

Independent Expert Review of FIU Bridge Construction Accident Determines Multiple Construction Deficiencies

October 8, 2019, TALLAHASSEE, FL - Detailed research and analysis conducted by preeminent forensic structural engineering experts Wiss, Janney, Elstner Associates (WJE) determined that the pedestrian bridge construction accident at Florida International University resulted from a failure by contractors to conform to the final bridge design plans and comply with State of Florida construction requirements. The WJE analysis was included in FIGG Bridge Engineers' submission to the National Transportation Safety Board as part of the investigation of the March 15, 2018, accident.

WJE concluded that the fundamental cause of the collapse was the failure of contractors to properly construct structural connections at the north end of the bridge. If the appropriate sections of the bridge had been properly fabricated, according to WJE, "the collapse would not have occurred." A similar finding that the construction joints were not roughened in accordance with state standards was reached in an analysis conducted by the Turner-Fairbank Highway Research Center for the Federal Highway Administration for the National Transportation Safety Board.

"The events of March 15, 2018, were, by any measure, a tragedy. However, contrary to incomplete prior accident updates, the design of the UniversityCity Pedestrian Bridge at Florida International University was neither the proximate cause, nor a contributing cause, of the construction accident," the submission says. "If, however, the various parties constructing the bridge, inspecting the construction, or moving the bridge into position, fail to comply with (plans, specifications, and requirements), then even a safe design will be compromised."

WJE was commissioned by FIGG to conduct a thorough review of the circumstances leading up to the March 15, 2018, bridge construction accident. WJE is among the foremost experts in the field, and has investigated, tested, and repaired more than 125,000 projects involving almost every type of construction material and structural system. They worked with NTSB and the Federal Highway Administration to perform a detailed post-collapse inspection and failure investigation into the 2007 collapse of the I-35W Mississippi River Bridge in Minneapolis and assisted the NTSB in the investigation into the 1996 crash of TWA Flight 800. WJE also conducted a thorough investigation into the 1981 elevated walkway collapse at the Kansas City Hyatt Regency Hotel.

WJE focused on the installation of the concrete beneath bridge members 11 and 12, where the failure is believed to have occurred. The construction documents required that the concrete at that spot be "roughened" per Florida Department of Transportation Standard Specifications, which is part of the Released For Construction Plans. WJE conducted full-scale laboratory tests on an exact replica of the portions of the bridge that failed and found that the connection built with concrete roughened per the specifications would be 178% stronger than if the connection

was built with un-roughened concrete. Unfortunately, the connection was not roughened and therefore did not have the strength for which it was designed.

Key findings by Wiss, Janney, Elstner Associates in their report regarding the accident include:

- Full-scale testing showed that if the construction joints were prepared in accordance with specifications, the collapse would not have occurred.
- A “debonding and sliding failure” at the construction joint of members 11 and 12 led to the collapse.
- The construction joint specifications required by the Florida Department of Transportation were proven to achieve the requirements of the American Association of State Highway Transportation Officials design code.
- Bridge members 11 and 12 were designed in compliance with standards of the American Association of State Highway Transportation Officials Load and Resistance Factor Design (AASHTO LRFD).

The submission cites multiple instances where FIGG personnel, located 500 miles away in Tallahassee, were not advised by the contractor and inspectors on-site that cracks had expanded. The investigation also revealed that the main bridge span underwent significant twisting as it was moved into place five days before the accident. “At no time was FIGG made aware of the fact that during the move, the bridge was twisted in excess of allowable limits on multiple instances,” the submission says.

“Post-accident analysis of FIU construction web cam video shows that the cracks were not closely monitored during re-stressing as stipulated by FIGG and (a sub-contractor's) shop drawings, and that proper crack monitoring tools do not appear to have been in use. Had proper crack monitoring been performed, it is possible that a worsening condition could have been detected and the re-stressing operation halted before the accident occurred,” the submission states.

The factual details of the investigation and analysis of FIGG’s NTSB submission, including WJE’s full report, are provided in a 344-page document that can be found on FLBridgeFacts.com. This research and analysis in the report speak for themselves.

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