Sawmill Cove
INDUSTRIAL PARK
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Tuesday, May 26, 2009

MEMORANDUM

To: Sawmill Cove Industrial Park (SCIP) Board of Directors

From: Garry White, Director

Subject: Utility Dock

Introduction

The SCIP Board at their 05/30/09 meeting suggested that a further analysis of the Utility Dock be considered.

Background

Attached are a few pages from the 1999 Reid Middleton assessment of the docks located at the SCIP.

Additional Information

On May 11, 2009, Scott Brylinsky and I took advantage of a negative tide and inspected the piling of the utility dock. A video and photographs will be presented at the 05/28/09 meeting.

I have contacted PND Engineers in regards to estimated costs to investigate the dock further by engineers.

- Estimated $2-3k to have a person from their firm do a visual inspection of the dock.
- Estimated $8-10k to have a team of engineers visually inspect the dock and give recommendations on usage.
- Estimated $50k+ to complete core samples of the concrete deck and determine overall strength of deck and pilings for intended heavy use of the dock.

Marine Structures

Docks

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 rows 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 the Pulp Dock Warehouse and the Utility Dock supports a stationary steel frame chip unloading 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, City and Borough of Sitka Electrical Generation Superintendent and former APC Senior Project Engineer, 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 are almost 40 years old. They were originally coated but have never been cathodically protected. There is no remaining coating and there probably has not been for some time. 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. Therefore, the structures had a remaining useful life of 11 years assuming no repairs or upgrades. ABAM prepared a subsequent report outlining recommended repairs, some of which were accomplished by APC over the ensuing years. Apparently 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" (see photo PD7) selected piling, patching damaged concrete, installing bolted half-sleeves, 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 personnel. In an attempt to reduce wear from camels along the outboard row of piling, half-sleeves (see photo PD8) were installed on about 40 percent of the piling along the Pulp Dock and 70 percent on the Utility Dock. About 50 percent of the sleeves on the Pulp Dock and 25 percent on the Utility Dock have subsequently worn completely through, exposing the concrete fill in the original piles. Over 50 percent of all

the piling (sleeved and unsleeved) on the outer row of the Pulp Dock are worn through, as are about 40 percent at the Utility Dock.

Steel half-sleeves have also been used extensively (90 percent) 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 (see photo PD9), in some cases completely severed. There is also evidence that corrosion near the high-water line is becoming a problem as evidenced by knife-edging of the H-piling. In one case we observed what appeared to be localized buckling of the flanges (see photo PD3) where there was less than 0.25 inches of steel remaining on the flange. Finally, there are currently a few pipe piling under the Pulp Dock that are extensively cracked and broken (see photos PD10 and PD11) possibly from water freezing and expanding within them.

The concrete deck and caps are in fair condition; however, there is extensive cracking near the outer face of the Pulp Dock, probably due to ship impacts. Efflorescence or other products of water leaching through cracks in the concrete are visible from the underside of the structures.

There is a continuous concrete retaining wall along the back of both docks. The walls are supported by H-piling which are cast into plinths. The walls appear to be in good condition except that undermining of the wall (see photo PD1) from wave action exists in a few locations at the Pulp Dock. Previous attempts to arrest this process included the installation of concrete mats which have in turn been undermined (see photo PD2). The south eight to ten plinths at the Pulp Dock are delaminating at the corners (see photo PD4). These have the most severe exposure, which probably explains why the problem is confined to this area.

We found three sections of the Utility Dock deck which have been severely damaged, probably by a large load being dropped (see photo UD2). The area is near the back of the dock just outboard of the retaining wall. In each case the underside of the deck is heavily spalled, exposing and bending the steel reinforcement, in one location actually perforating the deck (see photo UD1). The damage appears recent based on the lack of corrosion on the reinforcement.

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. Due to 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.

The concrete decks of both docks are in fair condition. The deck hardware, such as cleats and bollards (see photo PD5) in most cases need to be reworked. All of the bull rails need to be replaced (see photo PD6). Finally, neither dock has a fendering system.

Rail Barge Ramp

The Rail Barge Ramp is located immediately south of the Utility Dock. It is a hinged ramp with rails used to off load railroad cars from barges. The ramp is raised and lowered by a draw-works. The ramp is constructed from a series of parallel steel girders decked over with timber. The draw-works consist of two steel towers (braced frames), one on each side of the ramp. Wire rope attached to electric motor-driven winches do the lifting. The steel pile supported towers are in the water. The piling are reportedly in poor condition. There are also concrete counterweights on each of the towers.

There are two breasting dolphins that are part of this facility. They are both timber pile clusters. Many of the piling in both dolphins are broken or have extensive marine borer damage.

A TrackMobile brand car mover (a small yard tug) is still onsite and was used to load and off-load rail cars.

Sheet Pile Cells

There is a 250-foot line of circular sheet-pile cells northeast of the Utility Dock, apparently constructed to retain dredging between the Sawmill Creek diversion dike and Silver Bay. The cells do not have cathodic protection and are badly corroded. The cells at the south end have collapsed, and the ones immediately to the north of those are beginning to lean.

GENERAL UTILITIES EVALUATION

The Electrical distribution system that served the Alaska Pulp Corporation site has mostly been demolished. At one time the AAC had the capacity of 23 MW of power generated at the power