

COUNTY OF YORK

MEMORANDUM

DATE: July 1, 2022
TO: York County Board of Supervisors
FROM: Neil A. Morgan, County Administrator
SUBJECT: Riverwalk Landing Parking Terrace



Staff engaged the services of W. M. Jordan Company, the Design/Build Contractor that built the parking terrace in 2004, to help determine what caused the cracking of the post-tensioned concrete beam that was discovered on May 18th and how to best correct the issue. W. M. Jordan was able to bring in the subcontractor that performed the actual construction of the concrete beam (Century Concrete) and the engineers from Speight, Marshall, and Francis (SMF), who were the Structural Engineers of Record for the project, to help with their investigation.

In addition to the contractor, the staff hired Lynch Mykins Structural Engineers (LM) to perform an independent investigation to determine several things, including how much of the parking structure could safely remain open to the public; the adequacy of the temporary shoring measures; and recommendations for moving forward with a repair. Following the guidance of Lynch Mykins, given after they had performed their initial investigation, it was decided to keep all traffic off the upper deck of the structure, but a significant portion of the lower deck was opened back up to the public.

At this point, the costs incurred by the County for this project consist of one month of barricade rental (\$3,150), the investigation and preliminary report by LM (\$2,070), and the materials for the temporary shoring (~\$500). The W. M. Jordan Team has not yet invoiced for their work of removing the concrete from the beam and the investigation and engineering study work performed by SMF. The status of an insurance claim is currently unknown but is expected to be ascertained in the coming weeks as the final repair is determined and quantified.

On June 2nd, Lynch Mykins issued their preliminary report based on their site investigation and the design drawings. The report detailed that it would be necessary to remove additional concrete from the beam to determine the exact nature and cause of failure along with the resulting corrective measures. The W.M. Jordan team began removing concrete from approximately eight feet of the bottom of the beam on June 20th and exposed the 24 post-tensioned tendons along with the bottom reinforcing bars.

Once the concrete cover was removed, it became evident that the tendons were not correctly placed before the concrete placement. For a span of approximately 40 inches along the beam, the tendons must not have been restrained or supported sufficiently to keep them from “drooping” a little more than an inch out of the expected parabolic curve. This 40-inch area is where the cracking of the concrete occurred. This lack of restraint or

support resulted in a slight hump in the tendons. When the tendons were tensioned, this slight hump caused the tendons to exert a downward force on the beam instead of the intended upward force.

Because this 40-inch span with the hump in the tendons occurs at the mid-span of the beam, where the tendons are at their lowest point in the beam, there was only an inch or two of concrete to resist the downward force. It is speculated that over time, the dynamic nature of the concrete upper deck slowly eliminated the concrete's ability to resist the downward force from the tendons, resulting in the cracked concrete.

The Structural Engineers have communicated to staff that there are no structural concerns and that the capacity of the beam is still more than sufficient to support the loads. The repair is expected to consist of replacing the concrete removed from the bottom of the beam with a cementitious material that will protect the steel elements from moisture. The repair will also be cosmetic, returning the beam to its prior shape and color.

Based on the analysis described in this report, the County fully reopened the upper parking deck as of this date. It will be necessary to briefly close portions of the deck later this summer to implement the cosmetic repair once the details of that plan are established.

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