MOVING ROADS FORWARD

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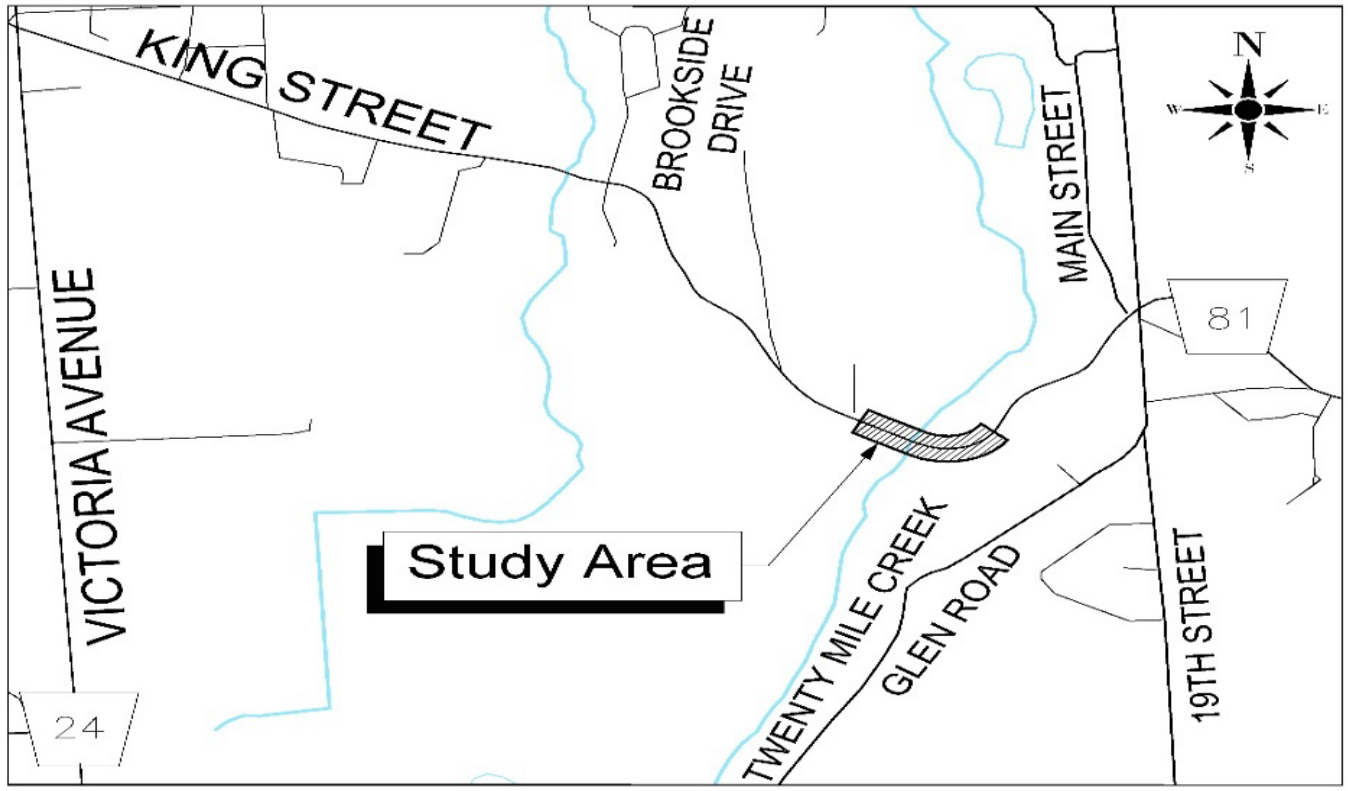
Replacement of the Twenty Mile Creek Bridge



Replacement of the Twenty Mile Creek Bridge

- Following the completion of the Municipal Class Environmental Assessment (June 2022), a detailed design was initiated.
- The detailed design was completed, followed by a formal tendering process.
- The contract was awarded to Urban Link in December 2024 by Regional Council.
- Construction to commence immediately, pending permitting from environmental regulatory agencies.
- A Public Information Centre will be scheduled in the near future to inform the public of the upcoming work.

Replacement of the Twenty Mile Creek Bridge

- The detailed design process involved many key partnerships and approval agencies.
  - Town of Lincoln
  - Niagara Escarpment Commission
  - Niagara Peninsula Conversation Authority
  - Municipal Operations Division (Regional and Town of Lincoln)
  - Department of Fisheries and Oceans
  - Ministry of the Environment, Conservation and Parks

Replacement of the Twenty Mile Creek Bridge

- The Town of Lincoln and the Niagara Region have been working through the Environmental Assessment and detailed design. This will continue as we progress through the construction.

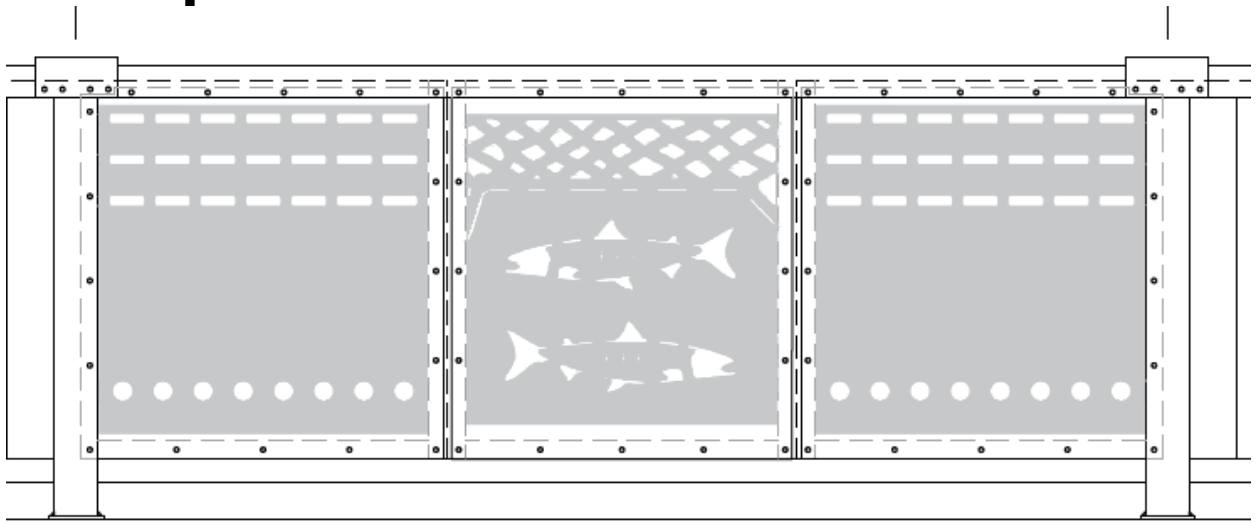
- We collaborated on design and construction timing with cost savings on the construction, administration and inspections.

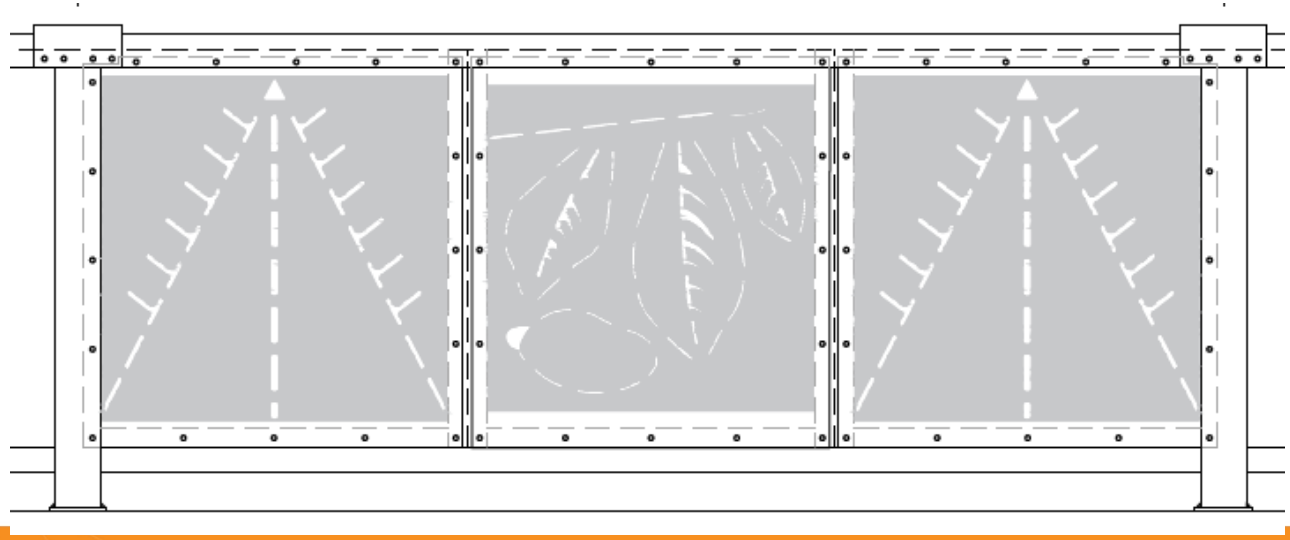
Replacement of the Twenty Mile Creek Bridge

- This particular project had a unique aspect where the Town of Lincoln and the Niagara Region collaborated on the Indigenous Park improvement.

- This included a unique design of the pedestrian railing on the north side of the bridge. These panels were designed through the Town and an Indigenous Artist.

Replacement of the Twenty Mile Creek Bridge

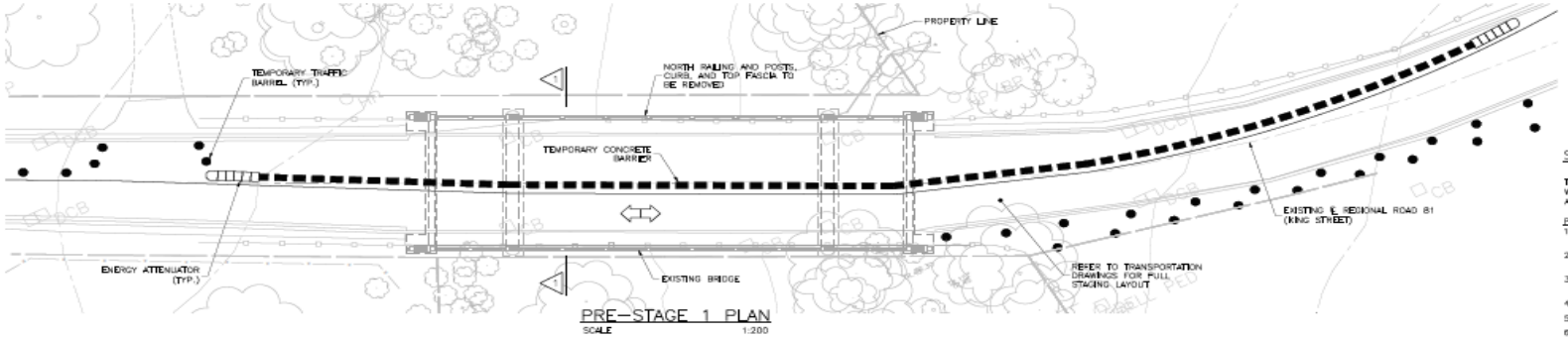




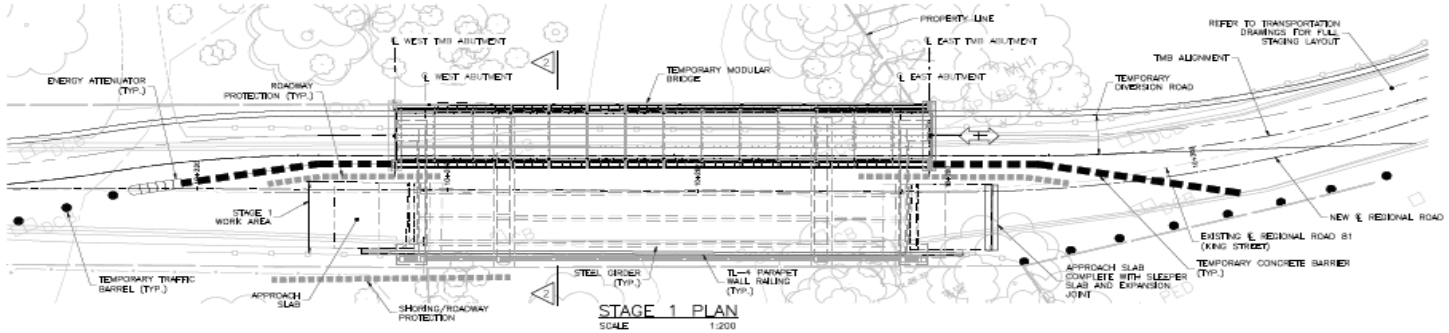
Replacement of the Twenty Mile Creek Bridge

- This project has a challenging aspect to address the Traffic Control to facilitate the construction.
- We were able to design the bridge replacement in a way that will allow a single lane of traffic to pass through the valley for the duration of the construction.
- The site will be controlled by temporary traffic signals on both sides of the bridge.
- There will be a few incidents where there will be a full closure. These will be limited to short durations and hopefully scheduled during off peak hours.

Replacement of the Twenty Mile Creek Bridge



PRE–STAGE 1 PLAN
SCALE 1:200



STAGE 1 PLAN
SCALE 1:200

STAGING WORKS:

THE FOLLOWING IS NOT AN EXHAUSTIVE SEQUENCE OF EVENTS OR SCOPE OF WORK BUT IS INTENDED TO GIVE A GENERAL OVERVIEW OF STAGING WORKS AND SEQUENCE.

PRE–STAGE 1:

1. INSTALL ENVIRONMENTAL PROTECTIONS, PROTECTION SYSTEMS, TEMPORARY CONSTRUCTION BARRIERS AND TRAFFIC CONTROL MEASURES.
2. DIVERT A SINGLE LANE OF TRAFFIC TO THE SOUTH HALF OF THE EXISTING STRUCTURE.
3. ALLOW ALTERNATING SINGLE LANE TRAFFIC DIRECTED BY PORTABLE TEMPORARY TRAFFIC SIGNALS.
4. REMOVE NORTH RAILING AND POSTS, CURB AND TOP OF ARCH FASCIA.
5. CONSTRUCT TEMPORARY MODULAR BRIDGE (TMB).
6. PREPARE DETOUR APPROACHES ONTO TEMPORARY MODULAR BRIDGE.

STAGE 1:

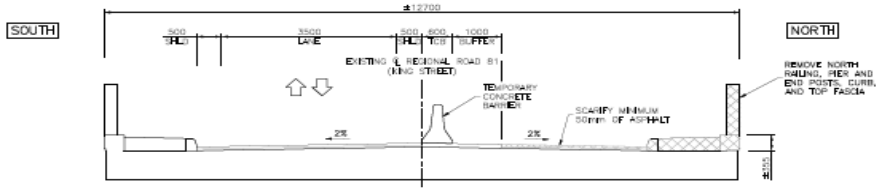
1. DIVERT TRAFFIC ONTO TEMPORARY MODULAR BRIDGE, ALLOWING AN ALTERNATING LANE OF TRAFFIC.
2. INSTALL ROADWAY PROTECTION SYSTEM BETWEEN STAGES AND ALONG SOUTH WEST CORNER.
3. REMOVE SOUTH PORTION OF EXISTING ARCH STRUCTURE.
4. CONSTRUCT SOUTH PORTION OF BRIDGE SUBSTRUCTURE.
5. CONSTRUCT SOUTH PORTION OF BRIDGE SUPERSTRUCTURE.

STAGE 2:

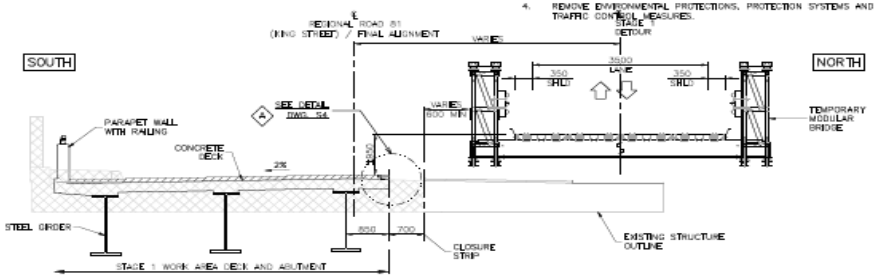
1. DIVERT TRAFFIC ONTO NEWLY CONSTRUCTED SOUTH PORTION OF NEW BRIDGE ALLOWING AN ALTERNATING LANE OF TRAFFIC.
2. REMOVE THE TEMPORARY MODULAR BRIDGE AND TEMPORARY ABUTMENT.
3. MODIFY ROADWAY PROTECTION TO ALLOW FOR STAGE 2 CONSTRUCTION.
4. REMOVE NORTH PORTION OF EXISTING ARCH STRUCTURE.
5. CONSTRUCT REMAINING NORTH PORTION OF BRIDGE SUBSTRUCTURE.
6. CONSTRUCT SOUTH PORTION OF BRIDGE SUPERSTRUCTURE, EXCEPT FOR CLOSURE STRIP.

FINAL WORKS:

1. CLOSE OFF BRIDGE TO TRAFFIC. REMOVE TEMPORARY CONSTRUCTION BARRIERS.
2. POUR CLOSURE STRIP FOR BRIDGE DECK.
3. COMPLETE PAVING AND WATERPROOFING.
4. REMOVE ENVIRONMENTAL PROTECTIONS, PROTECTION SYSTEMS AND TRAFFIC CONTROL MEASURES.



PRE–STAGE 1
SCALE 1:50



STAGE 1
SCALE 1:50

MOVING ROADS FORWARD

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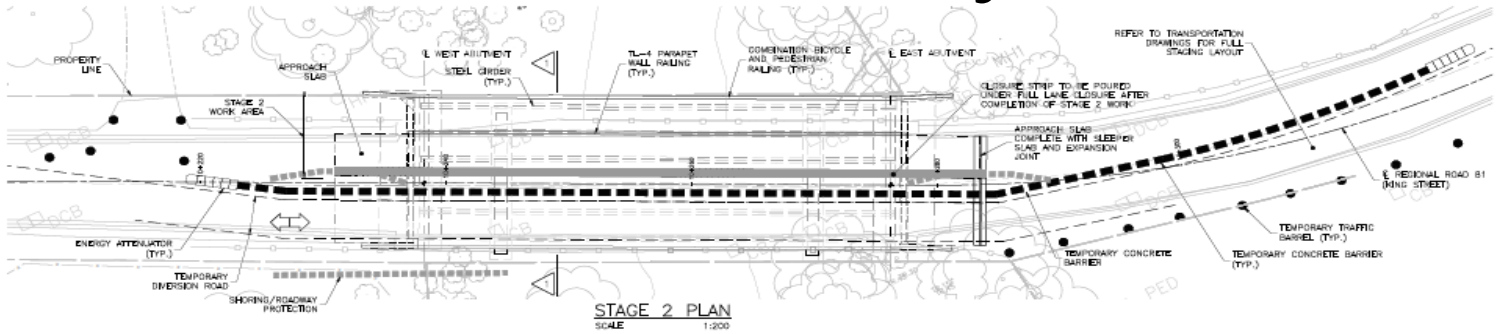
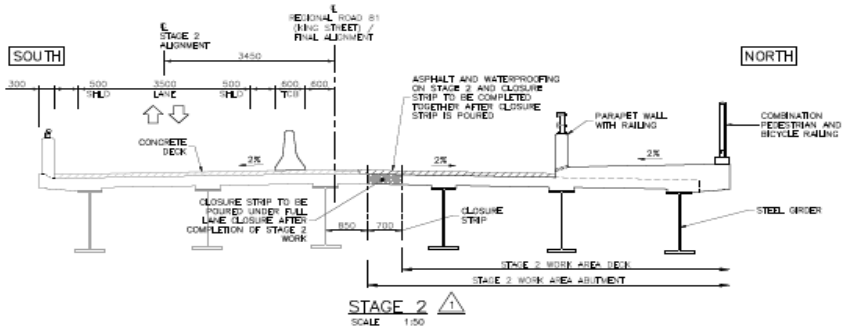
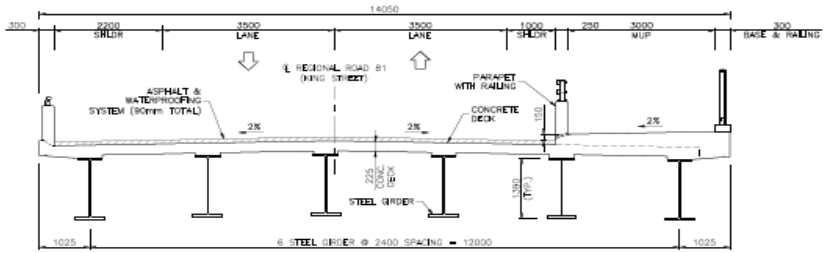
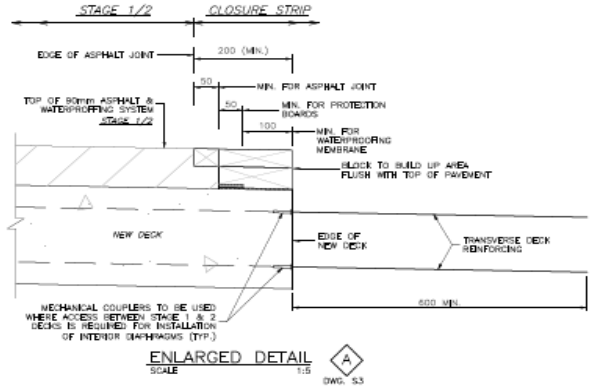
Niagara Region

Replacement of the Twenty Mile Creek Bridge









MOVING ROADS FORWARD

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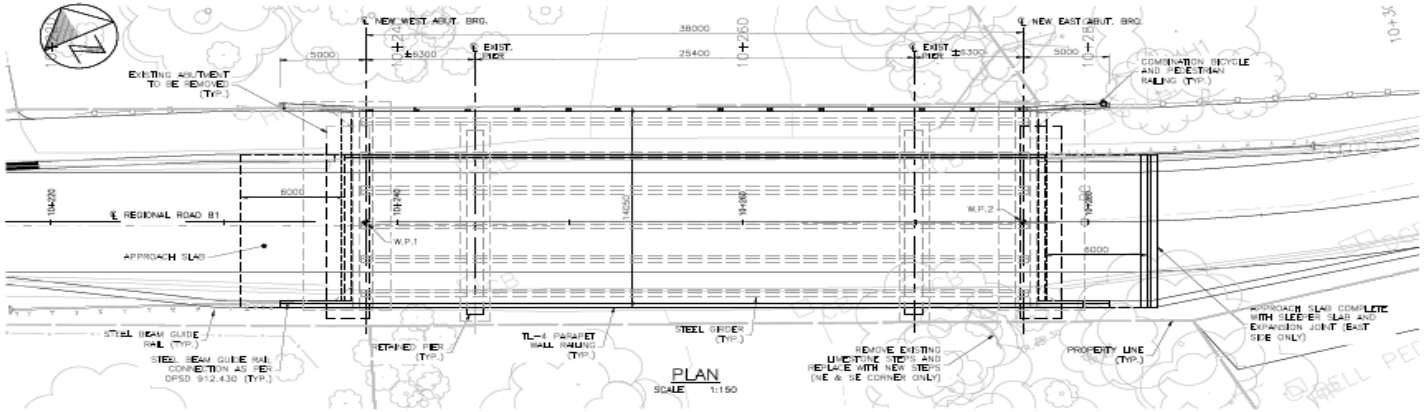
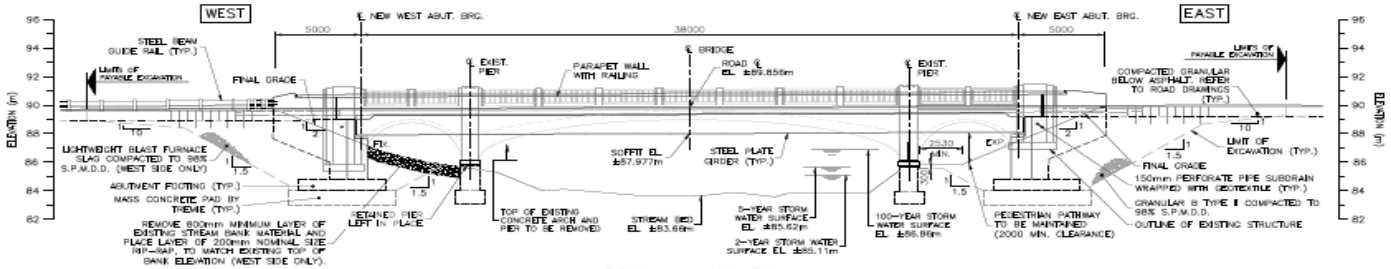
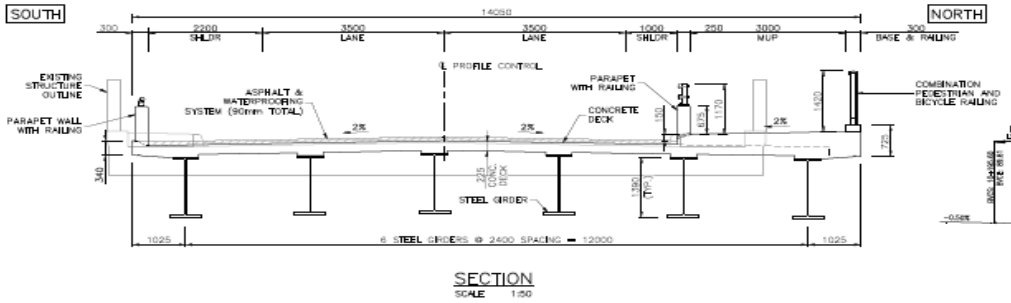
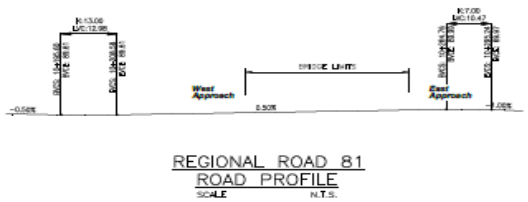
Niagara Region

Replacement of the Twenty Mile Creek Bridge









COORDINATE TABLE

CONTROL	NORTHING	EASTING	ELEVATION*	STATION
W.P. 1	4777885.925	632229.203	89.762	10+238.211
W.P. 2	4777868.440	632262.942	89.951	10+276.211

* ELEVATION IS MEASURED AT PROFILE CONTROL LINE.

GENERAL NOTES:

1. CLASS OF CONCRETE:
   - REINFORCED CONCRETE ..... 35 MPa, EXPOSURE CLASS–C1
   - MASS CONCRETE ..... 15 MPa.
2. CLEAR COVER TO REINFORCING STEEL:
   - DECK : TOP ..... 70±20
   - BOTTOM ..... 40±10
   - FOOTING : ..... 100±25
   - REMAINDER : ..... 70±20
   - GFRP : ..... 60±20

   UNLESS OTHERWISE SPECIFIED.
3. REINFORCING BARS:
   - REINFORCING STEEL SHALL BE GRADE 400W UNLESS OTHERWISE SPECIFIED.
   - STAINLESS REINFORCING STEEL SHALL BE TYPE 316LN, OR DUPLEX 2205 AND HAVE A MINIMUM YIELD STRENGTH OF 500 MPa. UNLESS OTHERWISE SPECIFIED. BAR MARKS WITH PREFIX 'S' DENOTE STAINLESS STEEL BARS.
   - TENSION LAP LENGTHS NOT INDICATED ON THE CONTRACT DRAWINGS SHALL BE CLASS B.
   - BAR HOOKS SHALL HAVE STANDARD HOOK DIMENSIONS —USING MINIMUM BEND DIAMETERS, WHILE STIRRUPS AND TIES SHALL HAVE MINIMUM HOOK DIMENSIONS. ALL HOOKS SHALL BE IN ACCORDANCE WITH THE STRUCTURAL STANDARD DRAWING SS12–1 UNLESS INDICATED OTHERWISE.
4. GLASS FIBRE REINFORCED POLYMER (GFRP) REINFORCING BARS SHALL BE GRADE II AS SPECIFIED IN THE CONTRACT DRAWINGS. BARS MARKED WITH PREFIX GII DENOTE GRADE II GFRP BARS. THE NOMINAL DIAMETER, TENSILE MODULUS OF ELASTICITY AND GUARANTEED MINIMUM TENSILE STRENGTH SHALL BE AS SPECIFIED IN THE CONTRACT DOCUMENTS.
5. ROADWAY PROTECTION SYSTEMS SHALL BE DESIGNED FOR PERFORMANCE LEVEL 2.

CONSTRUCTION NOTE:

1. THE CONTRACTOR SHALL ESTABLISH THE BEARING SEAT ELEVATIONS BY DEDUCTING THE ACTUAL BEARING THICKNESSES FROM THE TOP OF BEARING ELEVATIONS. IF THE ACTUAL BEARING THICKNESSES ARE DIFFERENT FROM THOSE GIVEN WITH THE BEARING DESIGN DATA, THE CONTRACTOR SHALL ADJUST THE REINFORCING TO SUIT.
2. CONSTRUCT ABUTMENTS AND WINGWALLS TO THE BEARING SEAT ELEVATIONS. THE CONTRACTOR SHALL SUPPLY TEMPORARY LATERAL BRACING FOR THE ABUTMENTS. FORMWORK AND LATERAL BRACING SHALL NOT BE REMOVED UNTIL CONCRETE HAS REACHED 75% OF ITS SPECIFIED 28–DAY STRENGTH.
3. BACKFILL SHALL NOT BE PLACED AGAINST END DIAPHRAGMS UNTIL THE DECK HAS REACH 75% OF ITS SPECIFIED CONCRETE COMPRESSIVE STRENGTH.
4. THE CONTRACTOR IS FULLY RESPONSIBLE FOR THE ADEQUATE PROTECTION OF ALL UTILITIES, SERVICES, STRUCTURES, ROADWAYS, WATERCOURSES, ETC. DURING CONSTRUCTION OPERATIONS.

APPLICABLE STANDARD DRAWINGS

OPSD – 3101.150 MINIMUM GRANULAR BACKFILL REQUIREMENT
OPSD – 3370.100 BRIDGE DECK WATERPROOFING
OPSD – 3370.101 BRIDGE DECK WATERPROOFING DETAILS
OPSD – 3419.100 GUIDE RAIL AND CHANNEL ANCHORAGE
DESIGN CODE & LOADING
CODE: CHBDC S6–19
LOADING: CL–625–ONT

LIST OF DRAWINGS:

S1.	GENERAL ARRANGEMENT
S2.	BOREHOLE LOCATIONS & SOIL STRATA
S3.	CONSTRUCTION STAGING I
S4.	CONSTRUCTION STAGING II
S5.	EXISTING STRUCTURE REMOVALS
S6.	FOUNDATION LAYOUT
S7.	ABUTMENTS LAYOUT
S8.	BEARINGS
S9.	SOUTH WINGWALLS
S10.	NORTH WINGWALLS
S11.	STRUCTURAL STEEL I
S12.	STRUCTURAL STEEL II
S13.	STRUCTURAL STEEL III
S14.	DECK LAYOUT
S15.	DECK REINFORCING
S16.	PARAPET WALLS I (SOUTH)
S17.	PARAPET WALLS II (NORTH)
S18.	SOUTH PARAPET RAILING
S19.	NORTH PARAPET RAILING
S20.	PEDESTRIAN/BICYCLE RAILING
S21.	PEDESTRIAN/BICYCLE RAILING PANEL LAYOUT
S22.	APPROACH SLAB
S23.	EXPANSION JOINTS TYPE C & SLEEPER SLAB
S24.	EXPANSION JOINTS TYPE A DETAILS
S25.	EXPANSION JOINT INSTALLATION SEQUENCE
S26.	PEDESTRIAN PATHWAY CONNECTION
S27.	PEDESTRIAN PATHWAY RAILING DETAILS

ABBREVIATIONS:

CONC.	CONCRETE
ABUT.	ABUTMENT
W/	WITH
EXIST.	EXISTING
TYP.	TYPICAL
APPROX.	APPROXIMATELY
INV.	INVERT
EL.	ELEVATION
C.J.	CONSTRUCTION JOINT
C/W	COMPLETE WITH
U/S	UNDER SIDE
T/	TOP
T/O	TOP OF
MIN.	MINIMUM
MAX.	MAXIMUM
℄	CENTRE LINE
C/C	CENTRE TO CENTRE
O/N	ON CENTRE
SBGR	STEEL BEAM GUIDE RAIL
W.P.	WORKING POINT
T/P	TOP OF PAVEMENT
T/F	TOP OF FOOTING
S.P.M.D.D	STANDARD PROCTOR MAXIMUM DRY DENSITY
S.W.	SIDEWALK
S.S.	STAINLESS STEEL
mm	MILLIMETERS
@	AT
⌀	DIAMETER

New Bridge Structure General Arrangement Drawing:

- 2- 3.5m travelled lanes
- 3.0m wide Multi use path
- Decorative pedestrian handrail

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Niagara Region

Replacement of the Twenty Mile Creek Bridge

- The construction timing is a major aspect of this project.
- There are environmental construction windows (times where work can proceed) that need to be met. There are timing restrictions in the spring and fall of each year.
- Given the staging (keeping 1 lane open) the construction will be a longer than ideal duration.
- The work on the temporary bridge and half of the new structure will be completed in 2025, with the 2nd half of the structure being completed in 2026. The entire project will be substantially complete by September of 2026.
- The work associated with the Town's park will be completed by September of this year, 2025.

Replacement of the Twenty Mile Creek Bridge

There will be updates on the progress of the construction and notifications to the public located on the Region's project page:

https://niagararegion.ca/projects/twenty-mile-creek-arch-bridge-replacement/default.aspx

We will be advising the public to visit this site for updates.

Replacement of the Twenty Mile Creek Bridge

Thank you for your time today

Questions?

My contact information is:

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Transportation Engineering
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michael.wilson@niagararegion.ca