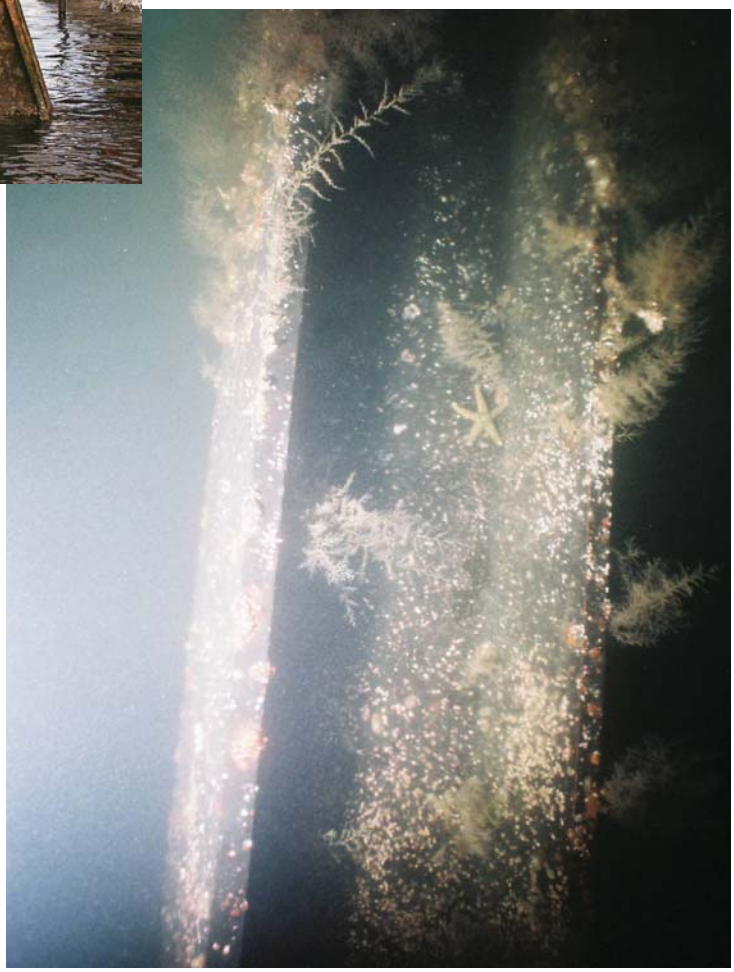


PHOTO No. 12: Breasting Dolphin C, Pile 3 Batter – Note the general good condition of the epoxy coating in the upper portion of the submerged zone. The coating at this elevation has been estimated to be 90% remaining overall.

PHOTO No. 13: Breasting Dolphin C, Pile 3 Batter – Note the yellow caliper on the flange at this Level II cleaned site and the good condition of the epoxy coating in the submerged zone.

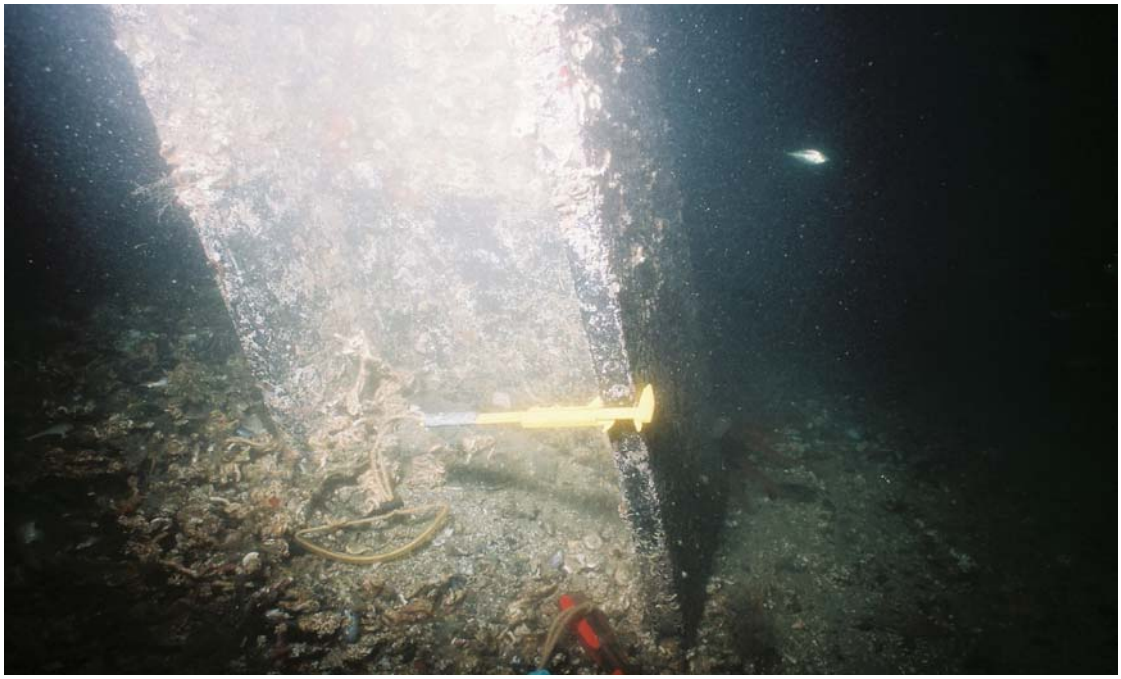
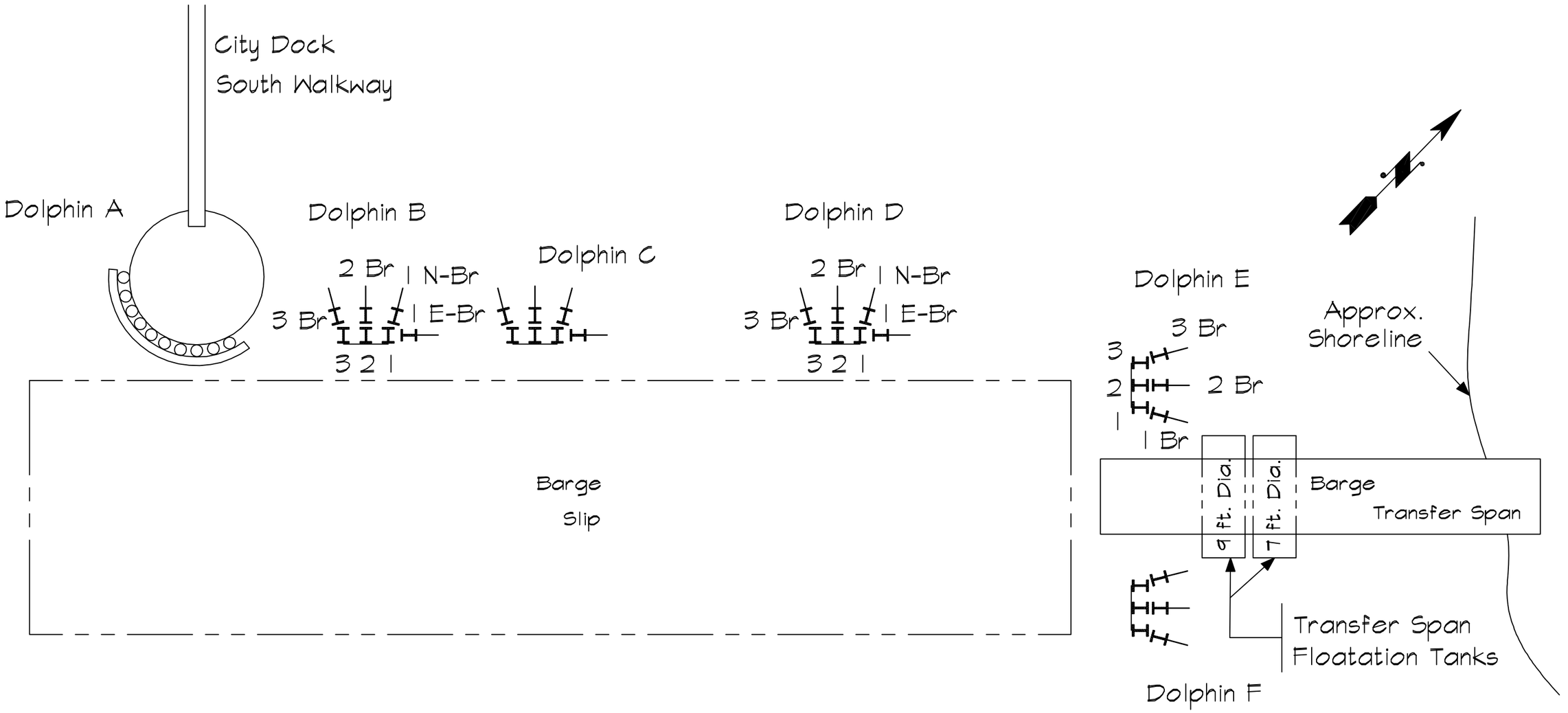


PHOTO No. 14: Breasting Dolphin C, Pile 3 Batter – Level II cleaning of this pile at the mudline found it to be in good condition with an estimated 90% of the epoxy coating intact at the mudline.



PLAN

LEGEND

X Pile ID

Steel H-Pile - Vertical

Steel H-Pile - Batter

SCALE: Not To Scale

PND Engineers, Inc.	
PILE PLAN	
City / Borough of Wrangell Barge Facility	
DATE: Dec 2010	ECHELON ENGINEERING, INC. Civil/Marine Consulting Engineers Lynnwood, Washington Tel: (425) 672-8424
PROJECT: 10-2380	
SHEET: 1 of 1	
DRAWN: SDS / JDS	

TABLE 1
PILE INSPECTION DATA

PILE LOCATION		CONDITION RATING	CONDITION / DAMAGE	
Bent	Row		Elevation (Chart Datum)	Details / Remarks
Dolphin B	1	Minor	Top / SPL ITZ / MDL	75% Coating Intact 90% Coating Intact
	1 N-Br	Minor	Top / SPL ITZ / MDL	75% Coating Intact 90% Coating Intact
	1 E-Br	Minor	Top / SPL ITZ / MDL	75% Coating Intact 90% Coating Intact
	2	Minor	Top / SPL ITZ / MDL	75% Coating Intact 90% Coating Intact
	2 Br	Minor	Top / SPL ITZ / MDL	75% Coating Intact 90% Coating Intact
	3	Minor	Top / SPL ITZ / MDL	75% Coating Intact 90% Coating Intact
	3 Br	Minor	Top / SPL ITZ / MDL	75% Coating Intact 90% Coating Intact
Dolphin C	1	Minor	Top / SPL ITZ / MDL	50-75% Coating Intact 90% Coating Intact
	1 N-Br	Minor	Top / SPL ITZ / MDL	50-75% Coating Intact 90% Coating Intact
	1 E-Br	Minor	Top / SPL ITZ / MDL	50-75% Coating Intact 90% Coating Intact
	2	Minor	Top / SPL ITZ / MDL	50-75% Coating Intact 90% Coating Intact
	2 Br	Minor	Top / SPL ITZ / MDL	50-75% Coating Intact 90% Coating Intact
	3	Minor	Top / SPL ITZ / MDL	50-75% Coating Intact 90% Coating Intact
	3 Br	Minor	Top / SPL ITZ / MDL	50-75% Coating Intact 90% Coating Intact
Dolphin D	1	Minor	Top / SPL ITZ / MDL	75% Coating Intact 90% Coating Intact
	1 N-Br	Minor	Top / SPL ITZ / MDL	75% Coating Intact 90% Coating Intact
	1 E-Br	Minor	Top / SPL ITZ / MDL	75% Coating Intact 90% Coating Intact
	2	Minor	Top / SPL ITZ / MDL	75% Coating Intact 90% Coating Intact
	2 Br	Minor	Top / SPL ITZ / MDL	75% Coating Intact 90% Coating Intact
	3	Minor	Top / SPL ITZ / MDL	75% Coating Intact 90% Coating Intact
	3 Br	Minor	Top / SPL ITZ / MDL	75% Coating Intact 90% Coating Intact

TABLE 1
PILE INSPECTION DATA

PILE LOCATION		CONDITION RATING	CONDITION / DAMAGE	
Bent	Row		Elevation (Chart Datum)	Details / Remarks
Dolphin E	1	Minor	Top / SPL	75% Coating Intact
			ITZ / MDL	90% Coating Intact
	1 Br	Minor	Top / SPL	75% Coating Intact
			ITZ / MDL	90% Coating Intact
	2	Minor	Top / SPL	75% Coating Intact
			ITZ / MDL	90% Coating Intact
	2 Br	Minor	Top / SPL	75% Coating Intact
			ITZ / MDL	90% Coating Intact
	3	Minor	Top / SPL	75% Coating Intact
			ITZ / MDL	90% Coating Intact
	3 Br	Minor	Top / SPL	75% Coating Intact
			ITZ / MDL	90% Coating Intact
Dolphin F	1	Minor	Top / SPL	50-75% Coating Intact
			ITZ / MDL	90% Coating Intact
	1 Br	Minor	Top / SPL	50-75% Coating Intact
			ITZ / MDL	90% Coating Intact
	2	Minor	Top / SPL	50-75% Coating Intact
			ITZ / MDL	90% Coating Intact
	2 Br	Minor	Top / SPL	50-75% Coating Intact
			ITZ / MDL	90% Coating Intact
	3	Minor	Top / SPL	50-75% Coating Intact
			ITZ / MDL	90% Coating Intact
	3 Br	Minor	Top / SPL	50-75% Coating Intact
			ITZ / MDL	90% Coating Intact

TABLE 2
PILE THICKNESS READINGS

PILE ID		AVERAGE THICKNESS READING (inches)				
Dolphin	Pile No.	Elevation	Flange	Web	Pipe Wall	Remarks
B	2	SPL	1.130	0.722		
		ITZ	1.155	0.712		
		SUB	OT	OT		90% Coating Intact
		MDL	OT	OT		90% Coating Intact
D	3	SPL	1.110	0.728		
		ITZ	1.130	0.718		
		SUB	OT	OT		90% Coating Intact
		MDL	OT	OT		90% Coating Intact
F	1	SPL	1.100	0.743		
		ITZ	1.105	0.745		
		SUB	OT	OT		90% Coating Intact
		MDL	OT	OT		90% Coating Intact
Transfer	9 ft. dia.	SUB			0.740	North End Plate
Span	Main Tank	SUB			0.380	Top of Tank, North End
Floatation	7 ft. dia.	SUB			0.740	North End Plate
Tanks	Supplemental	SUB			0.365	Top of Tank, North End
	Tank	SUB			0.373	Top of Tank, Near N. Strut

Section 5

Tinnea and Associates, LLC.
Corrosion Inspection Report

Port of Wrangell Barge Ramp Inspection

December 9, 2010

Prepared for:

City Borough of Wrangell, Alaska
Wrangell Harbor Department
Post Office Box 531
Wrangell, Alaska 99929

Prepared by:
Ryan Tinnea
Engineer

Tinnea & Associates, LLC
2018 East Union Street
Seattle, Washington 98122-2836

Wrangell, Alaska

Tinnea & Associates, LLC

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Introduction

On November 10, Tinnea & Associates staff inspected the City/Borough of Wrangell's (CBW) Barge Ramp and associated breasting dolphins as corrosion consultants working with PND Engineers, Inc. The purpose of this inspection was to determine the current health of the structures and to identify what measures need to be taken in order to mitigate future corrosion to acceptable levels.

Inspection

This inspection focused on the floating barge ramp and the H-pile supports to its five breasting dolphins. The breasting dolphin H-piles are all type W14x159 oriented in both vertical and battered orientations.

The inspection consisted of a visual examination of all piles and the barge ramp structural members including photographs. In addition to the visual examination, ultrasonic thickness (UT) readings were taken on one pile of each breasting dolphin at varying elevations. UT readings were also taken on selected places on the barge ramp. These tests help paint a picture of the structures' overall health.

Inspection Results

In general among all piles, the worst corrosion was seen in the few feet above high tide, referred to as the splash zone. A schematic drawing of the several tidal zones and the associated corrosion rates appears in the Figure 1. The splash zone receives frequent exposure to salt spray from the ocean. Seawater contains chloride ions, which are a corrosion accelerator for steel structures. As this area is directly exposed to the air, there is plenty of oxygen from the air, which combined with the chloride ion exposure makes this a highly corrosive environment.

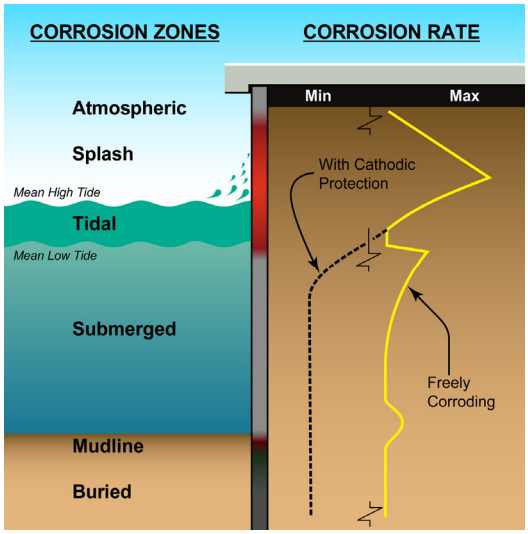

Figure 1 – corrosion rates versus exposure

Note that the corrosion rate diminishes as you move down into the tidal zone. The reason for the decline in corrosion rate is reduced oxygen availability. In the tidal zone, the piles are submerged for part of each day. Although seawater contains oxygen, it does not provide it to the steel surface for corrosion as readily as atmospheric exposure. Also at about mean tide level, marine growth becomes prevalent. Marine growth, such as barnacles, mussels, algae, and other microbes are oxygen consumers, so at the level of the steel the amount of available oxygen is markedly reduced from much higher levels available in the open ocean. This reduction in oxygen reduces the corrosion rate of the piles.

H-Piles

The H-piles on the breasting dolphins are found in both vertical and battered orientations and are all type W14x159. Nominal thicknesses of W14x159 piles are 1.190" for the flanges and 0.745" in the web. The H-piles still had tightly adhering coating throughout much of the lower tidal zone with failure of the coating in the upper tidal and splash zones (see Figure 2).

Figure 2 - coating failure in the splash zone

The geometry of H-piles allows for both sides to corrode as opposed to closed-shape pile types, such as pipe piles, which are only exposed to open seawater on one side. With closed-shape piling, microbial activity and initial corrosion quickly consume all the available oxygen and the corrosion rate for carbon steel in anaerobic conditions is so small as to not have engineering significance. This two-face exposure causes the effective corrosion rate of the H-piles to be double that of pipe piles. Overall, the web of the H-piles was in better condition with an average thickness loss of approximately 0.01" and a maximum loss of 0.04". However, the flanges are in worse condition. Average thickness loss on the flanges is 0.08" with a maximum loss of 0.14". This difference in corrosion rates is frequently observed in marine H-piles and is the result of the outer face of the flange having greater exposure to mechanical damage from flotsam or vessels.

Barge Ramp

The barge ramp is a floating structure located to the south of the main city dock used for unloading shipping vessels. Buoyancy is adjusted on the ramp using two underwater pneumatic tanks. Overall, the coating system on the barge ramp is in good condition with the exception of the bottom of the two supporting girders that run the length of the ramp.

Figure 3 - coating failure along the barge ramp girder soffits

Since it is a floating structure, much of the length of the two box girder flanges constantly sit in or near the splash zone, causing accelerated corrosion on these areas. The coating has largely deteriorated in this area (see Figure 3). The nominal thickness of the box girder flange is 0.75" in most areas with a small reinforced

area that is nominally 1.50". The actual measured thickness at each of these areas is 0.64" (0.11" section loss) and 1.27" (0.23" section loss) respectively.

Conclusions

Barge Ramp

The barge ramp is experiencing significant section loss on the girder soffits. As stated above, this is likely due to their position constantly in the splash zone. In order to increase the life of this structure, the corrosion rate needs to be reduced. Due to low time of wetness, a cathodic protection system would not be affective in this location. Instead, the coating should be replaced.

Recommendations

Petrolatum Jackets

In order to reduce the corrosion rate of the H-piles in the upper tidal and splash zones, a petrolatum jacketing system should be installed on all H-piles and pipe piles on the breasting dolphins. Petrolatum jackets function similarly to a coating system in that they act as a barrier between the piles and the corrosive seawater. The benefit of these systems is that they require less extensive surface preparation than typical coating systems, are more durable, and can be installed in wet conditions. The jackets themselves are made of fiberglass reinforced plastic (FRP) which has been molded to fit the shape of the pile it will be installed on. There is a small annulus between the FRP jacket and the pile which is filled with petrolatum. The petrolatum serves as the barrier between chloride ions in the seawater and the piles while the FRP jacket protects the system from mechanical damage. This system should be installed within the next 2 years simultaneously with the city dock jacket system to reduce the amount of future corrosion damage.

- The jackets should be installed from the pile caps to -5' MLLW in order to protect the piles from the areas of highest corrosion. Extending the jackets to five feet below MLLW avoids mechanical damage that likely will occur were the jackets terminated at a higher elevation where flotsam could catch under the lower edge of the jackets.
- Prior to installation, the piles should be cleaned of any loose corrosion product through water blasting or power tool cleaning.

Continued Corrosion Assessment

Even with corrosion mitigation strategies in place, it is important to continue with regular corrosion inspections of the dock. Coatings and jackets have finite lives, and even when employed correctly, corrosion can still occur. Corrosion assessments of the barge and dolphins should be performed alongside future corrosion investigations of the city dock at an interval of not more than 5 years between inspections.

H-Piles						
Pile Location				Thickness	Nominal	Elevation (MLLW)
Bent	Row	Pile	Location			
Dolphin B		Center Batter	N Flange	1.050 in	1.190 in	20.00 ft
Dolphin B		Center Batter	S Flange	1.084 in	1.190 in	20.00 ft
Dolphin B		Center Batter	S Flange	1.129 in	1.190 in	7.25 ft
Dolphin B		Center Batter	N Flange	1.144 in	1.190 in	7.25 ft
Dolphin C		NE Batter	S Flange	1.119 in	1.190 in	20.00 ft
Dolphin C		NE Batter	N Flange	1.124 in	1.190 in	20.00 ft
Dolphin C		NE Batter	S Flange	1.126 in	1.190 in	7.25 ft
Dolphin C		NE Batter	N Flange	1.127 in	1.190 in	7.25 ft
Dolphin D		West Batter	S Flange	1.087 in	1.190 in	20.00 ft
Dolphin D		West Batter	N Flange	1.097 in	1.190 in	7.25 ft
Dolphin D		West Batter	N Flange	1.098 in	1.190 in	20.00 ft
Dolphin D		West Batter	S Flange	1.111 in	1.190 in	7.25 ft
Dolphin E		North Vertical	W Flange	1.070 in	1.190 in	20.00 ft
Dolphin E		North Vertical	E Flange	1.107 in	1.190 in	7.25 ft
Dolphin E		North Vertical	W Flange	1.109 in	1.190 in	7.25 ft
Dolphin E		North Vertical	E Flange	1.139 in	1.190 in	20.00 ft
Dolphin F		North Batter	W Flange	1.088 in	1.190 in	7.25 ft
Dolphin F		North Batter	W Flange	1.097 in	1.190 in	20.00 ft
Dolphin F		North Batter	E Flange	1.120 in	1.190 in	7.25 ft
Dolphin F		North Batter	E Flange	1.149 in	1.190 in	20.00 ft
Dolphin B		Center Batter	Web	0.733 in	0.745 in	20.00 ft
Dolphin B		Center Batter	Web	0.745 in	0.745 in	7.25 ft
Dolphin C		NE Batter	Web	0.720 in	0.745 in	20.00 ft
Dolphin C		NE Batter	Web	0.734 in	0.745 in	7.25 ft
Dolphin D		West Batter	Web	0.709 in	0.745 in	20.00 ft
Dolphin D		West Batter	Web	0.745 in	0.745 in	7.25 ft
Dolphin E		North Vertical	Web	0.740 in	0.745 in	20.00 ft
Dolphin E		North Vertical	Web	0.760 in	0.745 in	7.25 ft
Dolphin F		North Batter	Web	0.714 in	0.745 in	7.25 ft
Dolphin F		North Batter	Web	0.746 in	0.745 in	20.00 ft

Barge Ramp						
Pile Location				Thickness	Nominal	Elevation (MLLW)
Bent	Row	Pile	Location			
Barge Ramp		Girder Bottom	Normal	0.639 in	0.750 in	N/A
Barge Ramp		Girder Bottom	Reinforced	1.270 in	1.500 in	N/A
Barge Ramp		Girder Bottom	Tank Support	0.399 in	--	N/A