

**From:** Chris Combs <combseng@ptialaska.net>  
**To:** Dean Orbison <dean@cityofsitka.com>  
**Cc:** Hugh Bevan <hugh@cityofsitka.com>  
**Date:** Monday, June 07, 1999 3:24 PM  
**Subject:** Sawmill Cove - Dock inspection report

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Dean,  
The Master Plan Consultant, Reid Middleton, recently sureveyed the condition of the Pulp and Utility Docks. Their report follows. Although not mentioned in the report, the structural engineer made some preliminary calculations that show the load capacity of the dock may be 250 lb/sq ft assuming 1/8" metal thickness on most pilings. Please review the report and give me your comments. Thank you.  
Chris Combs 747-2219

Wednesday, June 02, 1999 **DRAFT**

RM 21-99-026-001-01

Chris Combs

Sitka, Alaska

Subject: APC Facility, Silver Bay, Sitka Alaska

Dear Mr. Combs:

On May 28, 1999 we performed a brief inspection of the Pulp Dock and the Utility Dock, both at the Alaska Lumber and Pulp Company, more recently Alaska Pulp Company (APC), facility located in Silver Bay near Sitka, Alaska. Both docks were constructed in about 1958. They are of similar construction and consist of a cast-in-place concrete deck and pile caps supported by steel piling. The Pulp Dock is about 600 feet long and 80 feet wide, while the Utility Dock is about 200 feet long and 85 feet wide. The Pulp Dock has six rows of piling along its length. The three outboard rows are 16-inch diameter pipe and the remaining three rows are steel H-sections. The Utility Dock has five row of piling, the outer three are 16-inch pipe and the remaining rows are H-sections. The pipe piling on both docks are concrete filled.

The Pulp Dock is partially covered by a warehouse and the Utility Dock supports a

stationary steel frame crane with a horizontal boom that extends out over the berth at the southeast corner of the structure. The crane is scheduled to be removed as part of an on-going demolition project.

The only detailed and comprehensive inspection of the dock that we are aware of was performed in about 1977 by ABAM Engineers. A brief inspection of the dock was performed in 1991 by Peratrovich Nottingham and Drage and documented in a letter report to Daniel Jones, Sr. Project Engineer with APC. Mr. Dean Orbison prepared a short memo for Chris Combs on May 3, 1999 outlining an inspection he performed of wear on previously installed sleeves along the outboard row of pipe piling, and information on pile maintenance practices at APC up until the time they ceased operations.

All but a few of the piling supporting these docks are original and therefore almost 40 years old. They were never galvanized, coated or cathodically protected. The piling were originally selected with a 0.25 inch corrosion allowance and in 1977 ABAM determined that the maximum average annual rate of corrosion was 8 mils per year and therefore the structures had a remaining useful life of 11 years assuming no repairs or upgrades. ABAM prepared a subsequent report outlining recommended repairs, many of which were accomplished by APC over the ensuing years. Based on conversations with you, Warren Lee and Daniel Jones it seems that very few repairs, if any, have been accomplished since about 1991.

The repairs performed by APC appear to be based on the ABAM report and included "bagging" selected piling, patching damaged concrete and replacing two piling on the outboard row. It is our understanding that some of the repairs were completed by contractors and others were done by APC forces. In an attempt to reduce wear from camels along the outboard row of piling, half-sleeves were installed on about 40% of the piling along the Pulp Dock and 70% on the Utility Dock. About 50% of the sleeves on the Pulp Dock and 25% on the Utility Dock have subsequently worn completely through, exposing the concrete fill in the original piles. Over 50% of all the piling (sleeved and unsleeved) on the outer row of the Pulp Dock are worn through as are about 40% at the Utility Dock.

Steel half-sleeves have also been used extensively (90%) along the outermost row (Grid "C") of H-piling under the Pulp Dock. In this application the half-sleeves were installed and then pumped full of concrete, thus encasing the H-section within the annular space. The sleeves extend from about the +5 mean lower low water (mllw) elevation to the mudline. Eight unsleeved piling in that row are presently severely corroded, in some cases completely severed. Finally, there are currently a few pipe piling under the Pulp Dock that are extensively cracked and broken possibly from water freezing and expanding within them.

The concrete deck and caps are in fair condition. There are some areas of cracking near the outer face of the Pulp Dock possibly due to ship impacts. Efflorescence or other products of water leaching through cracks in the concrete are visible from the underside of the structures.

We understand that the Pulp Dock was originally designed for a uniform live load of 600 pounds per square foot. ABAM confirmed in 1977 that both deck structures were capable of supporting the 600 loading assuming no concrete deterioration. Whether that assumption is

still valid is questionable. Because of the way ships were being fendered against the outboard row of piling, ABAM also recommended significant load restrictions within 18 feet of the outboard face of the dock based on available pile capacity.

In spite of the repairs identified above, the general condition of the piling under both docks is poor. A detailed inspection of the docks has not been carried out in over 20 years and there are no recent and reliable measurements of remaining pile steel thickness for either structure. This information is essential in order to make a quantitative analysis of the load capacity of the docks. Any attempt to load-rate the docks without that type of information would be speculative and potentially dangerous. Given the age of the structures, the lack of cathodic protection and the estimated remaining life of the piling in 1977 we believe the strength of the piling has been significantly compromised. Any areas with broken or severed piling are particularly vulnerable. Of the two docks, our impression is that the Pulp Dock is in worse condition than the utility dock. Until such time that a detailed condition survey can be performed, we recommend that extreme care be exercised in using either structure.

Should you have questions please call (907) 562-3439

Sincerely

Reid Middleton, Inc.

G. Craig Freas, PE SE

Senior Project Manager

Anchorage Group

cc: file

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6/9/99

TO: Chris Combs  
FROM: Dean Orbison  
SUBJECT: Sawmill Cove Waterfront Structure Inspection

5/3/99

cc. Randy Cornelius  
Hugh Bevan  
Gary Paxton  
Warren Lee

A cursory inspection was made of piling on the Pulp and Utility Docks during the -.1' tide on April 29 1999.

The piling were inspected for wear and corrosion at the camel log location which is historically the problem area. Each face piling was inventoried for it's state of repair as follows:

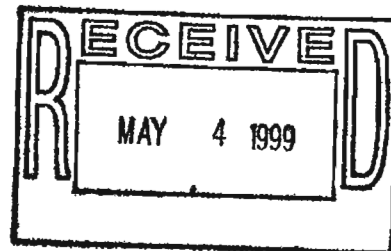
Replaced Piling	Pile replaced in about 1983.
Bagged Piling	Pile encapsulated in bag formed concrete about 1977.
Sleeved Piling	Repair sleeve installed on corroded piling since 1983.

The piling were also inspected for current condition of corrosion and wear. Specifically, piling were checked to determine if wear penetrated the steel piling or the repair sleeve, and to what extent. The Findings are indicated on drawing Y-1000 and Y1009.

The Sawmill Cove Pulp and Utility Docks are designed for 600 psf. At the time of construction a 600 psf design value was applied to general cargo piers. If a pier is not used for general cargo it may be designed as low as 250 psf.

Both docks are constructed on 16", concrete filled, steel piling in deeper areas and H-beam pile in shallow sections. There has never been a cathodic protection system for these structures and the corrosion is proportionate to the service life. Most corrosion takes place at the 0' tide location due to the rubbing of the camel logs on the piling. The camel logs were necessary for the deeper draft ships. APC's general maintenance program was to sleeve the corroded piles when the steel piling had worn through to the concrete core. See drawing Y-1081. This program began in 1983 and was done every few years. The docks have had no maintenance since the mill closed in 1993. A significant amount of maintenance will be required to maintain the 600 psf design. Some corrosion was noted at the high tide which I had not seen in previous inspections. When I did underwater inspections years ago I did not find corrosion at the mud line and would be surprised to see it today.

The concrete decks do not show significant signs of deterioration and will maintain their integrity even in the case of failed piling as in the past.



Recommendations:

- 1) Remove camel logs from piling faces.
- 2) Investigate the cost of piling replacement for bad face piling. (Sound Marine, WS)
- 3) Investigate the cost and feasibility of continuation of the sleeving program.
- 4) Investigate the cost of a cathodic protection system.
- 5) Finish sleeving the corroded H piles.
- 6) Derate the dock if prudent.