

# SECTION OF RIVERWALK NEEDS \$3.8M REPAIR - CITY COUNCIL WILL REVIEW CONTRACT AMENDMENT, BUT THOMAS & HUTTON AGREE TO COVER FULL COST OF STABILIZATION WORK

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Publication: Savannah Morning News (GA) Page: 1A Word Count: 1081

A 448-foot section of the riverwalk along the Savannah River Landing site has structural problems that will require a \$3.8 million fix.

It is the second structural issue with the riverwalk's bulkhead in less than two years, and this time, the Savannah design and engineering firm of Thomas & Hutton has told city officials it will work with its insurance company to pay for the repairs, even if they exceed the initial estimate.

In exchange, both the city and its contractor, the construction firm TIC, will agree not to seek any claims stemming from the suspension of work and the repairs of the failed section.

Sam McCachern, senior vice president of Thomas & Hutton, said it was important to do the right thing, not only to maintain the firm's good relationship with the city but also to avoid exposing taxpayers to any financial burden.

"We as a company and a profession spend a lot of time talking about integrity, and now is one of those times to practice what we preach," he said.

City Council members are being asked to vote on the contract amendment at Thursday's meeting, but they already have questions. They were briefed on the situation two weeks ago and have hired an independent consulting engineer to represent the city's interests. At the direction of council, Alderman Larry Stuber, the retired founder and CEO of EMC Engineering Services Inc., has prepared more than 25 questions about the structural failure and the proposed rebuild. The consultant is expected to report to the council Thursday.

"The project is 2,100 feet long," Stuber said. "The fix is for 448 feet of the worst stretch. The question for the council is what about the rest of it? What is the condition of the other 1,652 feet? Someone has to tell us that professionally."

Engineers have been monitoring the riverwalk and the supporting bulkhead for nearly a year, McCachern said. Their geological technical expert and the city's agree the soil conditions that caused the second structural failure have stabilized and should not pose ongoing problems for the repair section or the rest of the riverwalk.

"Concrete is not very forgiving," McCachern said. "If we were having issues at some other point, cracks would have surfaced by now."

NEEDING ANSWERS

Other council members say the discussion that comes Thursday will be critical for them.

"I'm very concerned about the condition of the riverwalk and the circumstances about how all of this came about," Alderman Tony Thomas said. "Before I would vote on anything, I would have to have all of those questions answered. A substantial portion failed before it ever opened.

What does that say about the safety of the portion that hasn't even opened?"

Said Alderman Van Johnson: "We're talking about very, very complex engineering and technical issues. I need it to be broken down in layman's terms so I can understand what's going on and communicate it to my constituents. It needs to be made crystal clear."

Construction of the riverwalk and a floating dock cost about \$10 million. State funds, including a \$1 million grant, paid for \$9 million in construction. In August 2008, City Council approved a \$1.2 million change order to Thomas & Hutton when the bulkhead became unstable.

In that situation, contractors discovered submerged wooden pilings and sections of an old dock buried deep in the muddy silt in the riverbed. An 8-foot layer of wood was removed, but it changed the height of the wall's exposed face, said Charlie George, head of the structural department for Thomas & Hutton. As dirt was piled behind that wall as backfill, that exerted more force than the higher wall could handle. Over time, the top of the wall began leaning toward the river.

The change order paid for tiebacks to pull the top of the wall back in line.

## UNSTABLE SOIL

The submerged wood also created a barrier in getting a soil sample at the 448-foot section of bulkhead.

In the early design phase, Thomas & Hutton hired a geotechnical firm to bore into the soil and determine subsurface conditions for construction of the bulkhead and riverwalk.

Most of the riverbed is muddy silt, but at lower levels, a more stable strata of sand was found, George said. Savannah, particularly along a river, doesn't have layers of bedrock to provide anchor, he said.

In this particular location, the soil experts could not take a boring at the exact site where the bulkhead would go because of the submerged wood. They took seven borings at either side along the riverwalk and provided a report that showed what kinds of soils could be found at what depths.

New borings were not ordered after the wood was removed because engineers had no reason to

suspect the adjacent borings would be substantially different, George said.

Forty-foot-long steel sheet pilings were driven into the riverbed. A concrete foundation for the walkway rests atop the bulkhead, resembling a capital T in a cross-section view. On the river side, rip rap was piled against the base of the bulkhead. On the landward side, dirt was placed behind the bulkhead.

Sometime around last May, the new problem arose. This time, the top of the bulkhead seemed to be moving toward land. As engineers began investigating, they determined the base of the sheet piling below was not anchored in the more stable layer of sand. Pressure from the backfill was pushing against the lower portion of the bulkhead, which tilted the upper portion toward land.

Determining the cause and settling on the most appropriate solution has taken nearly a year, McCachern said.

If the council gives its approval, a new bulkhead will be built between the failing section of bulkhead and land. This time, sections of piling 60-feet long will be driven down into the river to a more stable layer of soil.

Engineers decided against removing the existing sheet piling, McCachern said, because that posed the threat of the riprap tumbling into the cavity created by the removed wall.

Stuber understands the unknown factors Thomas & Hutton faced.

"It's an engineer's worst nightmare for something like this to happen," he said. "I feel for everybody involved, but we've got to figure something out."

Photos by Richard Burkhart/Savannah Morning News (1) Concrete along the land side of the Riverwalk has begun to crack and collapse as the unstable support sheet pilings move. (2) Dirt has been dug away to expose and take some of the pressure off the sheet pilings along the Riverwalk. (3) The pilings supporting the Riverwalk extension are shifting, causing damage to the walkway above.

SITE OF SAVANNAH RIVER LANDING

**Date:** May 18, 2010

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