Ohio Department of Transportation

Fracture Critical Member and Fatigue Prone Connection Identification Plan

Reference: ODOT Manual of Bridge Inspection Chapter 4 & Appendix E

District:	12
County-Route-SLM	CUY-006-1456
Structural File Number:	1800930
Fatigue Life Study:	Year of Study ___N/A____ Remaining Fatigue Life ___N/A___
Load Path Redundant:	No, structure is fracture critical, inspect FCM's every 24 months
Structurally Redundant:	No, acts as simple span
Internally Redundant:	Yes/No, some built up riveted members present
System Redundant:	Analysis has not been performed to determine

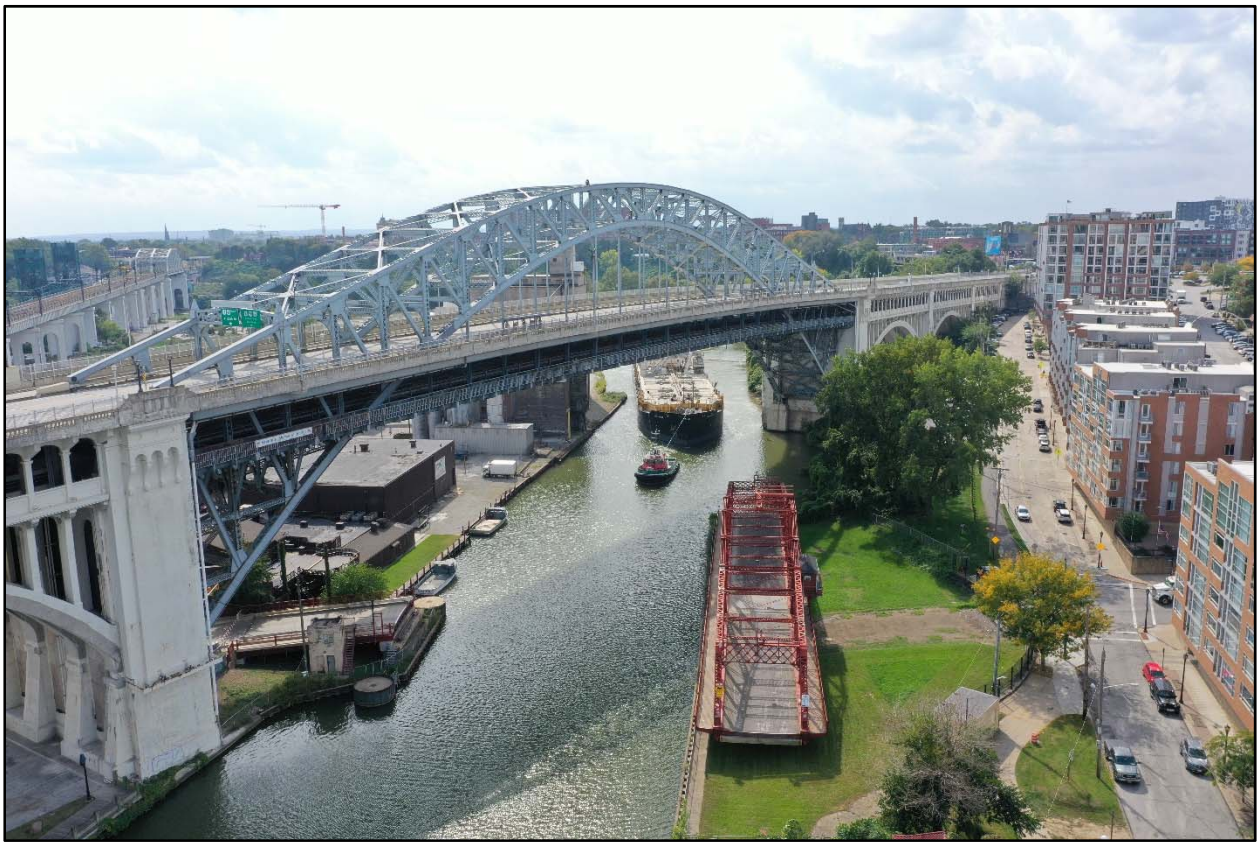

Figure 1: CUY-6-1456 over the Cuyahoga River

Location: The CUY-6-1456 Bridge (Veterans Memorial/Detroit-Superior Bridge) carries three lanes of vehicular traffic and one lane of bike traffic over the Cuyahoga River Valley, local streets, and RTA railroad tracks, in Cleveland, OH.

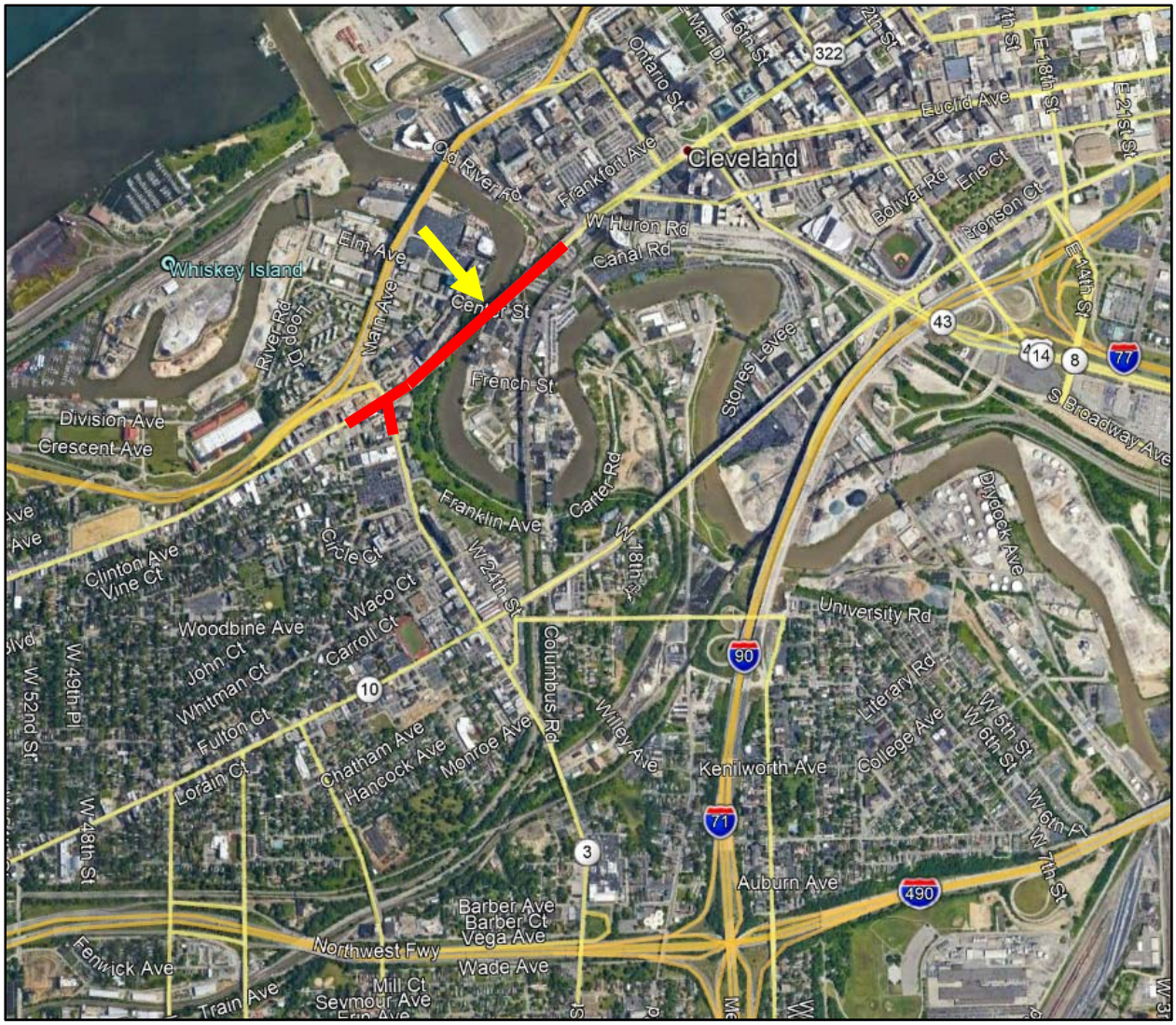

Figure 2: CUY-6-1456 in Cleveland over the Cuyahoga River

Description: The bridge is approximately 2,880 feet long, including 1,673 feet of subway tunnel that is linked by the lower deck. The bridge was constructed from 1912 to 1917. The majority of the main spans are reinforced concrete deck arches. Span 4 is a 591-foot long, three-hinged steel half through arch truss in a Pratt configuration. In this steel arch span, portions of the arch truss, pins, hangers, upper deck floorbeams and upper deck overhang brackets are considered fracture critical (see *Figures 3 & 4*).

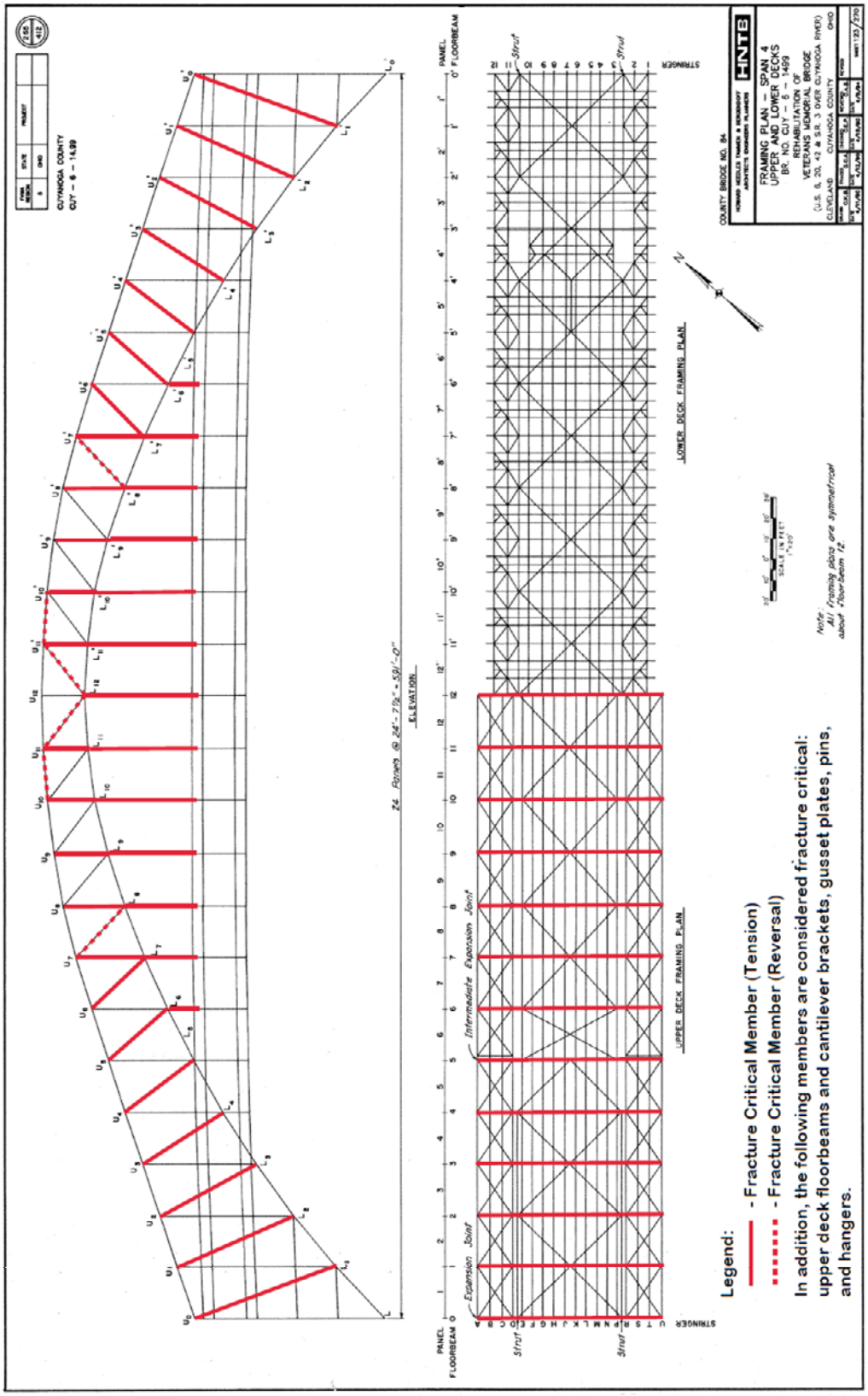

Figure 3: Fracture Critical Member Locations (Highlighted Red)

Fracture Critical Member and Fatigue Prone Connection Identification Plan

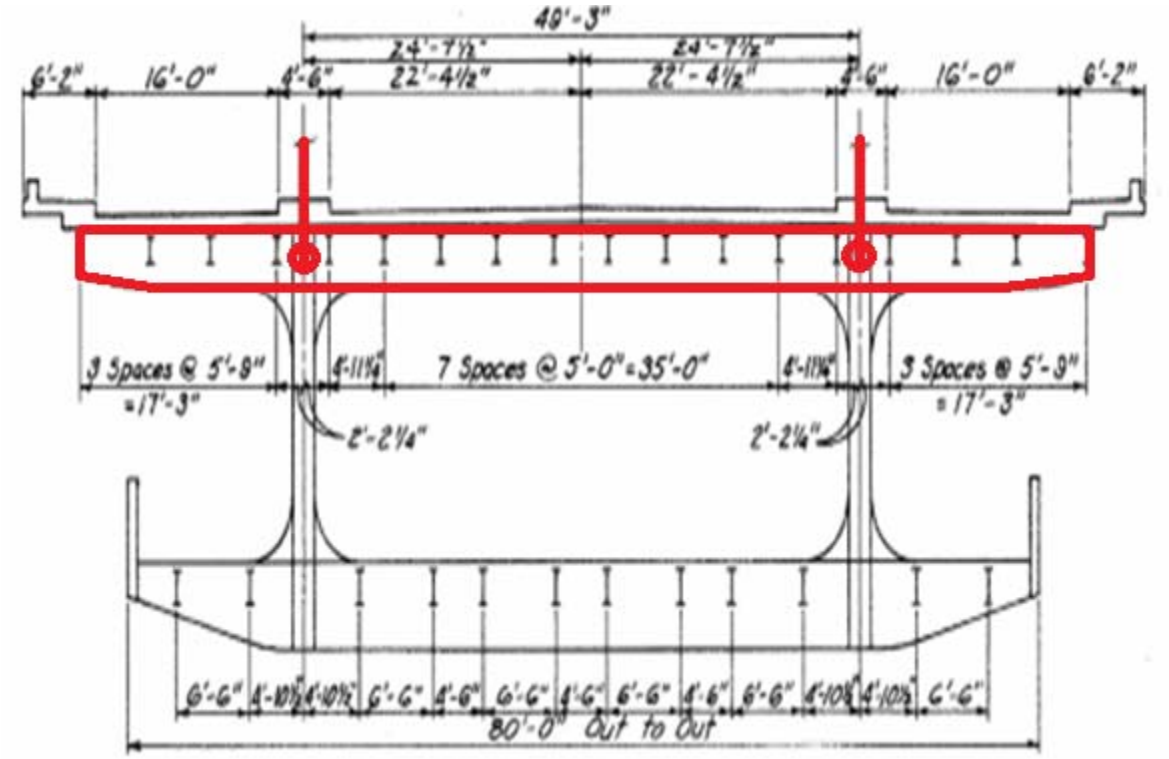

Figure 4: Fracture Critical Member Locations (Highlighted Red)

FCM Access: A combination of aerial work platform, ladder and climbing techniques were used in previous inspections to achieve arms' length inspection. Alternate techniques to those described below may be employed at the discretion of the inspection team.

Aerial Work Platform / Ladder: 40' straight boom unit placed on lower (maintenance) deck to access upper deck floorbeams, cantilever brackets, and lower pins. This work is assisted with a 24' ladder, placed on the exterior walkways, in areas of utility conflict.

Climbing Techniques: All portions of the arch truss, hangers, pins, and gusset plates.

Known Structural Risk Factors & Fatigue Prone Details

Category reference: AASHTO LRFD Bridge Design Specs, 9th Ed. Table 6.6.1.2.3-1

Photo Reference	Label / Fatigue Category	Where?	Description
1a, 1b	Top Flange Stiffening Plate Retrofit, Fatigue Category E	Lower Deck Floorbeams	Fillet welds connecting top flange stiffening plate retrofits to existing top flange plates at truss lines. Fillet welds have cracked at several locations. No propagation into base metal noted.

*Blank cells are for inspectors to add FPD's, retrofits or fatigue crack locations in future inspections

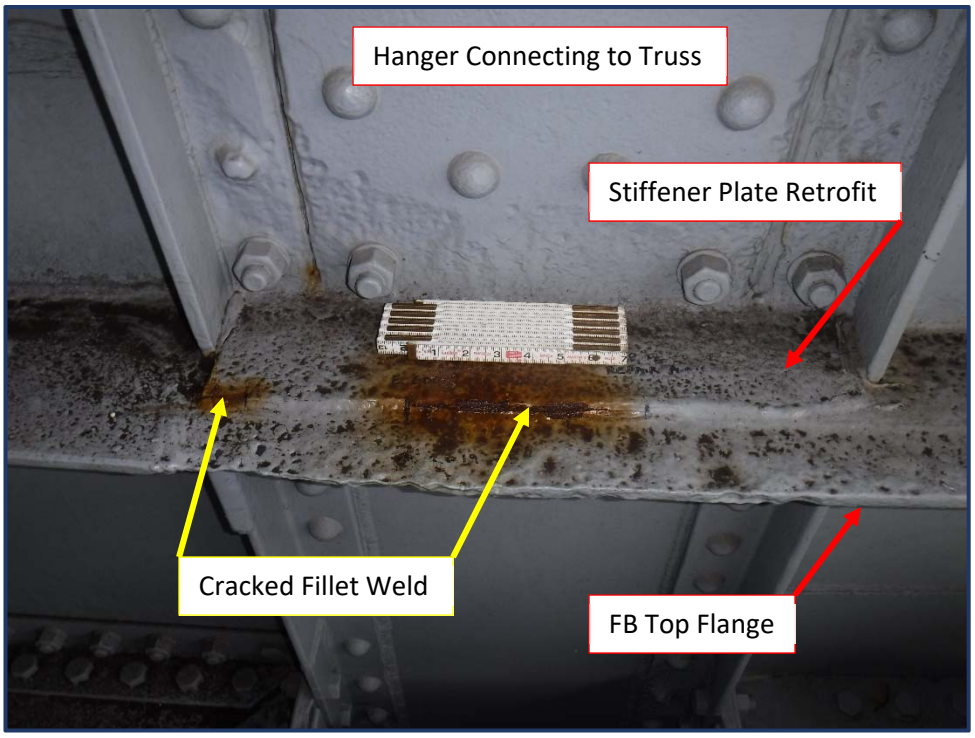

Photo 1a – Cracking at Lower Deck Floorbeam Stiffener Plate Retrofit

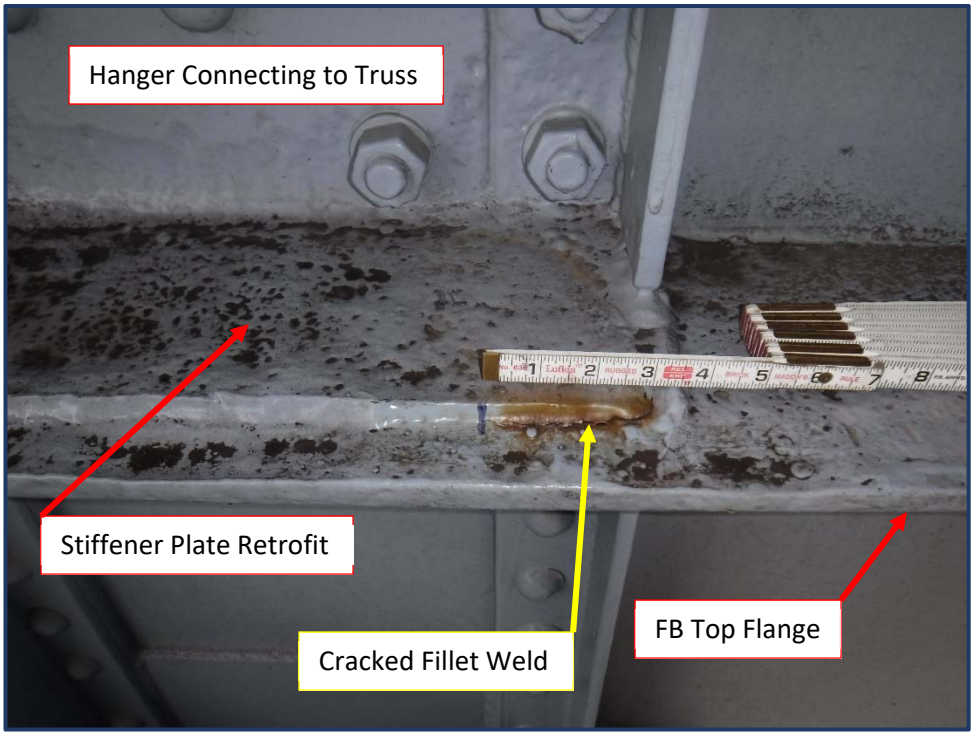

Photo 1b – Cracking at Lower Deck Floorbeam Stiffener Plate Retrofit