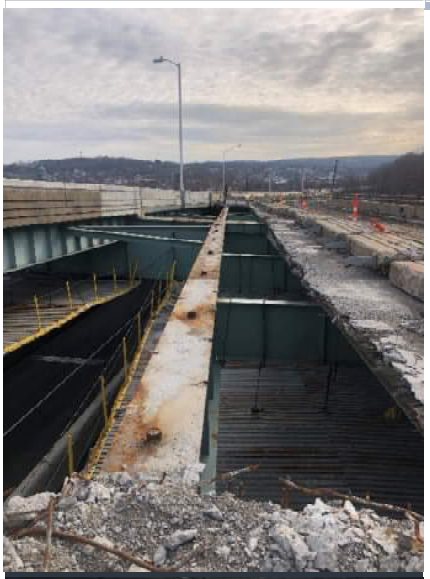
Mixmaster Rehabilitation NEWSLETTER

February 2021

this issue



Project Status

The Mixmaster Rehabilitation project is into its 28th month. A summary of recent activities include:

Route 8 Northbound (Bridge 3190A):
- Stage 1 decks/parapet formed and poured for Spans #30-36.
- Stage 2/3 deck forming from south to north.
- Demolition and reconstruction of bin wall along Route 8 Northbound is complete.

Route 8 Southbound (Bridge 3190B):
- Waterproofed and paved Spans #1-13 on October 15, 2020.
- Traffic shifted to the new Stage 1 deck on November 2, 2020.
- Demolition of Stage 2 deck is ongoing.

I-84 Eastbound (Bridge 3191A):
- Moveable barrier was installed and deck end reconstruction is underway along the right side of I-84 Eastbound.

I-84 Westbound (Bridge 3191B):
- I-84 Westbound left and auxiliary lane deck ends completed. Middle lane completed west of Exit 20.

I-84 Westbound (Bridge 3190D):
- Exit 19 re-opened on December 16, 2020.

Route 8 Southbound (Bridge 3191D):
- Exit 31 ramp currently in Stage 2 configuration with barrier limiting the width of travel.
- Bituminous wearing surface milled on December 1, 2020.
- Bridge rehabilitation is underway.

I-84 Westbound (Bridge 3191E):
- Exit 20 remains in Stage 1 configuration.
- Below deck work throughout includes Class S and steel repairs.

Route 8 Northbound (Bridge #3190F):
- Exit 33 closed on September 24, 2020.
- Bituminous wearing surface milled on December 1, 2020.
- Bridge rehabilitation is underway.

If you have any comments or concerns relative to this project, please feel free to contact us at info@mixmaster-rehab.com or visit our project website https://mixmaster-rehab.com/. All future updates will continue to be posted on all social media outlets.

An Interview with …..

Taryn Yopp

Document Control Specialist

GM2 Associates, Inc.

1. What is your role on this project?

My role on the Mixmaster Rehabilitation project is Document Control Specialist. This consists of maintaining all incoming and outgoing contract documents in SharePoint including coordination of submittal responses, RFIs (Request for Information), and PCOs (Potential Change Orders), and tracking the completion of requirements between the construction contractor and the field engineering staff. I also assist in the processing of change orders, supplemental agreements and extra work orders. In addition to maintaining and processing these contract documents, I also monitor the contractors' compliance with federal requirements related to Equal Employment Opportunity and wages.

2. What is your background and how did you become involved in Construction Engineering & Inspection projects?

I attended CCSU and earned my B.S. in Psychology with a minor in Criminal Justice. Like many college graduates, I had a degree and limited opportunity in the field I had initially chosen to pursue. A temporary position at a large engineering firm as administrative assistant opened the door to what would be my future career. I started out working on the CTFastrak project which fortunately provided me with many connections. I became interested in construction inspection and during this time was mentored by some really great engineers. This is what led to a change in focus. Once being in the field, I knew that construction was where I ultimately wanted to be. The I-84 Widening project was my next field project that afforded me in-depth knowledge of field work. My current position on the Mixmaster Rehabilitation is an ongoing learning experience and has given me a broader sense of heavy highway construction.

3. I understand that you are furthering your education and working towards your NICET certification, please tell us about that.

After working on the Mixmaster Rehabilitation project for about a year, I chose to further my education and pursue a certificate in Construction Management. With this additional education I am confident I will have the knowledge to pass my NICET. This certification will allow for growth and opportunity for me in the CE&I field, which I have come to enjoy and hope to excel in as an Assistant Office Engineer/Office Engineer.

4. To date, what was the most interesting part of the Mixmaster Rehabilitation project?

The most interesting part of this project thus far was the development of the temporary bypass. I got to see the transformation from pile driving all the way to the placement of the three temporary bridges. It is remarkable to see a design and implementation put into place to benefit the traveling public while the rehabilitation is taking place.

5. What advice would you give others contemplating a profession in Construction Management?

There are so many opportunities and roles within the construction industry. There will always be a need for construction, whether it be rehabilitation, new construction or a combination of both. Trades are also going to be highly needed in the near future. In Connecticut alone there are multiple options for trade schools, Community and State Colleges where you can get a great education without being in major debt. Other important roles in construction management are scheduling, design, inspection, estimating and project management. I have been fortunate to have peers and mentors in the industry that have motivated me and pushed me outside of my comfort zone. I look forward to completing my certificate in Construction Management this Spring and am excited to see where my career path takes me.

Looking Ahead: Spring 2021

Overview

I-84 was fully open to travel in 1968 with a 50 year design life. As defined by the American Association of State Highway and Transportation Officials (AASHTO), the "limit state" is a condition of a structure beyond which it no longer fulfills the relevant design criteria for strength, service, fatigue and failure and extreme event. A roadway or bridge's "service life" is significantly impacted by the live and dead loads applied to it.

With modification of the curb sections and parapet caps along with the addition of steel strengthening and refurbishment of the concrete substructure and superstructure, the Mixmaster has not reached its "limit state". Although new, wider structures are optimum, the costs and regional impact associated with such changes are frequently prohibitive. For the Mixmaster, the cost to extend the service life, adding moderate capacity improvements, was both economical and good for the community.

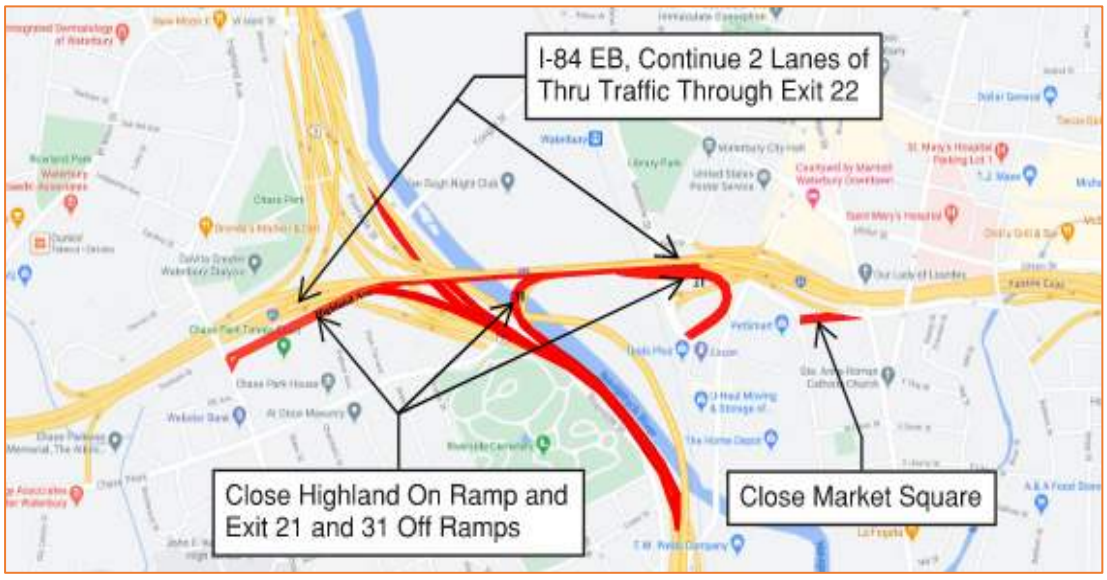
Restoration of the Mixmaster has its issues. It was Connecticut Department of Transportation's (CTDOT) plan to replace the Route 8 Northbound superstructure from the start; however, after performing a thorough inspection of Route 8 Southbound it was determined that full replacement of the Route 8 Southbound bridges was economically prudent as well. In doing so, CTDOT is confident we will meet the 25 year refurbishment goal for Route 8.

Other areas where CTDOT is looking to make improvements to extend the bridge's service life are the replacement of deck ends, joints and waterproofing, as well as areas where salt infiltration causes the most deterioration.

Possible Spring Closures/Road Impacts

To mitigate schedule impacts associated with the Mixmaster Rehabilitation work and to ensure worker safety, CTDOT is deciding on ***potential*** closures and traffic shifts in the near future. These ***may*** include:

- I-84 Eastbound, the two-lane configuration will continue through Exit 22, South Main Street. Currently I-84 Eastbound opens up into three lanes once you pass the Highland Avenue on-ramp. If we move forward with this change, it will allow unrestricted and safe access to the work and improve quality by reducing "construction joints" that often lead to structure deterioration.
- Closure of Highland Avenue on-ramp (in an effort to reduce traffic tie-ups along I-84 Eastbound caused by traffic weaves through the work zone). If this closure happens, traffic will be directed to Exit 18, Chase Parkway on-ramp.
- Closure of Exit 31 (Off-ramp from Route 8 Northbound to I-84 Eastbound. Traffic would be redirected to the Exit 35 U-turn, then to the Route 8 Southbound, Exit 31 off-ramp to I-84 Eastbound.
- Closure of Exit 21 off-ramp to Meadow Street. Local traffic would be directed to Exit 22, South Main Street.
- Closure of Market Square: This would allow for improved traffic flow at the Exit 22, South Main Street intersection. With this potential temporary closure, the signal at the bottom of the Exit 21 off-ramp would be eliminated and the signal timing at South Main Street adjusted. Local traffic access to I-84 Eastbound from Meadow Street would not change. As the result, local traffic impacts would be minimized.
- Traffic signal timing may change at other intersections to help improve traffic flows associates with the potential detours.



Replacement of Bridge Deck Ends

When driving across large bridges, you often notice a rhythmic tire thump every 2 to 4 seconds. These thumps (when not potholes) are typically the sound of your tire passing over a bridge joint. Bridges are built in sections for several reasons related to design, constructability and proper bridge function and an area that often requires repair. The bridge joint is where all the expansion and contraction happens and where the bridge is allowed to move and absorb repetitive traffic loads without cracking or failure.

A significant portion of the work at the Mixmaster involves replacement of the bridge joints and work related to bridge joint failure including replacement of bridge bearings, restoring deteriorated steel members exposed to sand and salt and beam end painting.

Rehabilitation of these deck ends, while attempting to maintain traffic is a difficult task. To achieve a lasting repair, the Engineering Team looks to reduce construction joints and seams that allow for water infiltration. The CTDOT considers these issues, along with the financial costs and traffic impacts when making every decision. Significant thought goes into the staging of work, the movement of traffic and the impact of those decisions of the contractor's schedule.

This article will detail the sequential efforts required to complete the deck end, followed by a description of the efforts made to complete this work while also allowing traffic during peak hours.

The efforts to repair a deck end first start with an inspection to identify deterioration and determine limits. Access to these areas, especially for I-84 Eastbound, is a difficult task as the inspection must be completed from underside. Temporary working platforms have been hung throughout the interchange to allow tradesman safe access to the work day and night, while maintaining unrestricted vehicular movements.

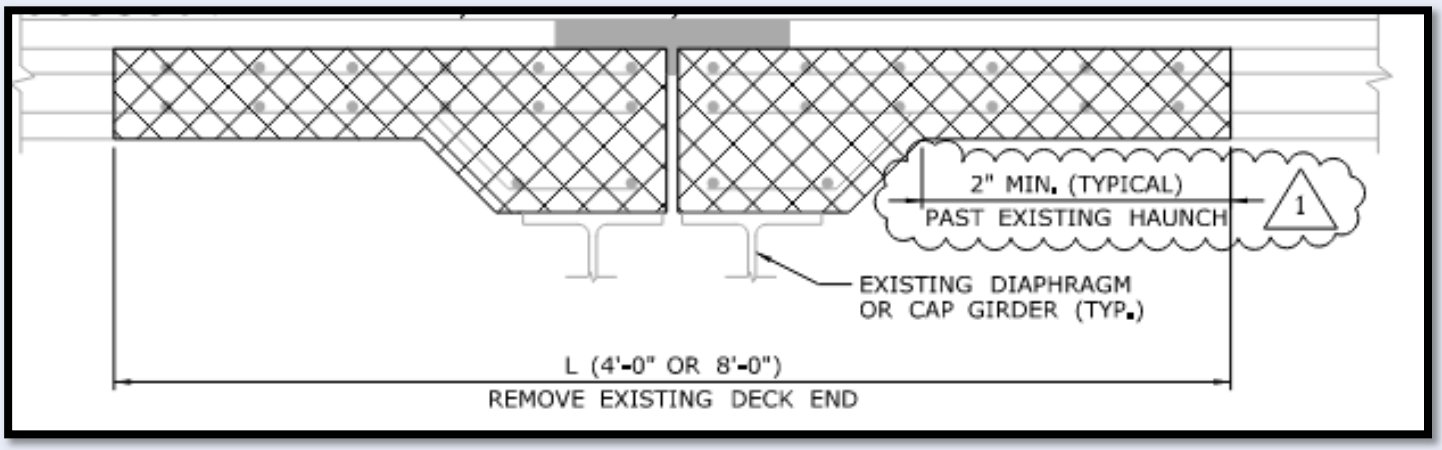
An initial inspection of the deck end determines the limits of repair. Deck ends have a thickened section, or haunch, reinforced to absorb and distribute traffic loads to the substructure below.

Once repairs are identified, plans are developed to perform the work with traffic impacts in mind. For I-84 Eastbound and I-84 Westbound, several deck ends are being completed simultaneously.

Demolition and reconstruction throughout the Interchange is scheduled so that staged work on the upper bridge decks is performed concurrently with work on the lower decks. More clearly, work on the left side of I-84 Westbound is performed at the same time as work performed along the right side of I-84 Eastbound. The same applies to Route 8 Northbound and Southbound. In doing so, the CTDOT can provide both motorist and worker safety.

The removal and reinstallation of a 12ft section of deck end takes between 4 to 7 work shifts to complete. In other words, 4 to 7 overnight lane closures are necessary to complete one 12ft section. In order to fully appreciate the magnitude of this repair effort, there are well over 200, 12ft deck sections that will be replaced on I-84.

First, the asphalt within the identified limits of rehabilitation is removed, exposing the top surface of the existing concrete bridge deck. The concrete deck is then saw-cut and removed using jack hammers and other excavation equipment. Since the existing structural steel of the bridge is to remain, care must be taken during the cutting and demolition process.



Concrete debris is shielded and contained from falling to areas below through the use of working platforms that also provide access to tradesman.

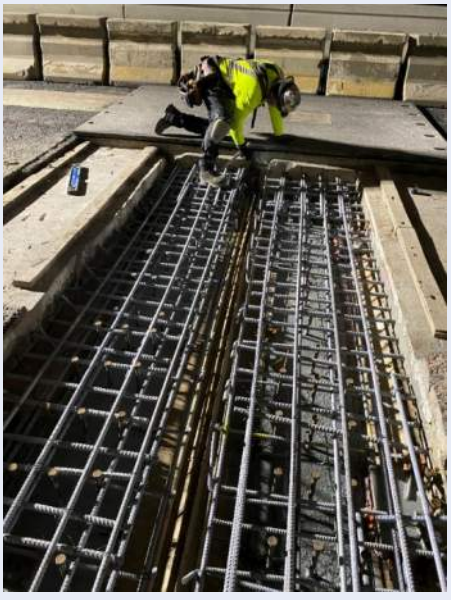
To ensure public safety, traffic is shifted to avoid active work areas.

Following the removal of deteriorated deck sections, connective reinforcing steel is drilled horizontally into the remaining deck as shown. This task is tedious and difficult given the amount of existing reinforcing that must be worked around to achieve proper embedment.

Once drilling and chemical anchoring of horizontal reinforcing is complete, formwork is installed, and the remaining reinforcing is placed.

Of critical importance is the gap that is established between deck ends. During this step, close attention is paid to the layout of the reinforcement and the formwork. The gap between deck sections is based on deck length and temperature at the time of reconstruction.

Following inspection of the completed work, high-early strength concrete is poured to complete the repair. High-early strength concrete will achieve the required compressive strength quicker than traditional concrete mixes allowing the roadway to be reopened to traffic in the allotted time.



As stated, deck end replacement efforts are completed over the course of 4 to 7 night-time shifts within lane closures. Great efforts are made to complete this work while also allowing unrestricted travel during peak travel hours. To accomplish the task, large steel plates are used to span gaps in the bridge surface and carry vehicular traffic. These plates are designed to carry the heavy traffic loading of tractor trailers, tankers and municipal vehicles that travel the interstate.

Steel Plates are installed concurrently with removal of the asphalt wearing surface and prior to removal of the deteriorated concrete below. Deck plates are either through bolted or chemically anchored so that they remain secure.

Deck end replacements will be a major project focus during the 2021 construction season, with work being performed along both I-84 Eastbound and Westbound. To expedite the effort so that work does not extend into the 2022 construction season and as mentioned earlier, CTDOT is considering lane shifts and ramp closures on I-84 Eastbound that would allow concurrent work and fewer construction joints.

As it is said, “time is money.” Every effort will be made to limit travel delays while building a quality, lasting product.

Thank you for your patience!