

# DESIGN MEMORANDUM

January 17, 2018

**Project:** River Street Wharf Clean-up

**Location:** River Street Warehouse Wharf, 1300 N. River Street, Portland, Oregon 97227

**To:** Jerry Wade, E-mail: wade1109@msn.com

**From:** Robert B. Bittner, P.E.

Bittner-Shen Consulting Engineers, Inc.

921 SW Washington Street, Suite 765

Portland, Oregon 97205

**Background Information:** Due to a fire which destroyed the elevated warehouse structure sitting on top of the wharf at the above address in May of 2017, it was determined that the entire wharf area required clean-up and disposal of the burned structural debris which had been contaminated with fire related asbestos.

During the initial planning of the clean-up effort, the first step was to develop clean-up methods and procedure. There were three (3) primary criteria for the fire clean-up effort:

- 1.) **Safety** – The methods and equipment used to perform the clean-up must not endanger the safety of the clean-up workers.
- 2.) **Containment** – The methods and equipment should where ever possible minimize the further spreading of hazardous material into the air, water and ground, and
- 3.) **Efficiency** – The methods and equipment should be selected to minimize the cost and time required for the clean-up effort.

Early in the planning for the cleanup effort, one of the first option considered was to perform some of the cleanup effort from the water side using floating equipment. This concept included positioning floats below the deck and between the timber support piles in order to catch falling debris. However, after the inspection performed by Robert Bittner on July 12, 2017 it was determined that this was not a reasonable or safe approach for the following reasons:

1. The damaged deck above, and fire damaged condition of the piles made it unsafe to position personnel below the deck.
2. The piles spacing of 10-8 feet of the timber piles did not provide sufficient clearance to maneuver below the deck.
3. Cross bracing of the piles at the water level prevented the movement of floats or boats in both directions.
4. Horizontal pile caps used for pile splicing at the water line blocked access for boat or other floating equipment.

(Photographs 1,2,3,4 illustrate these points)



**PHOTO NO. 1:**



**PHOTO NO. 2:**



**PHOTO NO. 3:**



**PHOTO NO. 4:**

In order to meet the primary criteria listed previously it was determined that the safest approach would be to use mechanical equipment (cranes and long-reach backhoes) operating from the top of two temporary access trestles centered on and elevated above the burnt deck. Therefore, a plan was developed to perform all of the clean-up effort from above, using two temporary access trestles designed to support a 150-ton capacity crawler crane and a long reach backhoe. The two trestles were designed using 24" diameter pipe piles without support from any of the existing timber piles.

During the initial design stage for the access trestles, an inspection of the timber piles under the existing wharf was conducted on July 12, 2017 to determine if the existing timber piles could be used in the temporary access trestles to partially support the mechanical equipment. As a result of this initial inspection it was determined that due to the extent of both fire damage and timber rot, the existing timber piles could not be depended on to support the cranes or long-reach backhoes.

See attached photos No. 5 through No. 10 of the fire damaged wharf.

## Observations:

The condition and reliability of the existing timber piles is highly questionable for the reasons cited and documented in Inspection Report No 1, dated July 14, 2017. (See attached copy as addendum to this report.)

On December 15th, additional photos were taken of the area just to the North or downstream of Trestle A. In this area, portions of the deck and stringers had been removed and it was possible to view the conditions of the piles and pile caps below the deck. See attached photos No. 5 through No. 10. As can be observed from these photos, that there are several areas where piles had been either burned or rotted completely through from below.

PHOTO No. 5 also shows the long-reach backhoe in the process of removing deck. As can be seen in this photo, the deck is essentially ripped off the timber caps without the aid or assistance of personnel having to work out on the unsafe fire damaged deck area or below the wharf deck. In areas where the timber piles and caps have been undamaged by fire or existing rot, it is possible to remove the deck and fire damaged debris and leave behind the existing timber piles and caps. However, as can be seen from these 7 photos, the in-place condition and value of the remaining timber piles and caps is highly questionable.



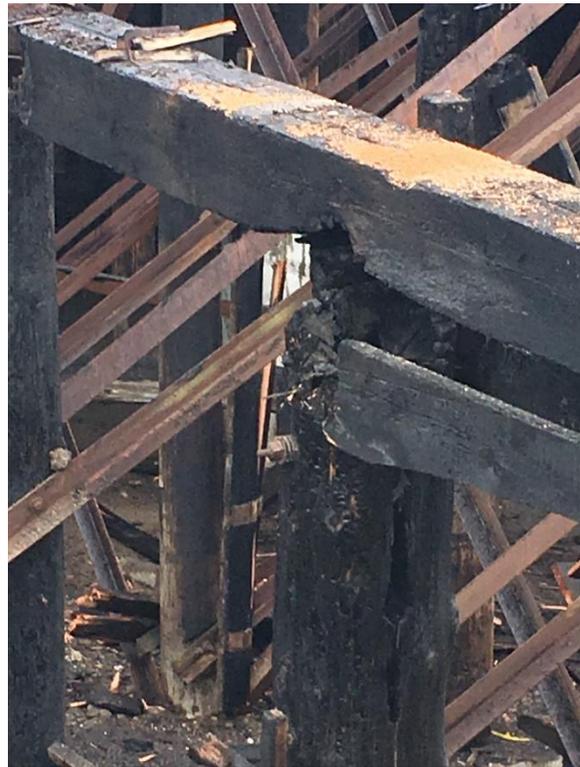
**PHOTO NO. 5-** Wharf area downstream of Access Trestle A with timber deck and stringers removed, exposing fire damaged piles and caps below.



**PHOTO NO. 6:** Fire damaged pile cap with pile remaining.



**PHOTO NO. 7:** Fire damaged piles and cap



**PHOTO NO. 8:** Fire damaged pile top below existing pile cap.



**PHOTO NO. 9:** Fire damaged pile with cap still in place above.



**PHOTO NO. 10:** Cap and stringers in place, but fired damaged pile below

## **ADDENDUM**

# INSPECTION REPORT

## NO. 1

**Location:** River Street Warehouse Wharf, 1300 N. River Street, Portland, Oregon 97227

**Date of Inspection:** July 13, 2017

**Report Date:** July 14, 2017

**Inspection by:** Robert B. Bittner, P.E.

Bittner-Shen Consulting Engineers, Inc.

921 SW Washington Street, Suite 765

Portland, Oregon 97205

**Background Information:** Due to a fire which destroyed the elevated warehouse structure sitting on top of the wharf at the above address in May of 2017, it was determined that the entire wharf area required cleaning and disposal of the burned structural debris. For the purpose of accessing the site, a conceptual design of two temporary access trestles was developed by Bittner-Shen Consulting Engineers, Inc. (BSCE). (See attached two drawings illustrating the concept design for temporary the trestle.) The purpose of the trestles will be to support an American 7250 crawler crane during construction of the trestles and clean-up operation. The trestles would also be used to support transport trucks for disposal of the wood debris. This crane has a total weight of approximately 136,000 lbs when operating with extended tracks and 100 feet of boom. The conceptual design of the trestle was based on using the existing timber piles plus added timber piles to support the crane and the fully loaded disposal trucks.

**Purpose of Inspection:** The primary purpose of the inspection was to confirm the adequacy of the existing timber piles along the path of the planned temporary trestle to partially support both the crane and loaded disposal trucks.

### Observations:

The condition of the existing timber piles is highly questionable for the following reasons:

- Approximately 30% of the tops of the existing piles in the first 6 rows closest to shore are completely destroyed by the fire.
- Approximately 90% of the remaining piles have been modified by cutting off the upper 20 to 30-ft at the ground line and splicing on a fresh upper section. Upper piles sections look sound, but bottom sections are either unexposed for inspection or where exposed, they can be seen to be in an advanced stage of decay. (See photos #2, #3, and #5.)
- The upper sections are held in place by two steel straps bolted above and below the splice at the ground line. (See attached photos #2, #3, #6 and #7)

- A significant number of the splice points are out of site below the ground and cannot be inspected because they are buried. However, the straps are visible and indicate a splice below the ground.
- There is significant rot at some of the pile stubs at the mud line (on the lower original piles). (See attached photos #4, #5, and #7.)



Photo # 1 - Side view of wharf from upstream side



Photo #2 – Typical pile splice at waterline



Photo #3 – Typical pile splice at waterline



Photo #4 – Completely rotted pile



Photo #5 – Typical pile rot at waterline



Photo #6 – Typical pile bent on shore with pile splice hidden below ground, but straps indicate that the pile has been spliced. It is assumed that the concrete blocks shown in this photo encase pile splice joints.



Photo #7 – Pile bent at waterline with straps exposed to indicate piles have been spliced.  
Note rotted pile in upper right area of photo.

Based on this information collected from the existing wharf inspection, it is concluded that the existing timber piles cannot be depended on to safely provided added support capacity for the temporary access trestles, and new piles should be installed for the temporary trestle support.

The recommended piles for this temporary support are open ended 24-inch diameter by 0.375-inch wall pipe piles. Using soil boring information from the adjacent Fremont Bridge foundations, these pipe piles will require a penetration of approximately 50 feet.

Submitted by



Robert Bittner, P.E.

Bittner-Shen Consulting Engineers, Inc.