



Infrastructures Project Profile

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PROJECT: FTI-1-2012



Lincoln Tunnel Interchange



Before Repair: Typical Weld Line Crack



After Repair: StopCrackEX Installed

<u>Application:</u>	FTI StopCrackEX
<u>Customer:</u>	New Jersey Turnpike Authority (NJTA) Oversight by HNTB
<u>Project Date:</u>	March 9, 2012
<u>Project Location:</u>	Milepost E.112.95A, Interchange 17 RAMP NET (A) New Jersey Turnpike Lincoln Tunnel Interchange
<u>Project Status:</u>	Open

Project Description

Fatigue Technology (FTI) was contacted by HNTB on behalf of the New Jersey Turnpike Authority (NJTA) to apply the FTI StopCrackEX process adjacent to cracks running along weld connections that join the flange to webs of typical floorbeams. The aim of the project was to compare the effectiveness of typical crack arrest holes (CAH) against StopCrackEX.

Six cracks were identified at Milepost E.112.95A, Interchange 17 – Ramp NET (A) on the New Jersey Turnpike, (Lincoln Tunnel interchange). All cracks were identified as out-of-plane bending cracks. Typical CAH, drilled centered on the crack tip directly into the weld material, had proven to not arrest the growth of the crack.

General Comments

The objective of this task was to drill a standard 1.0 inch CAH at one end of the crack and the FTI StopCrackEX method at the other end of the crack. The StopCrackEX was installed with the center of the ½” diameter StopCrackEX hole displaced ¾” below the flange and ¼” ahead of the visible crack tip, clear of the weld material. The resultant residual compressive stress induced by the process provides a crack closure effect at the crack tip which retards the growth of the crack. The procedure followed was detailed in the “Structural Steel Repair Details and Maintenance and Protection of Traffic, Change of Plan No. 6” issued by NJTA.

The effectiveness of this method has been shown in the laboratory to be at least a 3:1 improvement in crack growth life compared to the conventional CAH configuration.

The task was completed in one day. Drilling the CAH was more difficult because of the hard weld material and the drill bit was being pushed away from the flange by the weld. The StopCrackEX hole was smaller, faster, and easier to drill away from the heat affected zone of the weld.

<u>Current Status:</u>	Cracks will be monitored for the next 6-12 months
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