

Memorandum



CITY OF DALLAS

DATE June 29, 2018

TO Honorable Mayor and Members of the City Council

SUBJECT Margaret McDermott Bridge Status Update

This memorandum provides an update on the status of the Margaret McDermott (IH30) Bridge project. The City has been working with TxDOT and the Engineer of Record (Huitt-Zollars) towards a path forward to complete the bridge construction and safely open it to pedestrian and bicycle use.

City engineers, along with TxDOT engineers, have been reviewing the summary letter provided on May 25, 2018 by the Engineer of Record (see attached). The summary letter provided indicated that the cable anchorage system has failed to perform as originally designed and intended, the remedies to date have failed to remedy the vibrations, and prior vibrations have subjected the elements to premature fatigue. The letter suggests two different cable system retrofit alternatives which *may* resolve the vibration and fatigue issues associated with the cable anchorage system; however, there was no recommendation made concerning either proposal.

Since the City received the letter, we have met with the Engineer of Record several times including June 5, 2018, June 12, 2018, teleconference on June 21, 2018 and on June 28, 2018 to gain greater clarity on what has been proposed. From these efforts, it is clear that the two alternatives require additional testing to verify that the solution will resolve the identified issues prior to full implementation. Not only will this further delay completion, it raises the possibility that either of the suggested proposals may fail the testing as well.

This could potentially continue the delays we have experienced and more solutions may need to be explored. Attached you will find the City's most recent correspondence from June 25, 2018. Additionally, staff continues to consult with the City Attorney's Office to advise on appropriate next steps from the City's perspective.

Please let me know if you have any questions.

A handwritten signature in black ink, appearing to read 'T.C. Broadnax'.

T.C. Broadnax
City Manager

Attachment

DATE June 29, 2018

SUBJECT Margaret McDermott Bridge Status

c: Larry Casto, City Attorney
Craig D. Kinton, City Auditor
Billerae Johnson, City Secretary
Daniel F. Solis, Administrative Judge
Kimberly Bizer Tolbert, Chief of Staff to the City Manager
Majed A. Al-Ghafry, Assistant City Manager
Jon Fortune, Assistant City Manager

Joey Zapata, Assistant City Manager
M. Elizabeth Reich, Chief Financial Officer
Nadia Chandler Hardy, Chief of Community Services
Raquel Favela, Chief of Economic Development & Neighborhood Services
Theresa O'Donnell, Chief of Resilience
Directors and Assistant Directors



City of Dallas

June 25, 2018

Charles Quade, P.E.
Vice President
Huitt-Zollars, Inc.
1717 McKinney Avenue
Suite 1400
Dallas, Texas 75202-1236

Re: IH 30 Pedestrian Bridges over Trinity River
MMD Cable Anchorage System

Mr. Quade:

The City has received your letter dated May 25, 2018 (copy attached), summarizing the Huitt-Zollars' third party evaluation of the cable anchorage system of the subject project.

As summarized by your letter, the cable anchorage system has failed to perform as originally designed and intended, the remedies to date have failed to remedy the vibrations, and prior vibrations have subjected all of the elements to premature fatigue. The letter suggests two different cable system retrofit alternatives which *may* resolve the vibration and fatigue issues associated with the cable anchorage system. You do not make a recommendation as to either proposal.

The City has reviewed this letter, and has met with you, on May 25, 2018, June 5, 2018, June 12, 2018, and by teleconference on June 21, 2018 to gain greater clarity on what has been proposed. From these efforts, it is clear the two alternatives require additional testing to verify that the solution will resolve the ongoing identified issues prior to full implementation. Not only will this further delay completion, it raises the very real possibility that either of the suggested proposals will fail the testing, setting off another round of delays, searching for a different solution, more testing, and the possibility that the next proposed solution will also fail.

Additionally, the two suggestions appear to be inconsistent with the original design intent and level of future operation and maintenance that would be considered customary. The frequent inspection and potential replacement of cable dampers exposes the City to undue risks and financial burden. While the recommendation for additional cable dampers is expected to further suppress cable vibrations, it does not ensure the elimination of the cable vibrations. Therefore, the City has serious reservations concerning implementation of either of these alternatives.

We request any alternative solution in addition to what has been proposed, to improve the function of the structure to meet current industry standard performance, and to reduce the anticipated O&M requirements to be consistent with the normal anticipated bridge maintenance efforts for this type structure. Please expeditiously explore other options to address this current situation including, but not limited to shifting the primary load-bearing function from the cables to other bridge elements, replacing the cables, and other solutions as appropriate.

Please provide your recommendation for moving forward with the alternative with sufficient detail towards understanding a defined path towards implementation, with an order-of-magnitude estimate of probable cost, and an estimated schedule. We are requesting this response no later than end-of-business on July 6, 2018.

Please let me know if you have any questions.

Sincerely,



Sarah Standifer, Director
Trinity Watershed Management Department

c: T.C. Broadnax, City Manager
Kimberly Tolbert, Chief of Staff
Jo M. (Jody) Puckett Assistant City Manager (I)
Rick Galceran, P.E. Director, Public Works
Susan Alvarez, P.E., Assistant Director, Trinity Watershed Management
Haroon Abdoh, P.E., Senior Program Manager, Trinity Watershed Management
Mr. Ian Rowe, Chief Structural Engineer

May 25, 2018

Ms. Sarah Standifer
Trinity Watershed Management
City of Dallas
1500 Marilla, Suite 6B South
Dallas, Texas 75201

RE: IH 30 Pedestrian Bridges over Trinity River
MMD Cable Anchorage System
HZI Job No. 01-3251-41

Dear Ms. Standifer:

Summarized herein are the conclusions reached by the specialist independent third-party engineer hired by the Design Team. Based on their probabilistic fatigue life estimate (an estimate of how long the currently installed anchor rods can be predicted to function without a fatigue induced field failure), we developed two (2) alternatives for a path forward.

The third-party engineer's conclusions are based on their field investigations and evaluation of global bridge response analyses completed by Huitt-Zollars. Field investigations were conducted during the weeks of March 19-23, 2018 and April 30 – May 3, 2018. Conclusions provided by the third-party engineer are as follows:

- Cable's lower anchorage system, specifically the currently installed threaded anchor rods, do not provide industry standard reliability over the bridge's service life, i.e. the fatigue resistance of the anchor rod is lower than customary and therefore the predicted life cycle to failure / replacement is shorter than customary.
- While the existing damping system (as currently installed) dramatically reduces the vibrations, the anchor rods still remain vulnerable to fatigue and the vibration reduction (even to these micro levels) cannot extend the life of the anchor rods to a period that one would consider customarily acceptable.
- The third party engineers noted their last round of field measurements that the addition of one or two additional cable dampers further suppressed the vibrations.
- The referenced threaded anchor rods should be replaced with ones that provide adequate fatigue resistance.
- Reliability of a new lower anchorage system must be validated through laboratory testing and concurrent field monitoring prior to fabrication and installation.

In order to resolve the fatigue issue, the Design Team proposes installing one of two different cable system retrofit alternatives as outlined below. Each of these alternatives would be tested to prove that they provide adequate fatigue resistance by meeting or exceeding industry standard reliability tests for such bridge components over their service life.

Alternative 1 – Retrofit Existing Lower Anchorage

Maintain in place the existing upper anchorage, cable, dampers, and upper socket of the lower anchorage. Replace the lower anchorage system threaded anchor rod with a larger diameter rod and a new forked socket, attaching these components to the lower anchorage upper socket with a coupler.

Alternative 2 – Cable Assembly Replacement

Replace the entire cable assembly, including the upper anchorage, cable, and lower anchorage (incorporating a larger diameter threaded anchor rod at the lower anchorage). Remove and re-install existing dampers on the new cable assembly.

The above assumes that the selected alternatives be installed for all cables and includes an allowance for providing additional Stockbridge dampers as these were determined to be beneficial per the latest field testing.

Should you have any questions or comments, please contact me at your convenience.

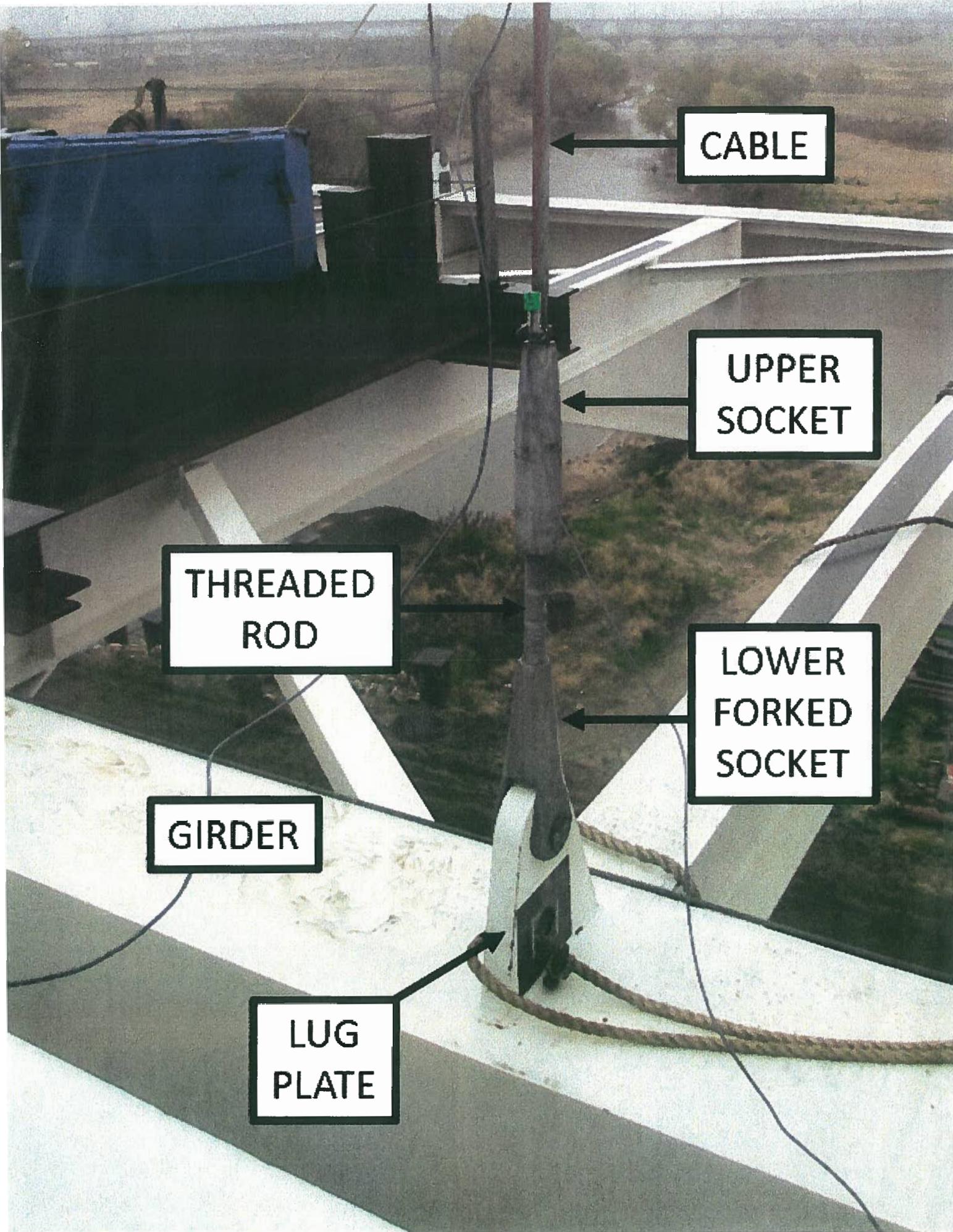
Sincerely,

HUITT-ZOLLARS, INC.



Charles E. Quade, P.E.
Vice President

CC: Mr. Iain Rowe Chief Structural Engineer (Santiago Calatrava LLC)
Ms. Susan Alvarez, P.E. Assistant Director Trinity Watershed Management (City of Dallas)
Mr. Haroon Abdoh, P.E. Project Manager Trinity Watershed Management (City of Dallas)



CABLE

UPPER
SOCKET

THREADED
ROD

LOWER
FORKED
SOCKET

GIRDER

LUG
PLATE