



Northeast Boundary Tunnel
Support of Excavation & Maintenance of Traffic Design

Submitted To:
DC Water Authority
Brierley Associates

Caleb Schmeltzer
Jordan Negro
Allie Zimmerman
Joe Hardin

April 21st, 2020

Michigan Technological University

Date:	April 21st, 2020	<p style="text-align: center;">HEAVY CIVIL & ENVIRONMENTAL</p> <p style="text-align: center;">MIDWEST</p> <p style="text-align: center;">CONSULTING</p> <p style="text-align: center;">1400 Townsend Drive Room 109 Houghton MI, 49931 (224) 656-3726</p>
Project:	Northeast Boundary Tunnel	
Submittal:	Final Design Submittal	
Re:	CEE4905 Senior Design Spring 2020	

Letter of Transmittal

To: Melanie Kueber Watkins, PhD, PE <mkueber@mtu.edu>

Copy To: Russ Lutch <rlutch@brierleyassociates.com>

Attn: We are sending you:

- Attached
- Under Separate Cover

Description: Final design of the SOE and MOT at the MOR shaft and diversion sites.

Disclaimer: This report, titled "Support of Excavation and Maintenance of Traffic Design", represents the efforts of undergraduate students in the Civil and Environmental Engineering Department of Michigan Technological University. While the students worked under the supervision and guidance of associated faculty members, the contents of this report should not be considered professional engineering. The designs outlined in the following documents should be reviewed by Professional Engineers prior to implementation. Michigan Technological University and the team members of Midwest Consulting are not liable for any incidents resulting from these designs.

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	<input type="checkbox"/> For Recording	

Remarks:

Approved By:



Allie Zimmerman
Midwest Consulting



Memorandum

To: Melanie Kueber Watkins, PhD, PE
From: Allie Zimmerman
Cc: Russ Lutch
Date: 04/21/2020
Re: Brierly NEBT SOE/MOT: Final Design Submittal

Washington DC's current sewer system is outdated and dumps untreated wastewater into waterways during overflow events, which is no longer allowed due to EPA regulations and the Clean Water Act. As owners, the DC Water Authority has hired Brierley Associates as the Engineer for the planning and construction of the Northeast Boundary Tunnel (NEBT). The NEBT is a tunnel with an inner diameter of 23', varying in depths of 60' and 180', and a total length over 5 miles, designed to remove the risk of waterway pollution when the system is overloaded. The project consists of a series of diversions sites and drop shafts that separate flow and account for changes in depths, respectively.

Midwest Consulting is responsible for the Support of Excavation (SOE) and Maintenance of Traffic (MOT) for the Mount Olivet Road (MOR) Shaft and Diversion Construction Sites. Midwest Consulting is continually coordinating with Frozen Construction who is responsible for the Temporary Site Civil, Maintenance of Flow for Stormwater, and Sanitary Sewer Design.

This submission includes the final design submittal for Midwest Consulting scope of work. All designs are preliminary and should be reviewed by a Professional Engineer prior to implementing designs. A presentation summarizing Midwest Consulting's design has also been submitted.



Allie Zimmerman
Midwest Consulting

1.0 Executive Summary

On behalf of Michigan Technological University, Midwest Consulting prepared the support of excavation and maintenance of traffic designs for the Northeast Boundary Tunnel located in Washington, DC. Existing conditions have been evaluated for the determination of the best support of excavation methods. Design groundwater levels are recommended to be adjusted to lower maximums and higher minimums. Dewatering is needed at the MOR drop shaft construction site with approximately 11 submersible wells with 10 hp operating at 10 gpm.

After determining the soil and water pressures, the most suitable method of support was chosen in accordance with the specifications. The near surface excavations will be supported with a soldier pile and lagging system, while the other structures will be supported by secant piles. The details can be found in the support of excavation section, as well as the attachments.

The project areas overlap the existing roadway. Because of this traffic must be redirected to maintain flow along the route. This is done by shifting traffic to the south side of Mount Olivet Rd and to keep traffic flowing in both directions with one lane going each way. Near the diversion chamber site the roadway needs to be widened to allow for this continued flow. Traffic will be directed with the existing signal at the intersection on Mount Olivet Rd and West Virginia Ave as well as signs and delineators as needed.

The estimated cost for Midwest Consulting's scope of work is \$12,495,028 with a total project duration of 98 days.