

APPENDIX

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FISH AND FISH
HABITAT EXISTING
CONDITIONS AND
IMPACT ASSESSMENT
REPORT

MINISTRY OF TRANSPORTATION - EASTERN REGION

DRAFT FISH AND FISH HABITAT IMPACT ASSESSMENT REPORT

HIGHWAY 417 BRIDGE REHABILITATIONS
CONTRACT 2B (GWP 4074-11-00)





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MINISTRY OF TRANSPORTATION - EASTERN REGION

DRAFT

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1 INTRODUCTION

The Ontario Ministry of Transportation (MTO) has retained WSP Canada Inc. (WSP) to undertake the Environmental Assessment and Detail Design for the rehabilitation of three overpasses at the Highway 417 / Aviation Parkway interchange, and rehabilitation of the Walkley Road Underpass on Highway 417, in the City of Ottawa (GWP 4074-11-00).

The project includes the following works:

- Rehabilitation of the Highway 417 Aviation Parkway Off-Ramp (NBL) and Highway 417 Aviation Parkway On-Ramp (SBL) Overpass Bridges
- Rehabilitation of the Highway 417 Aviation Parkway Overpass “Y” Bridge
- Rehabilitation of the Highway 417 Walkley Road Underpass;
- Construction of a noise barrier in the vicinity of the Highway 417 westbound (WB) to Ottawa Road (OR) 174 eastbound (EB) ramp; and
- Related works, including pavement rehabilitation, drainage improvements, modifications to illumination / ATMS and landscaping

As part of the assignment, a Fish and Fish Habitat Existing Conditions Report was prepared by WSP in 2019 (GWP 4074-11-00 / GWP 4099-11-00 / GWP 4320-13-01). The Existing Conditions Report included field investigations conducted in July 2017, and addresses Cote Martin Drain, and the Tributary of Cote Martin Drain, as well as seven other watercourse crossings location on Highway 417 that are not included in the scope of work for this Impact Assessment.

This Fish and Fish Habitat Impact Assessment Report will refer to that report for existing conditions, but will include updates based on a site visit in October 2021. The Summary of Existing Conditions section will include the addition of Existing Fish Habitat Conditions Table (Template D2A), and the Existing Fish Community Summary Table (Template D2B) to update the Existing Conditions to conform to the Interim Environmental Guide for Fisheries (2020) which was released after submission of the Existing Conditions report. Three additional drainage culverts identified within the Aviation Parkway Interchange (as described below) were assessed and will be addressed in the Summary of Existing Conditions in Section 2 of this report.

The proposed works will be carried out within two distinct work zones, as shown in Figure 1-1 and described below.

Aviation Parkway Interchange

Rehabilitation of the interchange includes rehabilitation of the Northbound and Southbound overpass bridges and the “Y bridge” as well as construction of a noise barrier wall adjacent to the Highway 417 to OR 174 eastbound ramp. These works are within 30 m of the Cote Martin Drain which is east of the proposed noise barrier wall, a tributary to Cote Martin Drain which occurs adjacent to the Southbound overpass and “Y” Bridge, and 3 additional drainage culverts adjacent to the Northbound bridge draining to these watercourses.

Walkley Road Underpass

Rehabilitation of the Walkley Road Underpass will not impact any watercourses. Ramsay Creek occurs west of the interchange, and Borthwick Creek occurs north of the interchange, but both are greater than 200 m from the proposed work zone, therefore these works will not be addressed further in this report.

Table 1-1 and Figure 1-1 below indicates the details regarding the location of the assessed watercourse crossings, as well as the location of the proposed works within the study area. Constraint mapping has also been completed for the study area and has been included in Appendix A.

This Fish and Fish Habitat Impact Assessment Report will summarize the previously assessed Existing Conditions, and update conditions with the additional drainage culverts, describe the proposed works, provide design considerations and mitigation measures, assess potential impacts through the Pathways of Effects, and conclude the likelihood of death of fish or harmful alteration disruption or destruction (HADD) of fish habitat and recommendation for the project to proceed.

Table 1-1: Location of Work

GWP	Waterbody ID	Highway	Municipality	Latitude	Longitude
4074-11-00	Cote Martin Drain	Highway 417 / Ottawa Road 174	City of Ottawa	45.42509	-75.61595
4074-11-00	Tributary of Cote Martin Drain ("Y" Bridge)	Highway 417 / Ottawa Road 174	City of Ottawa	45.42337	-75.61866
4074-11-00	Tributary of Cote Martin Drain (Southbound Overpass)	Highway 417 / Aviation Parkway	City of Ottawa	45.42281	-75.62105
4074-11-00	Drainage Culvert #1 to Cote Martin Drain	Highway 417 / Aviation Parkway	City of Ottawa	45.42374	-75.62113
4074-11-00	Drainage Culvert #2 to Cote Martin Drain	Highway 417 / Aviation Parkway	City of Ottawa	45.42385	-75.62163
4074-11-00	Drainage Culvert #3 to Cote Martin Drain	Highway 417 / Aviation Parkway	City of Ottawa	45.42340	-75.62270

This assessment has been conducted in accordance with the requirements of the *MTO/DFO/OMNR Fisheries Protocol for Protecting Fish and Fish Habitat on Provincial Highway Undertakings – Version 4 (Pilot, 2020)* and the associated guidance provided in MTO's (2020) *Interim Environmental Guide for Fish and Fish Habitat (Fish Guide)*.

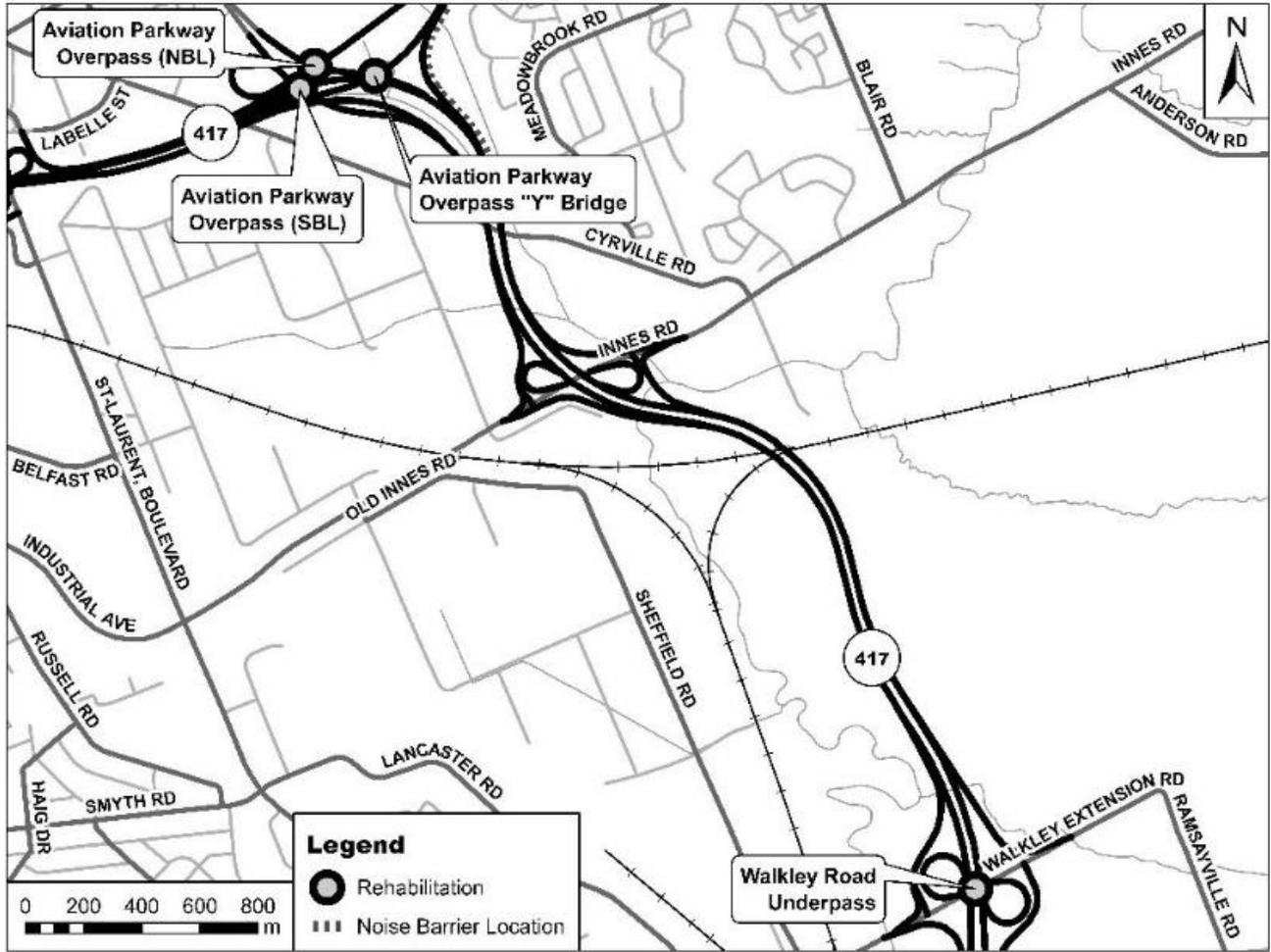


Figure 1-1: Key Site Plan for Highway 417 Bridges at Aviation Parkway and Walkley Road

2 SUMMARY OF FISH AND FISH HABITAT EXISTING CONDITIONS

This section of the report provides a summary of the existing fish and fish habitat conditions of the watercourses located within the study area as reported in the Existing Conditions Report (WSP 2019) and assessed through the 2021 site visit. A site visit was conducted on October 20th, 2021 to confirm and update fish habitat conditions in Cote Martin Drain and the Tributary to Cote Martin Drain which were described in the Existing Conditions Report, and to characterize the three drainage culverts identified within the study area which were not included in the previous report.

This section includes a brief description of each watercourse, with reference to the Existing Conditions report for detailed information. The new drainage culverts that were not included in the Existing Conditions Report are described here in detail, with representative photographs included in Appendix B and field sheets included in Appendix C.

The Existing Fish Habitat Summary Table (Table 2-1), and Existing Fish Community Summary Table (Table 2-2) have been included here for all watercourses in the study area to update the report in accordance with the Interim Fish Guide (2020).

2.1 FISH AND FISH HABITAT

2.1.1 COTE MARTIN DRAIN

Cote Martin Drain is a municipal drain which appears to originate approximately 1 km west of the most upstream culvert west of Highway 417 as surface run-off and drainage outflow from adjacent wetlands. The drain flows east under Highway 417, then south under OR 174, then meanders south out of the ROW, converging with flows from the Tributary to Cote Martin Drain, and South Cyrville Drain, eventually draining into Green's Creek. The three culvert locations under OR 174 and the reach downstream (adjacent to the Highway 417 / OR 174 ramp) were assessed for fish and fish habitat existing conditions as part of the 2019 Existing Conditions Report (WSP 2019). Refer to Existing Conditions Report (WSP 2019) and Templates D2A (Table 2-1) and D2B (Table 2-2) for details. The reach downstream of OR 174 was re-assessed during the 2021 field investigation and is described greater detail below.

Downstream of the culvert under OR 174 eastbound lanes, the Cote Martin Drain flows out of the ROW as riffle habitat within a distinct channel and defined banks for approximately 25 m before becoming flat habitat for the remainder of the reach (75 m). Both banks were stabilized by dense vegetation such as forbs and grasses including Goldenrod (*Solidago sp.*) and Reed Canary Grass (*Phalaris arundinacea*). The mean wetted width within the riffle habitat was approximately 3.9 m, with a mean wetted depth of approximately 0.10 m. The mean bankfull width of the riffle habitat was approximately 5 m, with a mean bankfull depth of approximately 1 m. The mean wetted width within the flat habitat was approximately 2.8 m, with a mean wetted depth of approximately 0.35 m. The mean bankfull width of the flat habitat was approximately 5 m, with a mean bankfull depth of approximately 1 m. The substrates within the riffle reach were comprised of cobbles (70%), gravel (20%) and sand (10%). The substrates within the flat reach were comprised of silt (50%), sand (30%), cobbles (10%) and detritus (10%). There was minimal instream and overhanging cover (e.g., grasses, cattails, and downed branches) present within the downstream reach. Riparian trees and shrubs including Common Buckthorn (*Rhamnus cathartica*), Manitoba Maple (*Acer negundo*), and American Elm (*Ulmus americana*) shaded some portions of the watercourse (35%). In-stream vegetation was present in scattered clumps within this reach and composed of only Curly-leaf Pondweed (*Potamogeton crispus*), while overhanging vegetation such as Reed Canary Grass and Goldenrod were present and shaded approximately 35% of the watercourse. Bank erosion was observed throughout the reach at the time of assessment and was measured to be approximately 0.2 m undercut in most places. There was no evidence of groundwater inputs at the time of assessment.

Fish sampling conducted in 2017 resulted in the capture of warmwater tolerant baitfish and forage fish species. Fish were not observed during the 2021 site investigation; however, a minnow trap was observed on the shoreline, suggesting the continued presence of small-bodied fishes. As such, this watercourse is considered direct warmwater fish habitat.

2.1.2 TRIBUTARY TO COTE MARTIN DRAIN

AQUATIC HABITAT

The median drainage ditch of Highway 417 south of Aviation Parkway / OR 174 interchange is a tributary to Cote Martin Drain. The tributary appears to originate as two branches within the Highway 417 and OR 174 median as surficial and highway drainage. The two branches flow through a culvert under the Aviation Parkway Southbound bridge, and under the Aviation Parkway “Y Bridge”, then converge and flow approximately 850 m southeast through the median to a culvert under Highway 417 westbound lanes. The tributary flows under the westbound lanes of Highway 417 through an approximately 4 m wide by 1.5 m high open foot concrete culvert and drain to Cote Martin Drain approximately 40 m downstream of the culvert outlet. Cote Martin Drain then flows southeast for approximately 550 m before converging with the South Cyrville Drain and continuing to flow south into Green’s Creek.

In the 2019 Existing Conditions report, the reach of the tributary flowing in the median between the Aviation Parkway bridges and the culvert under the Highway 417 westbound lanes was described as a distinct channel with stable undefined banks through the median ditch densely vegetated with cattails and herbaceous forbs. The tributary was composed entirely of flat habitat with a mean bankfull width of approximately 7 m and mean bankfull depth of approximately 1.6 m.

Fish community sampling during the 2017 field assessment resulted in warmwater baitfish and forage fish including Young-of-the-Year. This watercourse is therefore considered direct warmwater fish habitat.

Refer to Existing Conditions Report (WSP 2019) and Templates D2A (Table 2-1) and D2B (Table 2-2) for details.

2.1.3 DRAINAGE CULVERTS 1, 2 & 3

AQUATIC HABITAT

DRAINAGE CULVERT #1 TO TRIBUTARY OF COTE MARTIN DRAIN (S CULVERT UNDER AVIATION NB BRIDGE)

This drainage culvert, a 750 mm corrugated steel pipe (CSP), runs parallel to the OR 174 EB lanes and conveys roadside drainage from west to east, towards the Tributary to Cote Martin Drain. At the time of the field investigation in October 2021, this drainage ditch was completely dry. The mean bankfull width was estimated to be 2 m with a bankfull depth of 0.3 m. To the west, the drainage ditch was dominated by mowed grass, with abundant Riverbank Grape (*Vitis riparia*) at the inlet. To the east, the drainage ditch was dominated by grasses, goldenrods, and Glossy and Common Buckthorn. The drainage ditch was dry for approximately 150 m to the east of the culvert, where it meets the Tributary to Cote Martin Drain on the south side of the OR 174 EB lanes. This drainage ditch is considered intermittent, indirect fish habitat. Refer to Templates D2A (Table 2-1) and D2B (Table 2-2) for details.

DRAINAGE CULVERT#2 TO TRIBUTARY COTE MARTIN DRAIN (N CULVERT UNDER AVIATION NB BRIDGE)

This drainage culvert, a 750 mm CSP, runs parallel to the OR 174 WB lanes and conveys roadside drainage from west to east. At the time of the field investigation in October 2021, this drainage ditch was completely dry. The mean bankfull width was estimated to be 2 m with a bankfull depth of 0.3 m. To the west, the drainage ditch was dominated by mowed grass. To the east, the drainage ditch was dominated by grasses, cattails, and Glossy Buckthorn (*Rhamnus frangula*) and Common Buckthorn. Approximately 200 m east of this culvert, the drainage ditch reaches a small cattail marsh area with a 750 mm CSP culvert that runs north to south, under OR 174, where it continues as the Tributary to Cote Martin Drain. This drainage ditch is considered intermittent, indirect fish habitat. Refer to Templates D2A (Table 2-1) and D2B (Table 2-2) for details.

DRAINAGE CULVERT #3 TO TRIBUTARY COTE MARTIN DRAIN (N CULVERT UNDER AVIATION SB BRIDGE)

This drainage culvert, a 750 mm CSP, runs parallel to the OR 174 WB lanes and conveys roadside drainage from west to east, towards Culvert #2. At the time of the field investigation in October 2021, this drainage ditch was completely dry. The

mean bankfull width was estimated to be 2 m with a bankfull depth of 0.3 m. To the west, the drainage ditch consisted of a mix of mowed grass, cattails, and a buckthorn thicket. To the east, the drainage ditch was dominated by mowed grass. This drainage ditch is considered intermittent, indirect fish habitat. Refer to Templates D2A (Table 2-1) and D2B (Table 2-2) for details.

2.2 SPECIES AT RISK

The term SAR is used to encompass species that are listed as Extirpated, Endangered, Threatened, or Special Concern under Ontario's *Endangered Species Act* (ESA) (2007) or the federal *Species at Risk Act* (SARA) (2002). According to the background information provided by the MNRF, and reported in the Existing Conditions Report (WSP 2019), there are no fish SAR records present within the study area. This was updated and confirmed through available background data queried in 2021. As such, no ESA (2007) or SARA (2002) approval related to fish species are required for the proposed works.

Table 2-1: Existing Fish Habitat Summary

Waterbody ID	Date	Flow	Thermal Regime	Fish Habitat*	Substrate Type	Channel Morphology	Vegetation	Constraints & Opportunities	Significant Fish Habitat
Cote Martin Drain	July 30, 2017 & October 20, 2021	Permanent	Warm	Direct	Riffle: Cobble (70%), Gravel (20%), Sand (10%) Flat: Silt (50%), Sand (30%), Cobble (10%), Detritus (10%)	Flat, Riffle	<u>Riparian:</u> Cattails, Grasses, Forbs <u>In-water:</u> Cattails, Pondweed	Minor erosion of banks	None
Tributary to Cote Martin Drain	July 30, 2017	Intermittent	Warm	Direct	Sand (50%), Silt (20%), Cobble (20%), Muck (10%)	Flat, Run, Riffle	<u>Riparian:</u> Cattails, Grasses, Forbs <u>In-water:</u> Cattails, Watercress	Minor erosion of banks	None
Drainage Culvert 1	October 20, 2021	Ephemeral	Warm	Indirect	Vegetated soil (100%)	Flat	<u>Riparian:</u> Grasses, Buckthorn, Riverbank Grape <u>In-water:</u> Grasses	None	None
Drainage Culvert 2	October 20, 2021	Ephemeral	Warm	Indirect	Vegetated soil (100%)	Flat	<u>Riparian:</u> Grasses, Cattails, Buckthorn <u>In-water:</u> Grasses, Cattails	None	None
Drainage Culvert 3	October 20, 2021	Ephemeral	Warm	Indirect	Vegetated soil (100%)	Flat	<u>Riparian:</u> Grasses, Cattails, Buckthorn <u>In-water:</u> Grasses, Cattails	None	None

Table 2-2: Existing Fish Community Summary

Waterbody ID	Date	Fish Species Present	Year Class(es)	Species at Risk Present	In-water Works Timing Window
Cote Martin Drain	July 30, 2017 & October 20, 2021	Direct Fish Habitat (NDMNR + 2017 Field Investigations). Fish Community consisting of Banded Killifish, Brassy Minnow, Blacknose Dace, Brook Stickleback, Central Mudminnow, Common Shiner, Creek Chub, Fathead Minnow, Johnny Darter, and White Sucker.	Adult and YOY	None	Work Permitted July 1 to March 15
Tributary to Cote Martin Drain	July 30, 2017	Direct Fish Habitat (NDMNR + 2017 Field Investigations). Fish Community consisting of Blacknose Dace, Brook Stickleback, Central Mudminnow, Common Shiner, Creek Chub, Johnny Darter, and White Sucker.	Adult and YOY	None	Works Permitted July 1 to March 15
Drainage Culvert 1	October 20, 2021	None – Indirect Fish Habitat	N/A	N/A	Works Permitted July 1 to March 15
Drainage Culvert 2	October 20, 2021	None – Indirect Fish Habitat	N/A	N/A	Works Permitted July 1 to March 15
Drainage Culvert 3	October 20, 2021	None – Indirect Fish Habitat	N/A	N/A	Works Permitted July 1 to March 15

3 PROPOSED WORKS AND POTENTIAL IMPACTS

The proposed work and potential impacts for each watercourse are discussed below. Design drawings for the specified locations are included in Appendix D.

3.1 COTE MARTIN DRAIN – NOISE BARRIER WALL

3.1.1 PROPOSED WORKS

The noise barrier wall construction will involve the following components:

- A new noise barrier will be installed from Cyrville Road at the south end, adjacent to the OR 174 EB ramp north to approximately 11 m from Cote Martin Drain. Noise barrier will generally be installed between 30 m and 120 m from the bank of Cote Martin Drain with the exception of the north end.
 - 2.0 x 9.2 m rip rap drainage over geotextile will be installed at north end of noise barrier, with the nearest edge approximately 4 m from the bank of Cote Martin Drain.
 - The noise barrier will be installed over the existing concrete culvert conveying the Tributary to Cote Martin Drain, with posts installed on either side of the culvert, with noise barrier panels spanning the culvert. Therefore no in-water works or alteration to the existing culvert are required.
-

3.1.2 POTENTIAL IMPACTS

No direct impacts are anticipated, as no in-water works are proposed at Cote Martin Drain.

Potential indirect impacts of the proposed works include:

- increased erosion and sedimentation to the watercourse,
- minor loss of riparian vegetation, and
- spills of materials and oils from machinery.

These indirect impacts are assessed through the Pathways of Effects (POEs) in Table 3-1 to identify required mitigation measures and determine any residual negative effects. The POE assessment shows that these potential impacts can be managed by implementation of the mitigation measures described in Table 3-1 and will not result in any residual negative effects.

3.2 TRIBUTARY TO COTE MARTIN DRAIN – AVIATION PARKWAY BRIDGES

3.2.1 PROPOSED WORKS

The Aviation Parkway Northbound (NB), Southbound (SB), and “Y” Bridge will be rehabilitated. The NB bridge is more than 30 m from the Tributary to Cote Martin Drain. The structural rehabilitation of the SB Bridge and Overpass “Y” Bridge will involve the following components:

- barrier wall and expansion joint replacement,

- deck repairs,
- slope paving replacement,
- repaving and
- installation of “snow fence”

No works to the culverts conveying the Tributary to Cote Martin Drain, or any in-water works are required for the bridge rehabilitations.

3.2.2 POTENTIAL IMPACTS

No direct impacts are anticipated, as no in-water works are proposed at either crossing of the Tributary to Cote Martin Drain.

Potential indirect impacts of the proposed works include:

- increased erosion and sedimentation to the watercourse,
- minor loss of riparian vegetation, and
- spills of materials and oils from machinery.

The rehabilitation of the Highway 417 Aviation Parkway NB and SB Bridges, and Overpass “Y” Bridge fall under the Bridge Maintenance BMP. Potential impacts from these works can be avoided or minimized by following the conditions and mitigation measures detailed in the BMP, which has been included in Appendix E.

Since these works can be assessed at Step 3 of the Protocol, and the MTO BMPs can be applied, these works / watercourses are not included in Table 3-1 Aquatic Effects Summary Table, or Appendix F - Fish and Fish Habitat Impact Documentation.

3.3 DRAINAGE CULVERTS – AVIATION PARKWAY BRIDGES

3.3.1 PROPOSED WORKS

The rehabilitation of the Highway 417 Aviation Parkway NB Bridge will involve the replacement of three drainage culverts in the ditch adjacent to OR 174. The culvert replacements will involve the following components:

- Like-for-Like Culvert Replacement of existing drainage culverts (762 mm diameter) with 900 mm culverts of equal length, and
 - Ditch maintenance between culverts including rock erosion protection at inlets and outlets.
-

3.3.2 POTENTIAL IMPACTS

Permanent direct impacts to the watercourse include:

- Increased diameter of culverts ensuring no narrowing of existing channel or flow constriction.

Potential indirect impacts of the proposed works include:

- increased erosion and sedimentation to the watercourse,
- minor loss of riparian vegetation, and
- spills of materials and oils from machinery.

The drainage culverts are considered intermittent, indirect fish habitat, and the works can be completed under MTO BMPs for Like-For-Like Culvert Replacement and Ditch Maintenance Within 30 Meters of a Waterbody. No impacts to fish habitat downstream are anticipated if the conditions and mitigation in the BMPs are adhered to. The applicable BMPs have been included in Appendix E.

Since these works can be assessed at Step 3 of the Protocol, and the MTO BMPs can be applied, these works / watercourses are not included in Table 3-1 Aquatic Effects Summary Table, or Appendix F - Fish and Fish Habitat Impact Documentation.

4 DESIGN CONSIDERATIONS AND MITIGATION MEASURES

Sensitivities in the fish and fish habitat present in the watercourses were considered in light of the proposed works to identify design considerations. Potential impacts to the watercourses are limited to indirect or temporary impacts from construction activities and grading. The table below describes measures in the design that have been considered and applied to minimize the risk of impacts to fish and fish habitat in the watercourses and downstream. Specific mitigation measures to be implemented during construction and included in the contract documents are addressed in Section 4.2 following the design considerations table. The BMPs for Like-for Like Culvert Replacement, Ditch Maintenance with 30 m of a Waterbody, and Bridge Maintenance apply to portions of the proposed works.

4.1 DESIGN CONSIDERATIONS

Table 4-1: Design Considerations

Factors to Consider	Design Considerations Provided by the Fisheries Assessment Specialist	Describe How Each Factor Was Addressed Through Design
In-water Works Timing Window	In-water works permitted between July 1 and March 15 as per Ministry of Northern Development, Mines, Natural Resources and Forestry (NDMNRF) Kemptonville District Timing Windows.	The timing window applies to all works in or near the watercourse and their banks.
Significant Fish Habitat	<p>No aquatic Species at Risk identified.</p> <p>Cote Martin Drain: Direct fish habitat should be maintained and protected. Young-of-the-Year indicate spawning of baitfish in the study area.</p> <p>Tributary to Cote Martin Drain: Direct fish habitat should be maintained and protected. Young-of-the-Year indicate spawning of baitfish in the study area.</p> <p>Drainage Culverts to Tributary to Cote Martin Drain: Indirect fish habitat, however, works in/near the drainage ditches may impact downstream direct fish habitat.</p>	<p>Work will be isolated from the wetted channel and no works or alteration will occur within the existing channel.</p> <p>Appropriate environmental protection and erosion and sediment control (ESC) measures will be implemented for adjacent grading works, and culvert replacement works, according to the Contract Documents including:</p> <ul style="list-style-type: none"> - Siltation fencing to be installed at the top of bank of the watercourse prior to the start of works and be maintained until bank is stabilized following grading works according to OPSS.PROV 182 and

Factors to Consider	Design Considerations Provided by the Fisheries Assessment Specialist	Describe How Each Factor Was Addressed Through Design
		OPSS.PROV 805 - Removal of riparian vegetation on the highway embankment shall limited to the grading area and restored immediately following completion of works according to OPSS.PROV 182 and OPSS.PROV 804
Fish Passage	<p>Cote Martin Drain and the Tributary to Cote Martin Drain: Watercourses support direct fish use, and fish passage should be maintained through proposed work areas and existing culverts.</p> <p>Drainage Culverts to Tributary to Cote Martin Drain: Indirect fish habitat only. Fish passage is not a consideration for culvert replacements.</p>	No in-water works or alterations to existing culverts on Cote Martin Drain or Tributary to Cote Martin Drain, therefore fish passage will be maintained in current condition.

4.2 STANDARD CONSTRUCTION-RELATED MITIGATION MEASURES

The proposed works may have potential indirect impacts on fish and fish habitat in the watercourses present in the study area. All of the potential impacts can be avoided or minimized following the recommended standard and site-specific mitigation measures outlined in this section.

Specific mitigation to be followed in MTO BMPs (Like-for Like Culvert Replacement, Ditch Maintenance with 30 m of a Waterbody, and Bridge Maintenance) can be found in the attached BMPs in Appendix E. Mitigation measures in OPSS 182, General Specification for Environmental Protection for Construction in and Around Waterbodies and on Waterbody Banks also applies to works in or adjacent to all watercourses. Mitigation specific to the assessment of the noise barrier wall at Cote Martin Drain is listed in Table 3-1, but all measures specified are standard practices detailed in the OPSS noted above and the following section.

The following mitigation measures are recommended for implementation to avoid or minimize temporary or indirect impacts to fish habitat resulting from construction activities.

CONSTRUCTION DESIGN

- A permissible in-water timing window of **July 1 to March 15** will be implemented to for all works in or adjacent to watercourses including drainage culvert replacements as outlined in the Ontario Provincial Standard Specification (OPSS) 182 and 185. As such, no in-water works will be permitted between March 16 and June 30 of any given year.
- Any temporarily stockpiled soil, debris or other excess materials, and any construction-related materials, will be properly contained (e.g., within silt fencing) in areas at least 30 m from all watercourses in accordance with OPSS 180. All construction materials, excess materials and debris should be removed and appropriately disposed of following construction.

- The Contract Administrator’s team will include an Environmental Inspector experienced in working around watercourses, who will be responsible for ensuring the erosion and sediment control measures are functioning effectively, being maintained, and that all of the other general mitigation measures are being implemented as intended. The Environmental Inspector will also ensure all environmental mitigation and design measures are properly installed / constructed and maintained. Appropriate contingency and response plans will be in place and implemented if required.
- If the Contractor wishes to alter any of the mitigation plans as outlined in the Contract Document, then the associated approval agency will need to be made aware of and approve the changes prior to construction.

SEDIMENT AND EROSION CONTROL MEASURES

- The Contractor will follow the erosion and sediment control measures identified in the contract (OPSS 805) and prevent / control potential for erosion and sediment caused by their construction methods and operations so as to meet all legislative requirements, to prevent entry of sediments into watercourses, and to prevent damage to features and property inside or outside of the ROW.
- If dewatering within the construction zone is required, the contractor will ensure that water will be managed and released so as to prevent erosion and that only clean flow is released to the watercourse.

OPERATION AND MACHINERY

- All construction-related activities should be controlled so as to prevent entry of any petroleum products, debris or other potential contaminants / deleterious substances, in addition to sediment as outlined above, to the watercourses.
- No equipment should be allowed to ford or otherwise enter any watercourse except as specified in the contract or unless authorized by the appropriate environmental agencies and permits.
- Any temporarily stockpiled material, construction or related materials will be properly sited and contained in accordance with OPSS 180 in the contract documents.

FISH PROTECTION

- No in-water work is anticipated to be required on fish-bearing watercourses. However, in the case of any in-water works, before in-water work begins, a fish rescue will occur within isolated work areas in accordance with OPSS 182. If work is conducted in dry conditions at the drainage culvert replacements, no fish rescue is required.

5 LIKLIHOOD OF DEATH OF FISH OR HADD OF FISH HABITAT

The assessment of risk of causing the death of fish or HADD of fish habitat as a result of the proposed works was carried out in accordance with MTO's 2020 Pilot Protocol. This step-wise assessment process involves comparing the proposed works against a series of criteria to determine whether or not the works are anticipated to cause the death of fish or HADD of fish habitat. If the proposed works cannot meet the criteria in one assessment step, then the assessment progresses to the next step until it can be determined whether the proposed works can be mitigated such that the death of fish or HADD of fish habitat will be avoided. If the proposed works cannot be sufficiently mitigated then Fisheries and Oceans Canada's (DFO's) review of the project will be required to determine the potential that death of fish or HADD of fish habitat will result from the proposed works.

Identification of applicable BMPs was undertaken at Step 3 of the protocol, and if no BMPs apply, a description of the likelihood of death of fish or HADD of fish habitat based on the assessment of Pathways of Effects (POEs) at Step 4 of the protocol is completed below.

5.1 COTE MARTIN DRAIN

Proposed construction of a noise barrier along the Highway 417 WB to OR 174 EB ramp, in the vicinity of Cote Martin Drain has the potential to cause indirect impacts to direct fish habitat. No BMPs apply to construction of the noise wall within 30 m of the drain and the existing culvert conveying the Tributary to Cote Martin Drain, therefore the proposed works were assessed at Step 4 of The Protocol through the POEs.

All potential impacts are indirect in nature (no in-water works), and following implementation of mitigation measures identified through the POEs, no residual effects are anticipated. For the proposed works, death of fish and HADD to fish habitat are unlikely. The POE assessment is detailed in Table 3-1, and an Aquatic Effects Assessment Summary Table (Template D4) has been included for Cote Martin Drain in Appendix F.

5.2 TRIBUTARY TO COTE MARTIN DRAIN

Proposed rehabilitation of the Highway 417 Aviation Parkway NB and SB Bridges, Overpass "Y" Bridge can be addressed at Step 3 of The Protocol. There are no in-water works or alterations to the existing watercourses or culverts proposed, therefore the proposed structural rehabilitations of the overpass bridges can be addressed through the MTO BMP for Bridge Maintenance. This watercourse and proposed works are therefore not included in the Aquatic Effects Summary Table (Table 3-1), or the Aquatic Effects Assessment Summary Table (Appendix F). The BMP for Bridge Maintenance is included in Appendix E.

5.3 DRAINAGE CULVERTS

Proposed replacement of three drainage culverts and ditch maintenance under the Highway 417 Aviation Parkway NB Bridge can be addressed at Step 3 of The Protocol. The culverts will be replaced with culverts of equal length and slightly larger diameter (from approx. 750 mm to 900 mm), therefore the MTO BMP for Like-for-Like Culvert Replacement applies to the culvert replacements. The ditch between the culverts is an existing drainage ditch requiring clean out and regrading, which can be addressed through the MTO BMP for Ditch Maintenance within 30 m of a Waterbody. These drainage culverts and proposed works are therefore not included in the Aquatic Effects Summary Table (Table 3-1), or the Aquatic Effects Assessment Summary Table (Appendix F). The Like-for-Like Culvert Replacement and Ditch Maintenance BMPs are included in Appendix E.

6 CONCLUSIONS

This report summarizes the existing fish and fish habitat conditions and impact assessment of the proposed works on Highway 417 at the Aviation Parkway Bridges for the two watercourses and three drainage culverts present within the study area. The aquatic habitat and fisheries documentation within this report was based on background information (including the Fish and Fish Habitat Existing Conditions Report [WSP 2019]), consultation with relevant agencies, and completion of field investigations conducted in 2021 by WSP Ecology staff.

No in-water works are proposed within direct fish habitat (Cote Martin Drain and Tributary to Cote Martin Drain). In-water works are proposed in the intermittent, indirect fish habitat of the drainage culverts to Tributary to Cote Martin Drain.

The assessment of impacts on fish and fish habitat was taken through Step 3 of The Protocol (Pilot, 2020) for the Tributary to Cote Martin Drain and the Drainage Culverts to the Tributary to Cote Martin Drain. The works at these locations can be addressed through the MTO BMPs for Bridge Maintenance, Like-for-Like Culvert Replacement, and Ditch Maintenance within 30 m of a Watercourse.

The assessment was taken to Step 4 of the Protocol for construction of the noise barrier wall adjacent to Cote Martin Drain (Pilot, 2020). Potential indirect impacts from Vegetation Clearing, Grading, Excavation, and Use of Industrial Equipment were assessed through the POEs, and after applying appropriate mitigation measures, no negative residual effects are anticipated.

Based on a review of the MTO BMPs, and POEs and relevant mitigation measures, it can be concluded that the proposed works at all watercourses are unlikely to result in the death of fish or HADD to fish habitat. As such, this project can proceed without a review by DFO or Authorization under the *Fisheries Act*. Upon acceptance of this assessment by MTO, the appropriate Project Notification Forms will be completed and submitted to MTO.

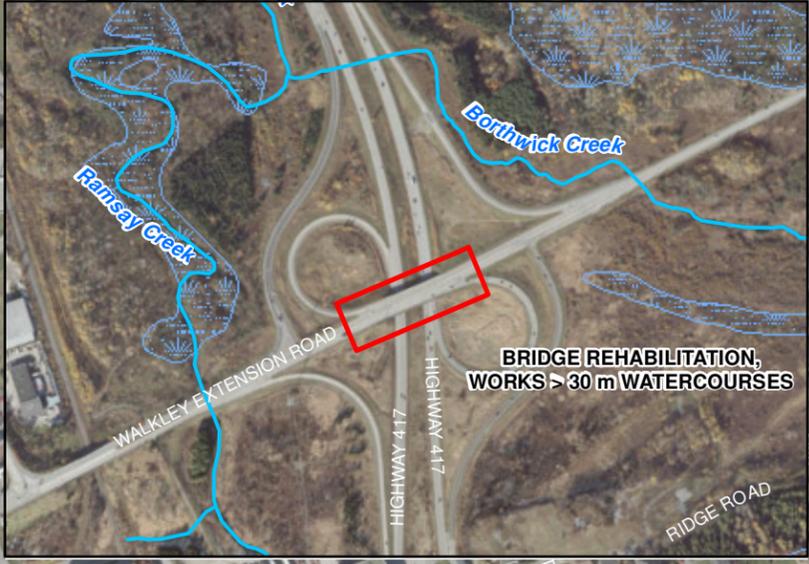
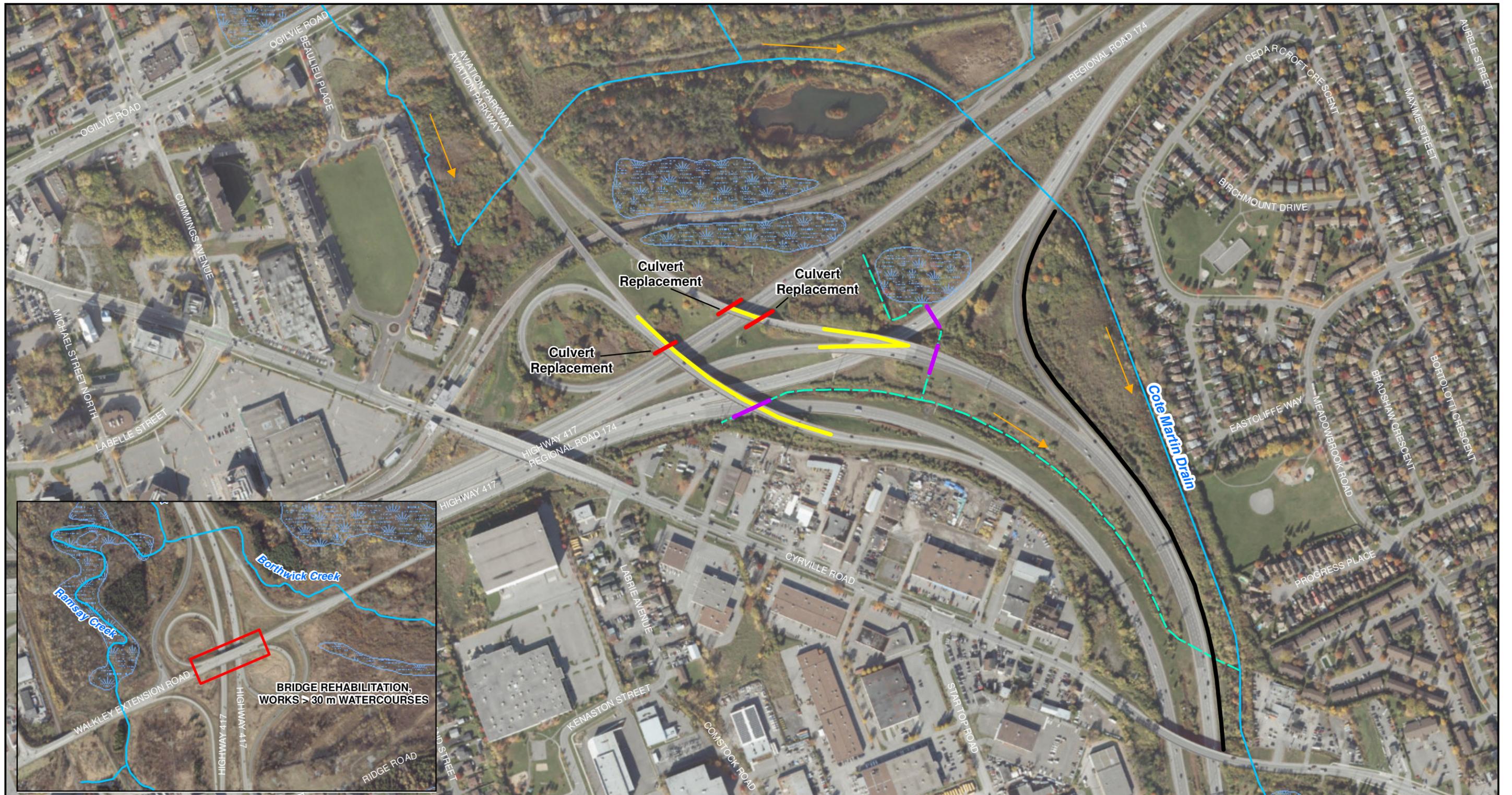
7 BIBLIOGRAPHY

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- McNaughton, J. February 27, 2018. Personal Communication with Jeff McNaughton, Fish and Wildlife Technical Specialist – MNR – Kemptville District
- Ministry of Transportation, 2020. Interim Environmental Guide for Fisheries - Best Management Practices Manual for Fisheries Manual. Environmental Policy Office, MTO.
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- Ontario Freshwater Fisheries Life History Database. Information obtained online at: <http://www.ontariofishes.ca/> - Accessed November 2017.
- WSP. 2019. Highway 417 Expansion, Ottawa Road 174 to Hunt Club Road. Draft Fish and Fish Habitat Existing Conditions Report.

APPENDIX

A

CONSTRAINTS MAPPING



126 DON HILLOCK DRIVE, UNIT 2
 AURORA, ONTARIO CANADA L4G 0G9
 TEL.: 905-750-3080 | FAX: 905-727-0463 | WWW.WSP.COM

LEGEND

- EXISTING CULVERT, LIKE-FOR-LIKE REPLACEMENT
- EXISTING CULVERT, NO PROPOSED WORK
- BRIDGE REHABILITATION
- NOISE WALL TO BE INSTALLED
- PERMANENT WATERCOURSE (WARM WATER)
- INTERMITTENT WATERCOURSE (WARM WATER)
- FLOW DIRECTION
- UNEVALUATED WETLAND



CLIENT: <p style="text-align: center;">MINISTRY OF TRANSPORTATION</p>	PROJECT NO: 17M-00850-01 470	DATE: DECEMBER 2021	TITLE: <p style="text-align: center;">FISH AND FISH HABITAT CONSTRAINTS AND PROPOSED WORKS</p>
PROJECT: <p style="text-align: center;">HIGHWAY 417: AVIATION PARKWAY BRIDGES AND WALKLEY ROAD UNDERPASS</p>	DESIGNED BY: -	DRAWN BY: T.P.	DISCIPLINE: <p style="text-align: center;">ENVIRONMENT</p>
CHECKED BY: -	FIGURE NO: 1	SCALE: 1:5,000	ISSUE: -
		REV.: -	

APPENDIX

B

REPRESENTATIVE
PHOTOGRAPHS



Photo 1: Culvert under Aviation Parkway NB bridge, south of OR174 WB lanes, culvert inlet, facing east. Date October 20th, 2021.



Photo 2: Culvert under Aviation Parkway NB bridge, south of OR174 WB lanes, culvert inlet, facing southeast. Date October 20th, 2021.



Photo 3: Culvert under Aviation Parkway NB bridge, south of OR174 WB lanes, culvert inlet, facing northeast. Date October 20th, 2021.



Photo 4: Culvert under Aviation Parkway NB bridge, south of OR174 WB lanes, culvert inlet, facing west. Date: October 20th, 2021.



Photo 5: Culvert under Aviation Parkway NB bridge, south of OR174 WB lanes, culvert outlet, facing east. Date October 20th, 2021.



Photo 6: Culvert under Aviation Parkway NB bridge, south of OR174 WB lanes, culvert outlet, facing east. Date October 20th, 2021.



Photo 7: Culvert under Aviation Parkway NB bridge, south of OR174 WB lanes, culvert outlet, facing west. Date October 20th, 2021.



Photo 8: Culvert under Aviation Parkway NB bridge, south of OR174 WB lanes, culvert outlet, facing east. Date October 20th, 2021.



Highway 417 Aviation Parkway to Hunt Club Rd.
REPRESENTATIVE PHOTOGRAPHS

Date: November 2021

Project No: 17M-00850-00

Figure No: #.1



Photo 9: Culvert under Aviation Parkway NB bridge, north of OR174 WB lanes, culvert outlet, facing west. Date October 20th, 2021.



Photo 10: Culvert under Aviation Parkway NB bridge, north of OR174 WB lanes, culvert outlet, facing east. Date October 20th, 2021.



Photo 11: Culvert under Aviation Parkway NB bridge, north of OR174 WB lanes, culvert outlet, facing northwest. Date October 20th, 2021.



Photo 12: Culvert under Aviation Parkway NB bridge, north of OR174 WB lanes, culvert outlet, facing southwest. Date October 20th, 2021.



Photo 13: Culvert under Aviation Parkway NB bridge, north of OR174 WB lanes, culvert inlet, facing west. Date October 20th, 2021.



Photo 14: Culvert under Aviation Parkway NB bridge, north of OR174 WB lanes, culvert inlet, facing east. Date October 20th, 2021.



Photo 15: Culvert under Aviation Parkway NB bridge, north of OR174 WB lanes, culvert inlet, facing southeast. Date October 20th, 2021.



Photo 16: Culvert under Aviation Parkway NB bridge, north of OR174 WB lanes, culvert inlet, facing northeast. Date October 20th, 2021.



Highway 417 Aviation Parkway to Hunt Club Rd.
REPRESENTATIVE PHOTOGRAPHS

Date: November 2021

Project No: 17M-00850-00

Figure No: #.2



Photo 17: Culvert under Aviation Parkway SB bridge, north of OR174 WB lanes, culvert outlet, facing west. Date October 20th, 2021.



Photo 18: Culvert under Aviation Parkway SB bridge, north of OR174 WB lanes, culvert outlet, facing northwest. Date October 20th, 2021.



Photo 19: Culvert under Aviation Parkway SB bridge, north of OR174 WB lanes, culvert outlet, facing southwest. Date October 20th, 2021.



Photo 20: Culvert under Aviation Parkway SB bridge, north of OR174 WB lanes, culvert outlet, facing east. Date October 20th, 2021.



Photo 21: Culvert under Aviation Parkway SB bridge, north of OR174 WB lanes, culvert inlet. Date October 20th, 2021.



Photo 22: Culvert under Aviation Parkway SB bridge, north of OR174 WB lanes, culvert inlet, facing west. Date October 20th, 2021.



Photo 23: Culvert under Aviation Parkway SB bridge, north of OR174 WB lanes, culvert inlet, facing northeast. Date October 20th, 2021.



Photo 24: Culvert under Aviation Parkway SB bridge, north of OR174 WB lanes, culvert inlet, facing north. Date October 20th, 2021.



Highway 417 Aviation Parkway to Hunt Club Rd.
REPRESENTATIVE PHOTOGRAPHS

Date: November 2021

Project No: 17M-00850-00

Figure No: #.3



Photo 25: 7-735C Cote Martin Drain culvert under OR174 EB on ramp, culvert outlet, facing south. Date October 20th, 2021.



Photo 26: 7-735C Cote Martin Drain culvert under OR174 EB on ramp, culvert outlet, facing east, showing erosion at wall. Date October 20th, 2021.



Photo 27: 7-735C Cote Martin Drain culvert under OR174 EB on ramp, culvert outlet, facing upstream inside culvert. Date October 20th, 2021.



Photo 28: 7-735C Cote Martin Drain culvert under OR174 EB on ramp, riffle habitat downstream of culvert outlet. Date October 20th, 2021.



Photo 29: 7-735C Cote Martin Drain culvert under OR174 EB on ramp, culvert outlet, facing upstream showing riffle habitat downstream of outlet. Date October 20th, 2021.



Photo 30: 7-735C Cote Martin Drain culvert under OR174 EB on ramp, run habitat downstream. Date October 20th, 2021.



Photo 31: 7-735C Cote Martin Drain culvert under OR174 EB on ramp, run habitat downstream. Date October 20th, 2021.



Photo 32: 7-735C Cote Martin Drain culvert under OR174 EB on ramp, run habitat downstream. Date October 20th, 2021.



Highway 417 Aviation Parkway to Hunt Club Rd.
REPRESENTATIVE PHOTOGRAPHS

Date: November 2021

Project No: 17M-00850-00

Figure No: #.4

APPENDIX

C HABITAT DATA SHEETS AND FIELD NOTES

WATERCOURSE FIELD COLLECTION FORM

GENERAL INFORMATION			
Project # 17M-00850-00	Project Description: Hwy 417 Aviation Parkway to Hunt Club Rd	Date: Oct. 20, 2021	
Is Stream Realignment required for this section: <input type="radio"/> Yes <input checked="" type="radio"/> No <input type="radio"/> Unknown			
Collectors: A. Rous; WSP Canada	Time Started: 16:40	Time Finished: 17:05	
Weather Conditions: Sunny, clear			
Air Temp (°C): 11°C	Water Temp (°C): 13°C	Conductivity (µS/cm): /	Velocity (m/s): /
Photos Numbers And Descriptions: 2546 - @culvert outlet look - south 2549 - Culvert outlet looking east 2550 - culvert outlet looking north 2551 - culvert outlet opening 2552 - D/S view from culvert outlet 2553 - U/S view of culvert outlet opening 2554 - bank erosion on left U/S bank 2555 - D/S view 2556 - D/S view 2558 - D/S view 2561 - D/S view			
LOCATION			
Name of Waterbody: Cote Martin Drain	Drainage System: Green's Creek	Crossing #: 3-735C	Station #: /
Location Of Crossing: Culvert under OR 174 EB lanes and EB on-ramp from Hwy 417			
GPS Coordinates: 45.42509, -75.61595	MTO Chainage: Unknown		
Township: City of Ottawa	MNR District: Kemptville		

LAND USE AND POLLUTION								
Surrounding Land Use: <i>Highway</i>				Sources of Pollution: <i>Highway</i>				
EXISTING STRUCTURE TYPE								
Bridge <input type="radio"/>		Box Culvert <input type="radio"/>		Open Foot Culvert <input checked="" type="radio"/>		CSP <input type="radio"/>		N/A <input type="radio"/>
Other <input type="radio"/> (Describe)				Size: (w x h) m ² <i>5.0m wide x 1.3m high</i>				
SECTION TYPE AND MORPHOLOGY								
Section (Reach) Identifier: <i>3-735C</i>				Section Location: (Include On Habitat Map) <i>Downstream</i>				
Associated Wetland <i>None</i>								
Stream / River <input checked="" type="radio"/>		Channelized <input type="radio"/>		Permanent <input checked="" type="radio"/>		Intermittent <input type="radio"/>		Ephemeral <input type="radio"/>
Total Section (Reach) Length (m):								
Sub-Sections:	Run <input type="radio"/>	Pool <input type="radio"/>	Riffle <input checked="" type="radio"/>	Flats <input checked="" type="radio"/>	Culvert <input type="radio"/>	Other <input type="radio"/>		
Percentage of Area:			<i>20%</i>	<i>80%</i>				
Mean wetted depth (m)			<i>0.10</i>	<i>0.35</i>				
Mean wetted width (m)			<i>3.9</i>	<i>2.8</i>				
Mean bankfull depth (m)			<i>1.0</i>	<i>1.0</i>				
Mean bankfull width (m)			<i>5.0</i>	<i>5.0</i>				
Substrate (type & %)			<i>70% Co 10% Sa 20% Gr</i>		<i>50% Si 10% D 30% Sa 10% Co</i>			
<i>Bedrock (Br)</i>	<i>Boulder (Bo)</i>	<i>Cobble (Co)</i>	<i>Gravel (Gr)</i>	<i>Sand (Sa)</i>	<i>Silt (Si)</i>	<i>Clay (Cl)</i>	<i>Muck (Mu)</i>	<i>Detritus (D)</i>

BANK STABILITY				
	Stable	Slightly Unstable	Moderately Unstable	Unstable
Left Bank	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
Right Bank	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
	Deposition Zone	Protected Bank	Vulnerable Bank	Eroding Bank
Left Bank	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
Right Bank	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
HABITAT				
In-Stream Cover (% surface area):				
Undercut banks: <i>5%</i>	Boulders: <i>0%</i>	Cobbles: <i>10%</i>	Organic Debris: <i>5%</i>	None <input type="radio"/>
Vascular Macrophytes: <i>20%</i>		Woody Debris: <i>10%</i>		
Instream: <i>None</i>		Instream: <i>Small branches</i>		
Overhanging: <i>Grasses; Cattails</i>		Overhanging: <i>Alders; Buckthorn</i>		
Shore Cover (% stream shaded):				
100-90% <input type="radio"/>	89-60% <input type="radio"/>	59-30% <input checked="" type="radio"/>	29-1% <input type="radio"/>	None <input type="radio"/>
Vegetation Type:				
Vegetation Type (%)	Submergent: <i>10%</i>	Floating: <i>0%</i>	Emergent: <i>0%</i>	None <input type="radio"/>
Predominant Species:	<i>Pondweed Sp.</i>	<i>/</i>	<i>/</i>	

MIGRATORY OBSTRUCTIONS

Permanent <i>None observed</i>	Seasonal <i>None observed</i>	None 
-----------------------------------	----------------------------------	---------------------------------------------------------------------------------------------

POTENTIAL CRITICAL HABITAT

Spawning <i>Possible</i>	Groundwater <i>None observed</i>	Other 
-----------------------------	-------------------------------------	----------------------------------------------------------------------------------------------

POTENTIAL ENHANCEMENT OPPORTUNITIES

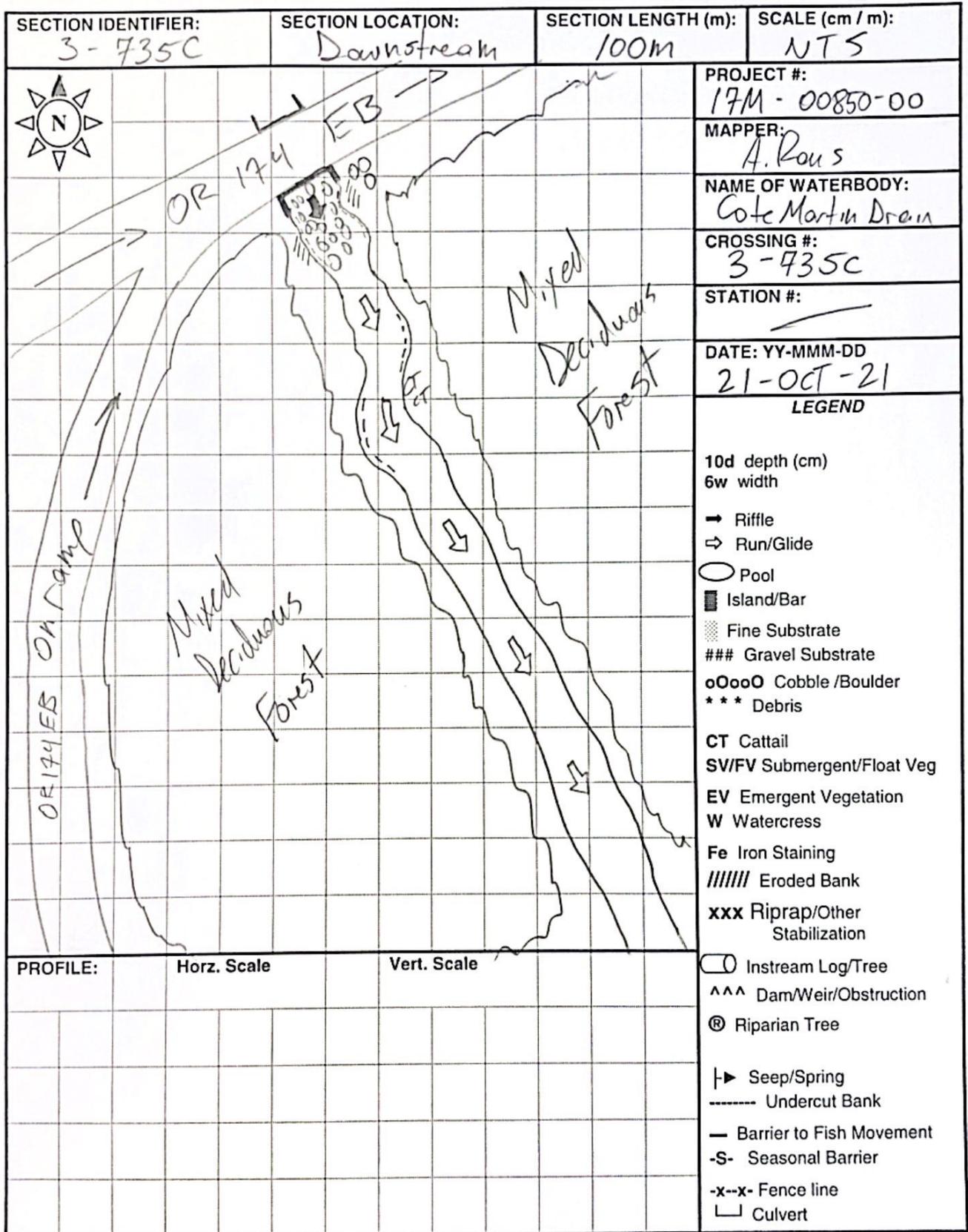
None

ADDITIONAL COMMENTS

- overall, good quality fish habitat
- noticed morphology
- evidence of minnows due to minnow trap left in creek

Additional Notes Appended? No Yes

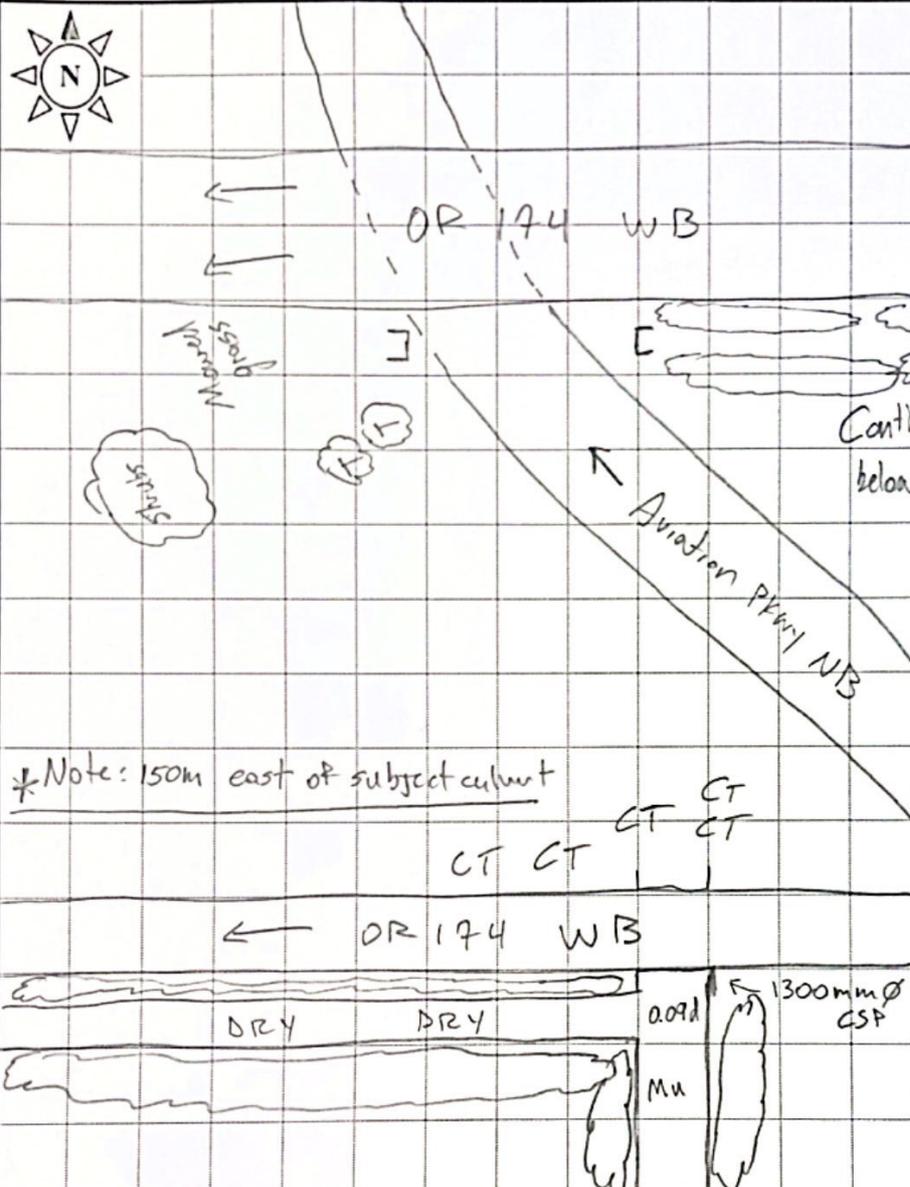
Number of Pages 4



LAND USE AND POLLUTION								
Surrounding Land Use: <i>Highway</i>				Sources of Pollution: <i>Highway</i>				
EXISTING STRUCTURE TYPE								
Bridge <input type="radio"/>	Box Culvert <input type="radio"/>	Open Foot Culvert <input type="radio"/>		CSP <input checked="" type="radio"/>	N/A <input type="radio"/>			
Other <input type="radio"/> (Describe)				Size: (w x h) m ² <i>750 mm Ø</i>				
SECTION TYPE AND MORPHOLOGY								
Section (Reach) Identifier: <i>CU 1</i>				Section Location: (Include On Habitat Map) <i>Upstream & Downstream</i>				
Associated Wetland <i>None</i>								
Stream / River <input type="radio"/>	Channelized <input checked="" type="radio"/>	Permanent <input type="radio"/>	Intermittent <input type="radio"/>	Ephemeral <input checked="" type="radio"/>				
Total Section (Reach) Length (m): <i>25m upstream / 50m downstream</i>								
Sub-Sections:	Run <input type="radio"/>	Pool <input type="radio"/>	Riffle <input type="radio"/>	Flats <input type="radio"/>	Culvert <input type="radio"/>	Other <input checked="" type="radio"/>		
Percentage of Area:						<i>Roadside Ditch 100%</i>		
Mean wetted depth (m)						<i>N/A dry</i>		
Mean wetted width (m)						<i>N/A dry</i>		
Mean bankfull depth (m)						<i>0.30</i>		
Mean bankfull width (m)						<i>2.0</i>		
Substrate (type & %)						<i>Vegetated soil</i>		
Bedrock (Br)	Boulder (Bo)	Cobble (Co)	Gravel (Gr)	Sand (Sa)	Silt (Si)	Clay (Cl)	Muck (Mu)	Detritus (D)

BANK STABILITY				
	Stable	Slightly Unstable	Moderately Unstable	Unstable
Left Bank	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Right Bank	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	Deposition Zone	Protected Bank	Vulnerable Bank	Eroding Bank
Left Bank	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Right Bank	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
HABITAT				
In-Stream Cover (% surface area):				
Undercut banks:	Boulders:	Cobbles:	Organic Debris:	None
None	None	None	None	<input checked="" type="radio"/>
Vascular Macrophytes:			Woody Debris: None	
Instream: River bank grape; buckthorn; grasses; goldenrods			Instream:	
Overhanging: Glossy aul common buckthorn			Overhanging:	
Shore Cover (% stream shaded):				
100-90%	89-60%	59-30%	29-1%	None
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
Vegetation Type:				
Vegetation Type (%)	Submergent:	Floating:	Emergent:	None
	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>
Predominant Species:				

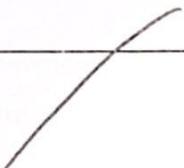
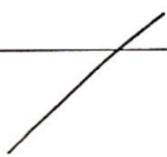
MIGRATORY OBSTRUCTIONS		
Permanent	Seasonal Ephemeral flow only	None
POTENTIAL CRITICAL HABITAT		
Spawning None	Groundwater None	Other 
POTENTIAL ENHANCEMENT OPPORTUNITIES		
None		
ADDITIONAL COMMENTS		
<ul style="list-style-type: none"> - Road side drainage ditch - West section dominated by mowed grass - East section dominated by invasive buckthorn and tall grasses. - Dry drainage ditch meets wetted trib (under OR 144), approx. 150 m east of ^{subject} culvert. (See photos IMG-2361 - 2366) [1300mm Ø CSP] 		
Additional Notes Appended? <input checked="" type="radio"/> No <input type="radio"/> Yes		Number of Pages <u>4</u>

SECTION IDENTIFIER: CV 1		SECTION LOCATION: U/S & D/S		SECTION LENGTH (m): U/S: 25m D/S: 150m		SCALE (cm / m): NTS	
						PROJECT #: 17M-00850-00	
						MAPPER: A. Pous	
						NAME OF WATERBODY: N/A	
						CROSSING #: /	
						STATION #: /	
DATE: YY-MMM-DD 21-OCT-20						<p>LEGEND</p> <p>10d depth (cm) 6w width</p> <p>➔ Riffle ⇨ Run/Glide ○ Pool ▬ Island/Bar ▨ Fine Substrate ### Gravel Substrate oOooO Cobble/Boulder *** Debris</p> <p>CT Cattail SV/FV Submergent/Float Veg EV Emergent Vegetation W Watercross Fe Iron Staining ///// Eroded Bank xxx Riprap/Other Stabilization</p> <p>○ Instream Log/Tree ^^^ Dam/Weir/Obstruction ⊗ Riparian Tree └▶ Seep/Spring ----- Undercut Bank - Barrier to Fish Movement -S- Seasonal Barrier -x-x- Fence line ┌└ Culvert</p>	
PROFILE:		Horz. Scale		Vert. Scale			

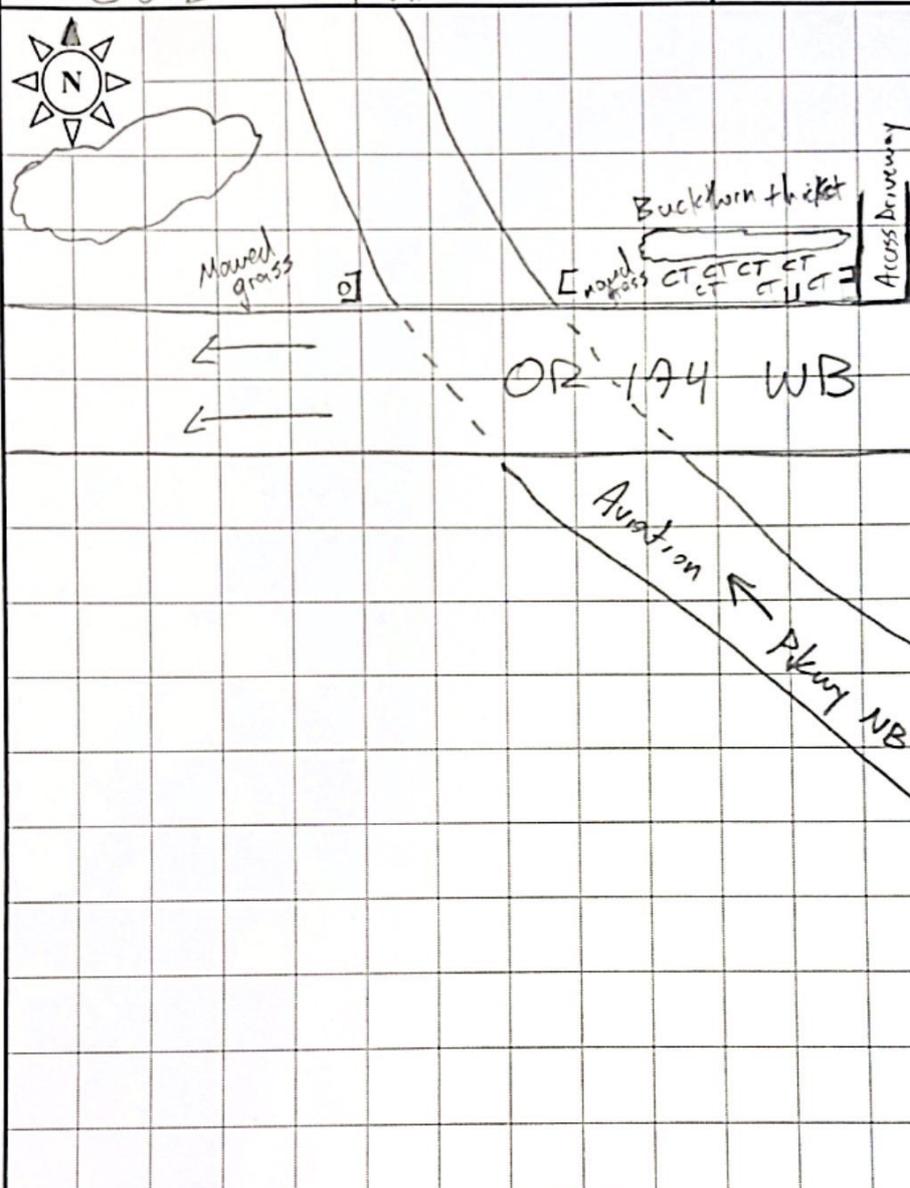
WATERCOURSE FIELD COLLECTION FORM

GENERAL INFORMATION			
Project # 17M-00850-00	Project Description: Hwy 417 Aviation Parkway to Hunt Club Rd.		Date: Oct. 20, 2021
Is Stream Realignment required for this section: <input type="radio"/> Yes <input checked="" type="radio"/> No <input type="radio"/> Unknown			
Collectors: A. Rous; WSP Canada	Time Started: 12:20	Time Finished: 12:35	
Weather Conditions: Sunny, Clear			
Air Temp (°C): 13°C	Water Temp (°C): N/A	Conductivity (µS/cm): N/A	Velocity (m/s): N/A
Photos Numbers And Descriptions: IMG- 2374 - 2387 2374 - East end of culvert looking west 2381 - Damage to top of culvert 2375 - East end of culvert looking east 2382 - Damage to top of culvert 2376 - East end of culvert 2383 - West end of culvert 2377 - East end of culvert looking north west 2384 - West end of culvert looking west 2378 - East end of culvert looking south west 2385 - West end of culvert looking east 2379 - East end of culvert looking east 2386 - West end of culvert looking southeast 2380 - Damage to top of culvert 2387 - West end of culvert looking north			
LOCATION			
Name of Waterbody: N/A	Drainage System: Cote Martin Drain	Crossing #: /	Station #: /
Location Of Crossing: Culvert under north side of NB Aviation Parkway Bridge (parallel with OR174 WB lanes)			
GPS Coordinates: 45.42385, -75.62163		MTO Chainage: Unknown	
Township: City of Ottawa		MNR District: Kemptville	

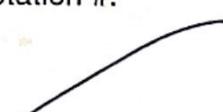
LAND USE AND POLLUTION										
Surrounding Land Use: <i>Highway</i>					Sources of Pollution: <i>Highway</i>					
EXISTING STRUCTURE TYPE										
Bridge <input type="radio"/>		Box Culvert <input type="radio"/>		Open Foot Culvert <input type="radio"/>		CSP <input checked="" type="radio"/>		N/A <input type="radio"/>		
Other <input type="radio"/> (Describe)					Size: (w x h) m ² <i>750 mm Ø</i>					
SECTION TYPE AND MORPHOLOGY										
Section (Reach) Identifier: <i>CU 2</i>					Section Location: (Include On Habitat Map) <i>Upstream & Downstream</i>					
Associated Wetland <i>None</i>										
Stream / River <input type="radio"/>		Channelized <input checked="" type="radio"/>		Permanent <input type="radio"/>		Intermittent <input type="radio"/>		Ephemeral <input checked="" type="radio"/>		
Total Section (Reach) Length (m): <i>25m upstream / 100m downstream</i>										
Sub-Sections:										
Run <input type="radio"/>		Pool <input type="radio"/>		Riffle <input type="radio"/>		Flats <input type="radio"/>		Culvert <input type="radio"/>		Other <input checked="" type="radio"/>
Percentage of Area:										<i>Roadside Ditch 100%</i>
Mean wetted depth (m)										<i>N/A dry</i>
Mean wetted width (m)										<i>N/A dry</i>
Mean bankfull depth (m)										<i>0.30</i>
Mean bankfull width (m)										<i>2.0</i>
Substrate (type & %)										<i>Vegetated Soil</i>
<i>Bedrock (Br)</i>	<i>Boulder (Bo)</i>	<i>Cobble (Co)</i>	<i>Gravel (Gr)</i>	<i>Sand (Sa)</i>	<i>Silt (Si)</i>	<i>Clay (Cl)</i>	<i>Muck (Mu)</i>	<i>Detritus (D)</i>		

BANK STABILITY				
	Stable	Slightly Unstable	Moderately Unstable	Unstable
Left Bank	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Right Bank	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	Deposition Zone	Protected Bank	Vulnerable Bank	Eroding Bank
Left Bank	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Right Bank	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
HABITAT				
In-Stream Cover (% surface area):				
Undercut banks: <i>None</i>	Boulders: <i>None</i>	Cobbles: <i><5%</i>	Organic Debris: <i>None</i>	None <input checked="" type="radio"/>
Vascular Macrophytes: Instream: <i>grasses; cattails; buckthorn</i> Overhanging: <i>buckthorn</i>		Woody Debris: <i>None</i> Instream:  Overhanging: 		
Shore Cover (% stream shaded):				
100-90% <input type="radio"/>	89-60% <input type="radio"/>	59-30% <input type="radio"/>	29-1% <input checked="" type="radio"/>	None <input type="radio"/>
Vegetation Type:				
Vegetation Type (%)	Submergent: 	Floating: 	Emergent: <i>15%</i>	None <input type="radio"/>
Predominant Species:			<i>Cattails</i>	

MIGRATORY OBSTRUCTIONS		
Permanent	Seasonal Ephemeral Flows only	None
POTENTIAL CRITICAL HABITAT		
Spawning None	Groundwater None	Other 
POTENTIAL ENHANCEMENT OPPORTUNITIES		
None		
ADDITIONAL COMMENTS		
<ul style="list-style-type: none"> - Roadside Drainage ditch - West section dominated by mowed grass - East section dominated by cattail ditch w buckthorn thicket - Approx. 30m east of subject culvert, there is a concrete culvert outlet to ditch that run N-S under OR 174 WB lanes. - Approx. 50 m east of subject culvert, there is a 750m Ø CSP running E-W under access drive way - Approx. 200m east of subject culvert, there is a ^{small} cattail marsh and CSP culvert under OR 174, heading ^{south} to trib/ channel. 		
Additional Notes Appended? <input checked="" type="radio"/> No <input type="radio"/> Yes		Number of Pages <u>4</u>

SECTION IDENTIFIER: <i>CU 2</i>		SECTION LOCATION: <i>UIS & DIS</i>		SECTION LENGTH (m): <i>UIS: 25m DS: 150m</i>		SCALE (cm / m): <i>NTS</i>	
						PROJECT #: <i>17M-00850-00</i>	
						MAPPER: <i>A. Pous</i>	
						NAME OF WATERBODY: <i>N/A</i>	
						CROSSING #: /	
STATION #: /						DATE: YY-MMM-DD <i>21-OCT-20</i>	
						<p>LEGEND</p> <p>10d depth (cm) 6w width</p> <ul style="list-style-type: none"> ➔ Riffle ⇒ Run/Glide ○ Pool ▒ Island/Bar ⋯ Fine Substrate ### Gravel Substrate oOooO Cobble /Boulder *** Debris CT Cattail SV/FV Submergent/Float Veg EV Emergent Vegetation W Watercress Fe Iron Staining ///// Eroded Bank xxx Riprap/Other Stabilization ○ Instream Log/Tree ^^^ Dam/Weir/Obstruction ⊗ Riparian Tree └▶ Seep/Spring ----- Undercut Bank — Barrier to Fish Movement -S- Seasonal Barrier -x-x- Fence line ┌ Culvert 	
PROFILE:		Horz. Scale		Vert. Scale			

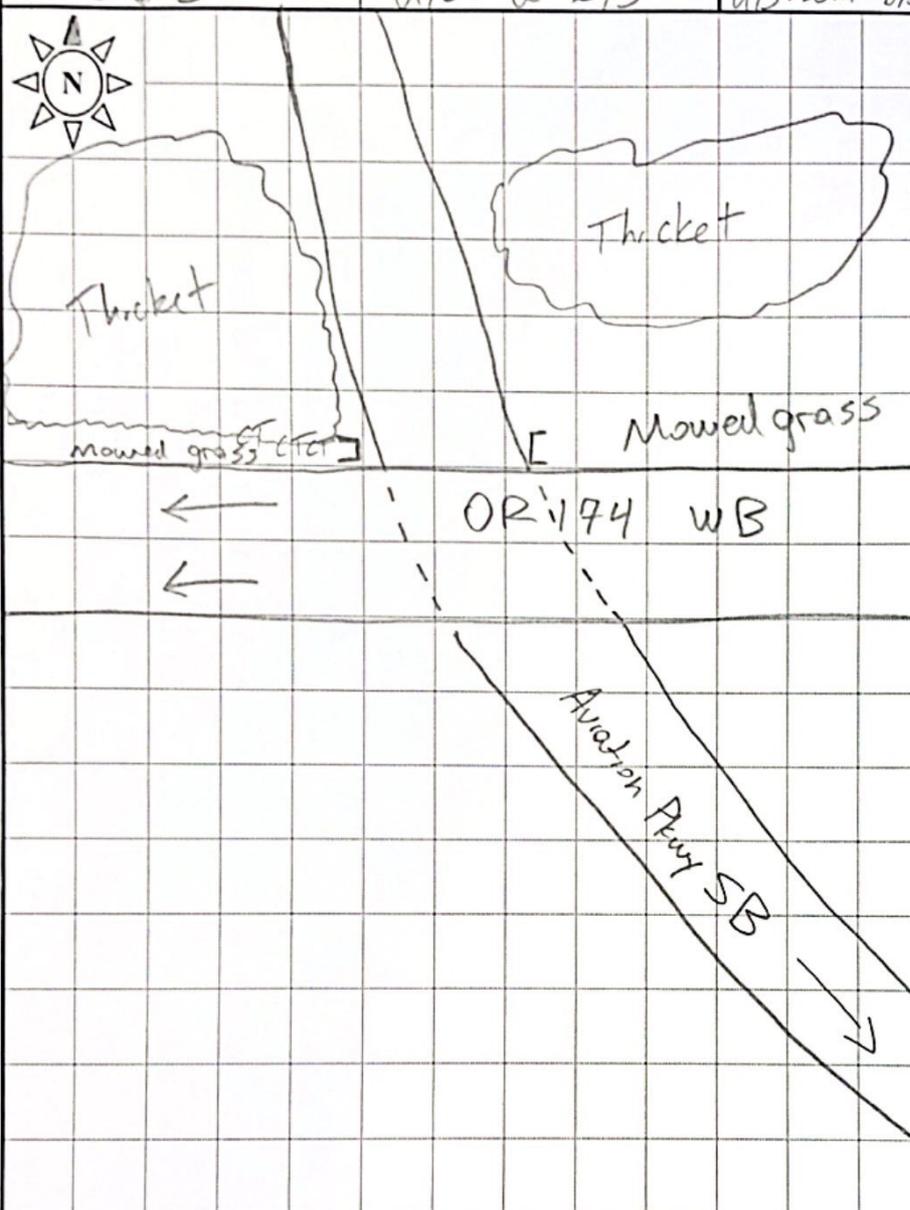
WATERCOURSE FIELD COLLECTION FORM

GENERAL INFORMATION			
Project # 17M-00850-00	Project Description: Hwy 417 Aviation Parkway to Hunt Club Rd.		Date: Oct. 20, 2021
Is Stream Realignment required for this section: <input type="radio"/> Yes <input checked="" type="radio"/> No <input type="radio"/> Unknown			
Collectors: A. Pous; WSP Canada	Time Started: 12:35	Time Finished: 12:50	
Weather Conditions: Sunny, Clear			
Air Temp (°C): 13°C	Water Temp (°C): N/A	Conductivity (µS/cm): N/A	Velocity (m/s): N/A
Photos Numbers And Descriptions: IMG-2388 - 2398 2388- East end looking west 2389- East end looking north 2390- East end looking south west 2391- East end of culvert 2392- East end looking east 2393- West end of culvert 2394- West end looking west 2395- West end looking east 2396- West end looking west 2397- West end looking north 2398- cattail marsh north west @ EB off ramp			
LOCATION			
Name of Waterbody: N/A	Drainage System: Cote Martin Drain	Crossing #: 	Station #: 
Location Of Crossing: Culvert under north side of SB Aviation Pkwy Bridge			
GPS Coordinates: 45.42340, -75.62270		MTO Chainage: Unknown	
Township: City of Ottawa		MNR District: Kemptville	

LAND USE AND POLLUTION								
Surrounding Land Use: <i>Highway</i>				Sources of Pollution: <i>Highway</i>				
EXISTING STRUCTURE TYPE								
Bridge <input type="radio"/>	Box Culvert <input type="radio"/>	Open Foot Culvert <input type="radio"/>			CSP <input checked="" type="radio"/>	N/A <input type="radio"/>		
Other <input type="radio"/> (Describe)				Size: (w x h) m ² <i>750 mm Ø</i>				
SECTION TYPE AND MORPHOLOGY								
Section (Reach) Identifier: <i>CV 3</i>				Section Location: (Include On Habitat Map) <i>Upstream & Downstream</i>				
Associated Wetland <i>Cattail marsh</i>								
Stream / River <input type="radio"/>	Channelized <input checked="" type="radio"/>	Permanent <input type="radio"/>	Intermittent <input type="radio"/>	Ephemeral <input checked="" type="radio"/>				
Total Section (Reach) Length (m): <i>25m upstream / 100 downstream</i>								
Sub-Sections:	Run <input type="radio"/>	Pool <input type="radio"/>	Riffle <input type="radio"/>	Flats <input type="radio"/>	Culvert <input type="radio"/>	Other <input checked="" type="radio"/>		
Percentage of Area:						<i>Roadside Ditch 100%</i>		
Mean wetted depth (m)						<i>N/A dry</i>		
Mean wetted width (m)						<i>N/A dry</i>		
Mean bankfull depth (m)						<i>0.30</i>		
Mean bankfull width (m)						<i>2.0</i>		
Substrate (type & %)						<i>Vegetated soil</i>		
<i>Bedrock (Br)</i>	<i>Boulder (Bo)</i>	<i>Cobble (Co)</i>	<i>Gravel (Gr)</i>	<i>Sand (Sa)</i>	<i>Silt (Si)</i>	<i>Clay (Cl)</i>	<i>Muck (Mu)</i>	<i>Detritus (D)</i>

BANK STABILITY				
	Stable	Slightly Unstable	Moderately Unstable	Unstable
Left Bank	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Right Bank	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	Deposition Zone	Protected Bank	Vulnerable Bank	Eroding Bank
Left Bank	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Right Bank	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
HABITAT				
In-Stream Cover (% surface area):				
Undercut banks:	Boulders:	Cobbles:	Organic Debris:	None
None	None	< 5%	None	<input type="radio"/>
Vascular Macrophytes:		Woody Debris: None		
Instream: Grasses; cat-tails; buck-thorn		Instream:		
Overhanging: Buck thorn		Overhanging:		
Shore Cover (% stream shaded):				
100-90%	89-60%	59-30%	29-1%	None
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
Vegetation Type:				
Vegetation Type (%)	Submergent:	Floating:	Emergent:	None
			15%	<input type="radio"/>
Predominant Species:			Cat tails	

MIGRATORY OBSTRUCTIONS		
Permanent	Seasonal <i>Ephemeral flows only</i>	None
POTENTIAL CRITICAL HABITAT		
Spawning <i>None</i>	Groundwater <i>None</i>	Other 
POTENTIAL ENHANCEMENT OPPORTUNITIES		
<i>None</i>		
ADDITIONAL COMMENTS		
<ul style="list-style-type: none"> - Roadside drainage ditch - East section dominated by mowed grass - West section is a mix of mowed grass and cattail/buckhorn thicket channel 		
Additional Notes Appended? <input checked="" type="radio"/> No <input type="radio"/> Yes		Number of Pages <u>4</u>

SECTION IDENTIFIER: CV 3		SECTION LOCATION: W/S & D/S		SECTION LENGTH (m): U/S: 25m D/S: 100m		SCALE (cm / m): NTS	
						PROJECT #: 17M-00850-00	
						MAPPER: A. Pous	
						NAME OF WATERBODY: N/A	
						CROSSING #: _____	
						STATION #: _____	
DATE: YY-MMM-DD 21-OCT-20						<p align="center">LEGEND</p> <p>10d depth (cm) 6w width</p> <ul style="list-style-type: none"> ➔ Riffle ⇨ Run/Glide ○ Pool ■ Island/Bar • Fine Substrate ### Gravel Substrate oOooO Cobble/Boulder *** Debris CT Cattail SV/FV Submergent/Float Veg EV Emergent Vegetation W Watercress Fe Iron Staining ///// Eroded Bank xxx Riprap/Other Stabilization ○ Instream Log/Tree ^^^ Dam/Weir/Obstruction Ⓜ Riparian Tree ┆ Seep/Spring ----- Undercut Bank — Barrier to Fish Movement -S- Seasonal Barrier -x-x- Fence line ┌ Culvert 	
PROFILE:		Horz. Scale		Vert. Scale			

APPENDIX

D CONSTRUCTION DRAWINGS



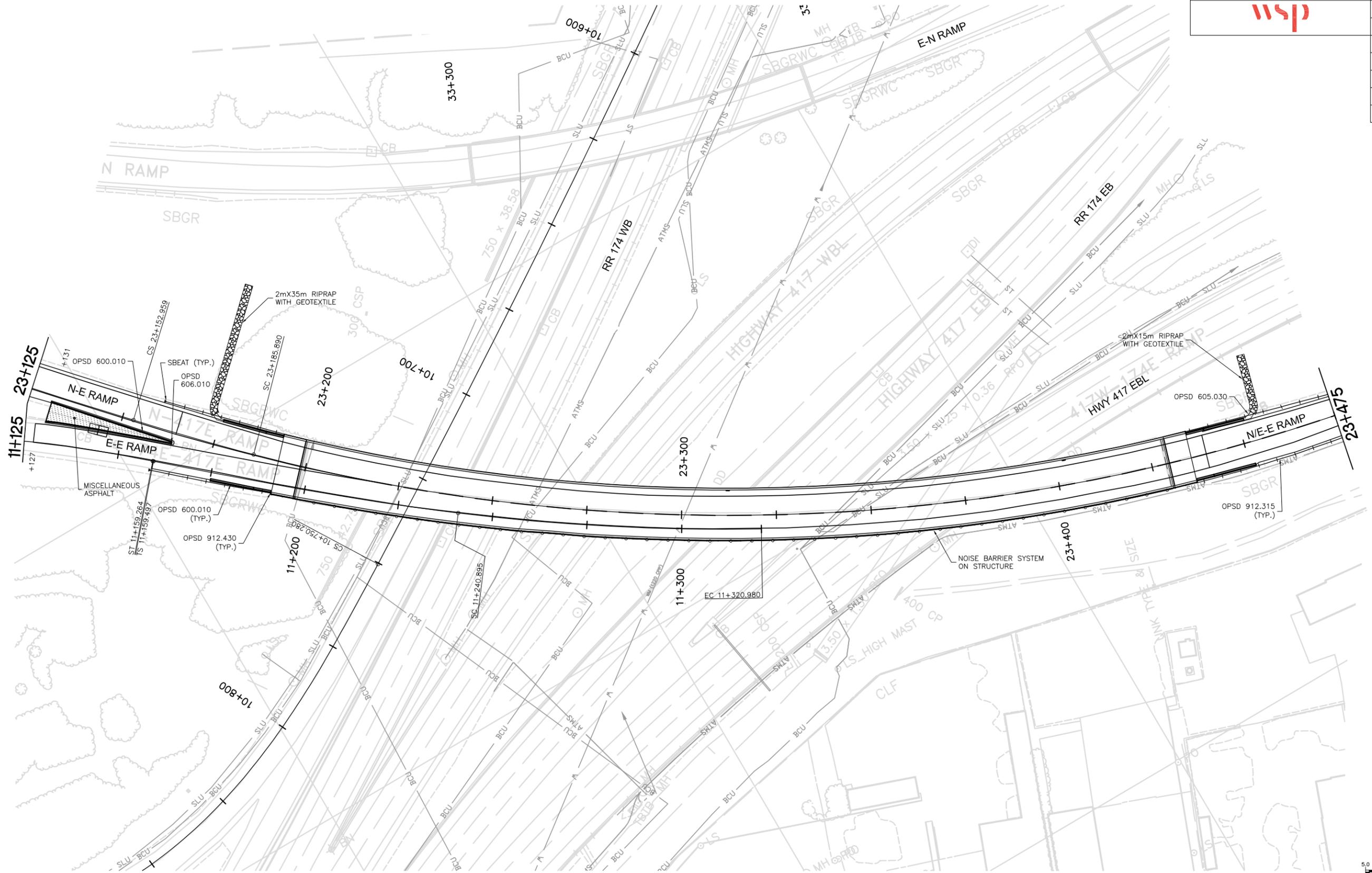
METRIC

PLATE No
CONT No X
WP No 4074-11-01



AVIATION BRIDGE SB-NEW CONSTRUCTION
STA 23+125 TO STA 23+475
Survey Revised

SHEET
146

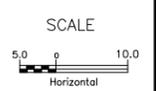


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DRAWN BY: J.F.
MODIFIED: 21/05/20 09:27:45

Revised

MINISTRY OF TRANSPORTATION, ONTARIO
PR-0-307

88-05



DISTRICT CONT. No. WP No.	 SHEET 185
OTTAWA RD 174 AVIATION PARKWAY SB REHABILITATION	
GENERAL ARRANGEMENT	METRIC

GENERAL NOTES:

- CLASS OF CONCRETE

CLASS OF CONCRETE	
DECK	35 MPa.
REMAINDER	30 MPa.
- CLEAR COVER TO REINFORCING STEEL

DECK: TOP	70±20
BOTTOM	50±10
REMAINDER UNLESS OTHERWISE NOTED	70±20
CLEAR COVER TO REINFORCING STAINLESS STEEL	60±10
- REINFORCING STEEL

REINFORCING STEEL SHALL BE GRADE 400W.

UNLESS SHOWN OTHERWISE, TENSION LAP SPLICES FOR REINFORCING STEEL BARS SHALL BE CLASS B.

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.

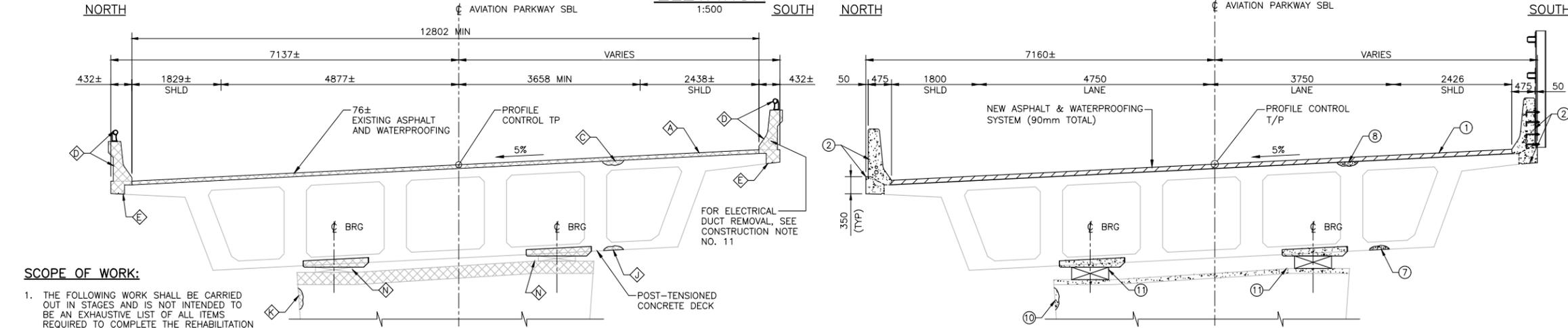
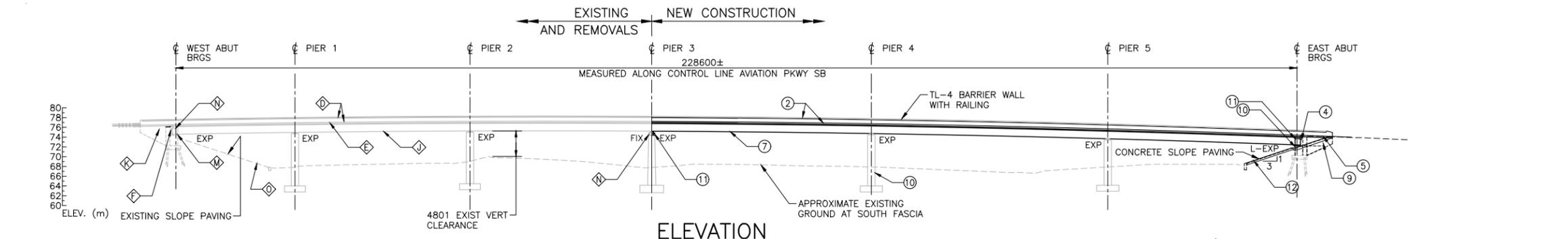
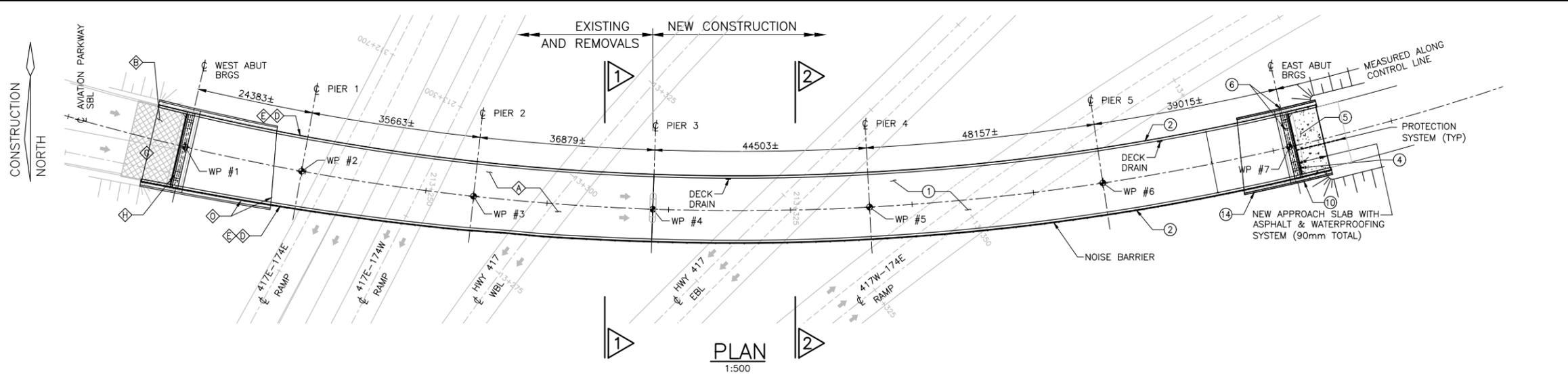
BAR HOOKS SHALL HAVE STANDARD HOOK DIMENSIONS USING MINIMUM BEND DIAMETERS, WHILE STIRRUPS AND TIES SHALL HAVE MINIMUM HOOK DIMENSIONS. ALL HOOKS SHALL BE IN ACCORDANCE WITH THE STRUCTURAL STANDARD DRAWING SS12-1, UNLESS INDICATED OTHERWISE.

CONSTRUCTION NOTES:

- DETAILS, DIMENSIONS AND ELEVATIONS SHOWN FOR THE EXISTING STRUCTURE ARE THEORETICAL AND HAVE BEEN ESTABLISHED FROM THE ORIGINAL STRUCTURE DRAWINGS. THE CONTRACTOR SHALL CONFIRM THESE DETAILS, DIMENSIONS AND ELEVATIONS THROUGH DETAILED SURVEY AND FIELD MEASUREMENT OF THE EXISTING STRUCTURE AND SHALL REPORT ANY DISCREPANCIES TO THE CONTRACT ADMINISTRATOR BEFORE PROCEEDING WITH THE WORK.
- NO BACKFILL SHALL BE PLACED BEHIND THE ABUTMENTS AND WINGWALLS UNTIL THE CONCRETE IN THESE COMPONENTS HAS REACHED 75% OF ITS DESIGN STRENGTH.
- TEMPORARY SUPPORT AT PIERS ARE REQUIRED DURING BEARING REPLACEMENT AND INSTALLATION.
- SAWCUTS IN CONCRETE, WHERE DESIGNATED, SHALL BE 25 mm DEEP OR TO THE FIRST LAYER OF REINFORCING STEEL, WHICHEVER IS LESS.
- THE CONTRACTOR IS RESPONSIBLE FOR THE DESIGN AND INSTALLATION OF ALL DEBRIS CONTAINMENT SYSTEMS.
- ALL MATERIAL SHALL BE IN ACCORDANCE WITH MTO DESIGNATED SOURCES FOR MATERIALS (DSM).
- THE CONTRACTOR SHALL LOCATE AND PROTECT ALL UTILITIES DURING CONSTRUCTION OPERATIONS.
- STABILITY AND INTEGRITY OF THE STRUCTURE SHALL BE MAINTAINED AT ALL STAGES OF CONSTRUCTION.
- ALL EXPOSED EDGES TO RECEIVE A 20x20 CHAMFER.
- ALL AREAS AFFECTED BY CONSTRUCTION ACTIVITIES SHALL BE FULLY REINSTATED TO PRE-CONSTRUCTION OR BETTER CONDITIONS TO THE SATISFACTION OF THE CONTRACT ADMINISTRATOR.
- HAZARDOUS MATERIALS ARE PRESENT IN THE FOLLOWING:
 - ELECTRICAL DUCTS CONTAIN ASBESTOS

APPLICABLE STANDARD DRAWINGS:

OPSD 3101.150	WALLS-ABUTMENT, BACKFILL MINIMUM GRANULAR REQUIREMENT
OPSD 3349.101	DECK, DRAINS DRAINAGE OF EXISTING DECK BELOW ASPHALT WEARING SURFACE
OPSD 3370.100	DECK, WATERPROOFING HOT APPLIED ASPHALT MEMBRANE WITH PROTECTION BOARD
OPSD 3370.101	DECK, WATERPROOFING HOT APPLIED ASPHALT MEMBRANE AT ACTIVE CRACKS GREATER THAN 2 mm WIDE AND CONSTRUCTION JOINTS
OPSD 3419.100	BARRIERS AND RAILINGS-STEEL GUIDE RAIL AND CHANNEL ANCHORAGE



SCOPE OF WORK:

- THE FOLLOWING WORK SHALL BE CARRIED OUT IN STAGES AND IS NOT INTENDED TO BE AN EXHAUSTIVE LIST OF ALL ITEMS REQUIRED TO COMPLETE THE REHABILITATION WORK, NOR IS IT INTENDED TO PROVIDE A SEQUENCE OF CONSTRUCTION ACTIVITIES.
- THE CONTRACTOR SHALL INSTALL TRAFFIC CONTROL SIGNAGE AND WORKER PROTECTION SYSTEMS PRIOR TO THE COMMENCEMENT OF THE WORK.

REMOVALS:

- REMOVE EXISTING ASPHALT AND WATERPROOFING FROM DECK
- REMOVE EXISTING ASPHALT FROM APPROACHES
- REMOVE DETERIORATED CONCRETE FROM DECK TOP
- REMOVE BARRIER WALLS WITH RAILING
- REMOVE DECK FASCIA
- REMOVE BALLAST WALLS AND TOP PORTION OF CLEATS
- REMOVE APPROACH SLABS
- REMOVE EXPANSION JOINT ASSEMBLIES
- REMOVE DETERIORATED CONCRETE FROM SOFFIT
- REMOVE TOP PART OF WINGWALLS
- REMOVE DETERIORATED CONCRETE FROM SUBSTRUCTURE
- REMOVE DETERIORATED CONCRETE FROM BRIDGE ENDS
- REMOVE BEARINGS AND PORTION OF TOP OF BEARING SEATS AT ABUTMENTS AND PIERS
- REMOVE DAMAGED CONCRETE SLOPE PAVING
- REMOVE EXIST DECK DRAINS

NEW CONSTRUCTION:

- PLACE WATERPROOFING ON THE DECK AND PAVE THE DECK AND APPROACHES
- CONSTRUCT NEW BARRIER WALLS WITH SNOW FENCE AND DECK FASCIA
- REPAIR DECK ENDS
- RECONSTRUCT NEW BALLAST WALLS AND TOP PORTION OF CLEAT
- CONSTRUCT NEW APPROACH SLABS
- INSTALL NEW EXPANSION JOINT ASSEMBLIES WITH EXTERIOR JOINTS DRAINAGE SYSTEM
- REPAIR DECK SOFFIT
- REPAIR DECK TOP
- RECONSTRUCT TOP OF WINGWALL. EMBED CATHODIC PROTECTION AND PATCH (FORM & PUMP).
- PATCH REPAIR SUBSTRUCTURE, REMOVE DETERIORATED CONCRETE FROM ABUTMENTS' FACES, EMBED GALVANIC CP AND REFAC ABUTMENTS
- RECONSTRUCT TOP OF BEARING SEATS AT ABUTMENTS AND PIERS AND REPLACE ABUTMENTS AND PIERS BEARINGS
- CONSTRUCT NEW CONCRETE SLOPE PAVING

LIST OF DRAWINGS:

- GENERAL ARRANGEMENT
- CONSTRUCTION STAGING
- JACKING AND BEARINGS DETAILS I
- JACKING AND BEARINGS DETAILS II
- REMOVALS
- NEW CONSTRUCTION I
- NEW CONSTRUCTION II
- BARRIER WALL W/O RAILING, TL-5
- NOISE BARRIER DETAILS
- APPROACH SLABS
- STRIP SEAL EXPANSION JOINT ASSEMBLY FOR BARRIER WALLS - WITH DRAINAGE SYSTEM
- STRIP SEAL EXPANSION JOINT TYPE 'A' - DETAILS
- EXPANSION JOINT DRAINAGE SYSTEM CATCH BASIS AND DOWNPIPE - DETAILS
- CONCRETE SLOPE PAVING
- STANDARD DETAILS
- ELECTRICAL EMBEDDED WORK

LEGEND:

- REMOVALS
- NEW CONCRETE
- NEW ASPHALT

LIST OF ABBREVIATIONS:

- FIX FIXED
- EXP EXPANSION
- L-EXP LIMITED EXPANSION
- SHLD SHOULDER
- WP WORKING POINT

PRELIMINARY
27 AUG 2021
NOT FOR CONSTRUCTION

DATE	BY	DESCRIPTION
DESIGN SZ	CHK MZ	CODE CHBDC-14 LOAD CL-625-ONT
DRAWN ET	CHK SZ	SITE 03X-0303/B1

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 MODIFIED: 8/26/2021 10:05:33 AM BY: C4F071451
 DATE PLOTTED: 8/27/2021 10:07:47 AM BY: YAZDIAN, FARHAD

LEGEND:

- | | | | |
|--|----------------------------------------------|--|-------------------------|
| | REMOVAL ASPHALT PAVEMENT-FULL DEPTH | | GUIDE RAIL REMOVAL |
| | REMOVAL ASPHALT PAVEMENT-PARTIAL DEPTH 50mm | | BARRIER REMOVAL |
| | REMOVAL ASPHALT PAVEMENT ON STRUCTURES | | CURB AND GUTTER REMOVAL |
| | REMOVE ASPHALT PAVEMENT ON CONCRETE SURFACES | | SEWER PIPE ABANDON |
| | | | SEWER PIPE REMOVAL |

METRIC

PLATE No
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WP No 4074-11-01



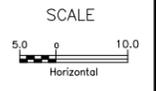
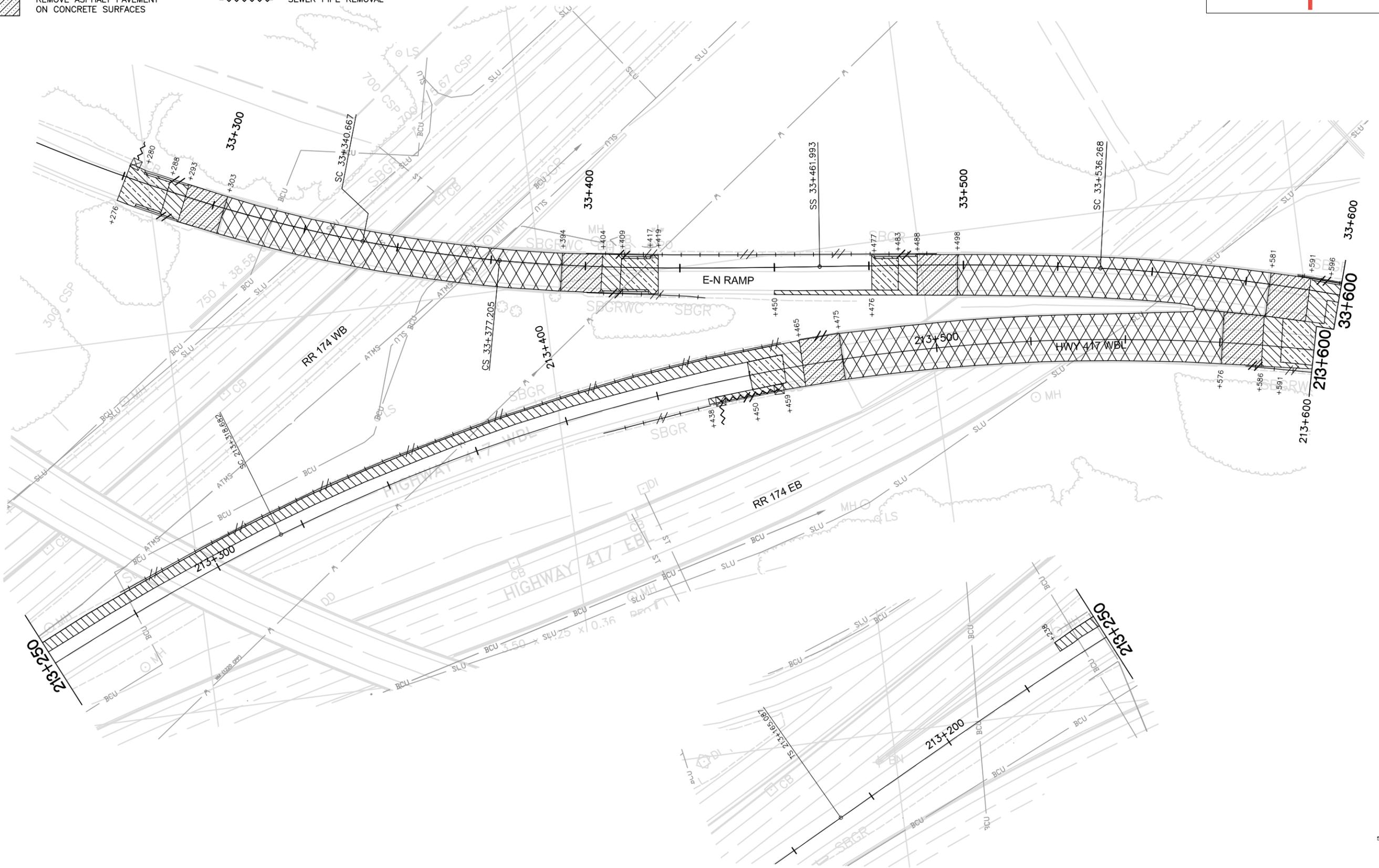
AVIATION BRIDGE NB
REMOVALS
STA 33+275 TO STA 33+600

SHEET
149



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MODIFIED: 21/05/20 09:27:45

Revised



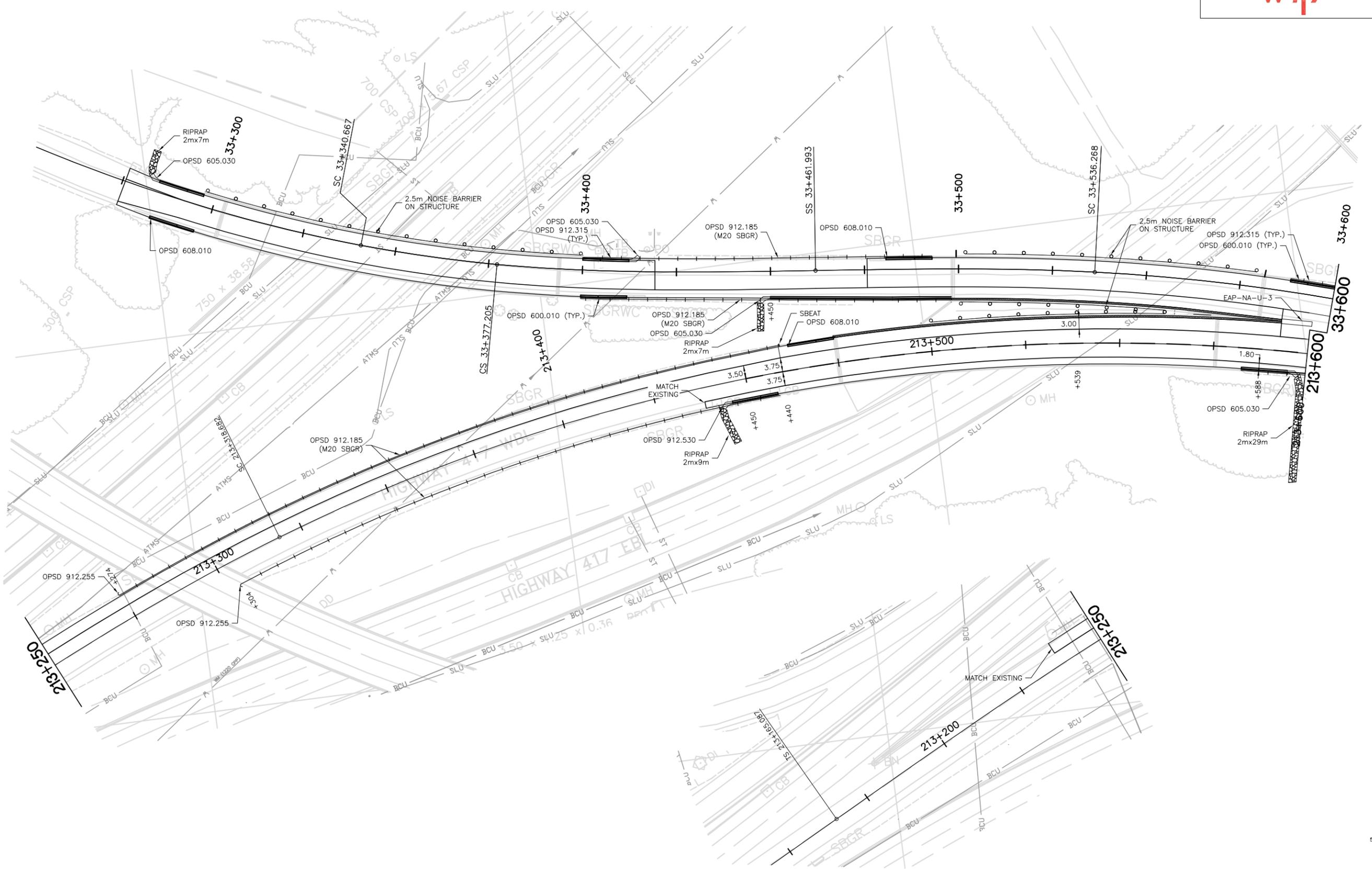
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WP No 4074-11-01



AVIATION BRIDGE NB
NEW CONSTRUCTION
STA 33+275 TO STA 33+600
Survey TO Revised

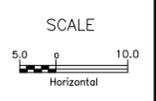
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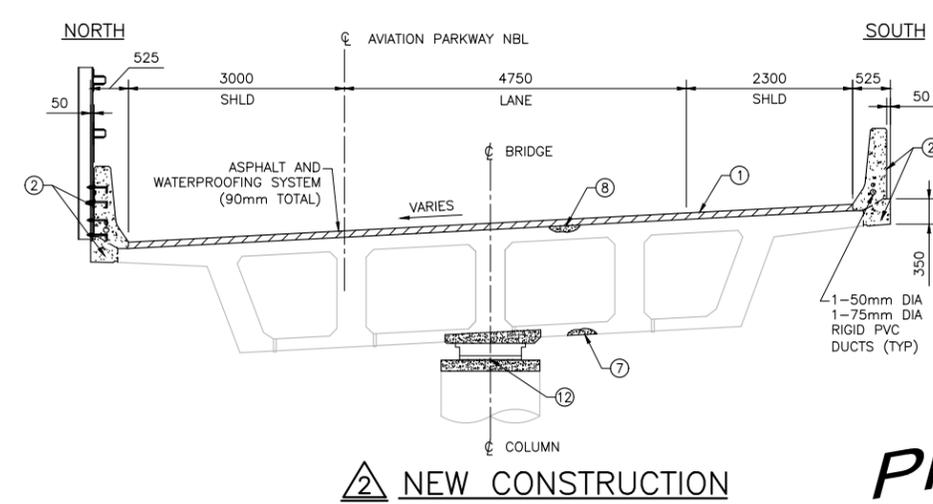
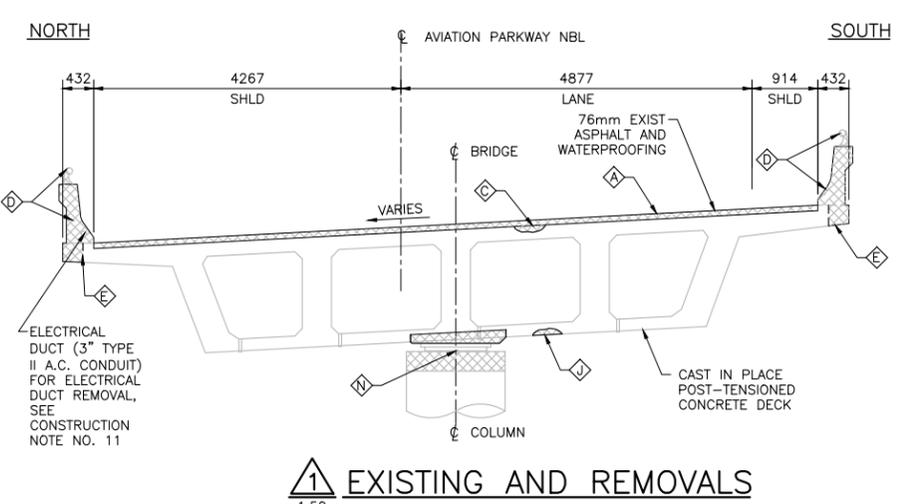
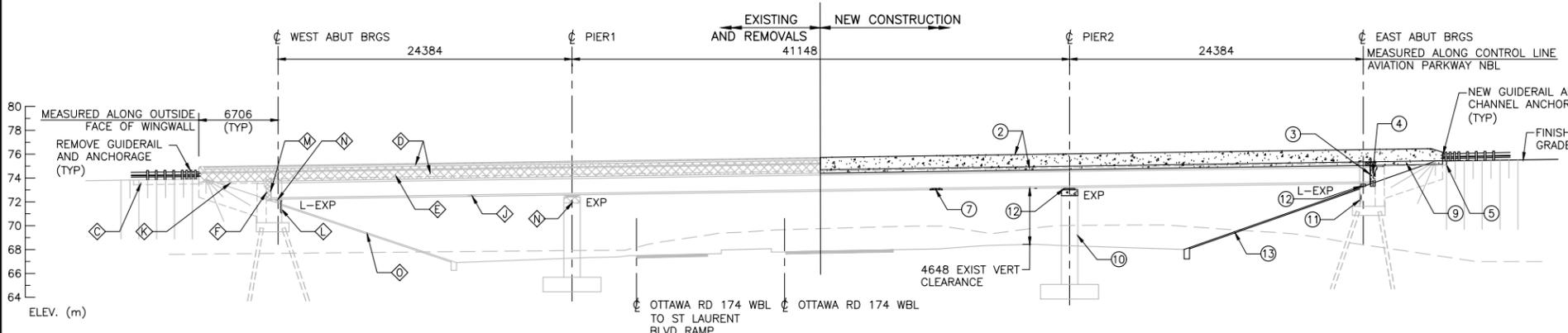
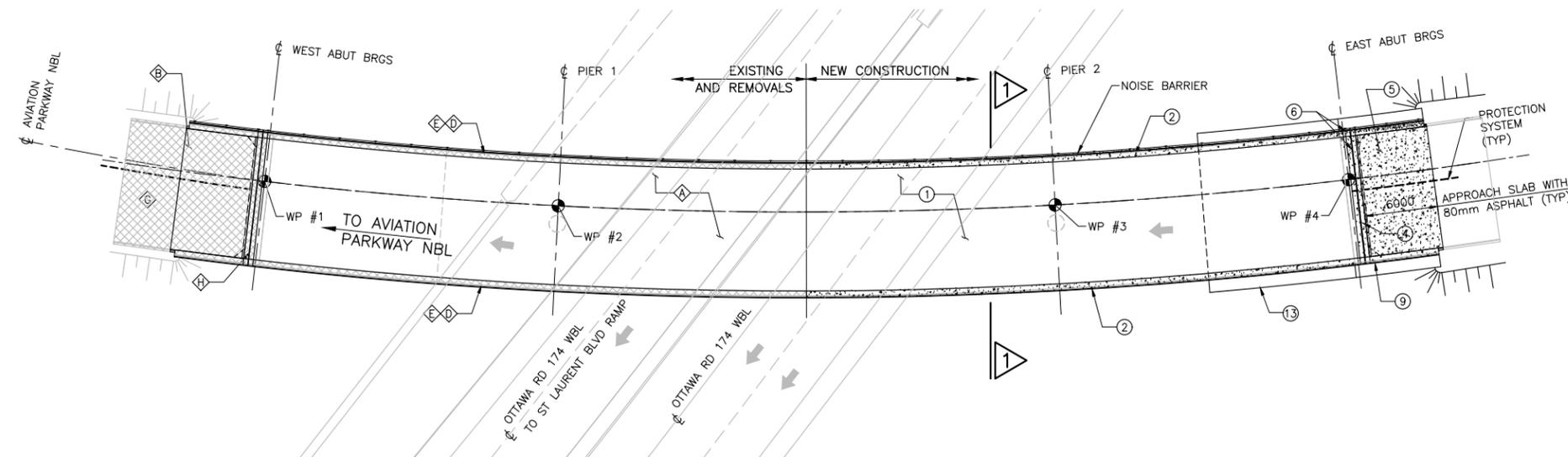
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DRAWN BY: J.F.

MODIFIED: 21/05/20 09:27:45
Revised

MINISTRY OF TRANSPORTATION, ONTARIO
PA-0-307 88-05



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SCOPE OF WORK:

- THE FOLLOWING WORK SHALL BE CARRIED OUT IN STAGES AND IS NOT INTENDED TO BE AN EXHAUSTIVE LIST OF ALL ITEMS REQUIRED TO COMPLETE THE REHABILITATION WORK, NOR IS IT INTENDED TO PROVIDE A SEQUENCE OF CONSTRUCTION ACTIVITIES.
- THE CONTRACTOR SHALL INSTALL TRAFFIC CONTROL SIGNAGE AND WORKER PROTECTION SYSTEMS PRIOR TO THE COMMENCEMENT OF THE WORK.

REMOVALS:

- ① - REMOVE EXISTING ASPHALT AND WATERPROOFING FROM DECK
- ② - REMOVE EXISTING ASPHALT FROM APPROACHES
- ③ - REMOVE DETERIORATED CONCRETE FROM DECK TOP
- ④ - REMOVE BARRIER WALLS WITH RAILING
- ⑤ - REMOVE PART OF DECK CANTILEVER
- ⑥ - REMOVE BALLAST WALLS
- ⑦ - REMOVE APPROACH SLABS
- ⑧ - REMOVE EXPANSION JOINT ASSEMBLIES
- ⑨ - REMOVE DETERIORATED CONCRETE FROM SOFFIT
- ⑩ - REMOVE TOP PART OF WINGWALLS
- ⑪ - REMOVE DETERIORATED CONCRETE FROM SUBSTRUCTURE
- ⑫ - REMOVE DETERIORATED CONCRETE FROM BRIDGE ENDS
- ⑬ - REMOVE BEARINGS AT THE ABUTMENT AND PIERS AND REMOVE PART OF THE TOP OF BEARING SEATS
- ⑭ - REMOVE CONCRETE SLOPE PAVING

NEW CONSTRUCTION:

- ① - PLACE WATERPROOFING ON THE DECK AND PAVE THE DECK AND APPROACHES
- ② - CONSTRUCT PART OF NEW BARRIER WALLS WITH SNOW FENCE AND DECK CANTILEVER
- ③ - REPAIR DECK ENDS
- ④ - RECONSTRUCT NEW BALLAST WALLS
- ⑤ - CONSTRUCT NEW APPROACH SLABS
- ⑥ - INSTALL NEW EXPANSION JOINT ASSEMBLIES WITH EXTERIOR JOINTS DRAINAGE SYSTEM
- ⑦ - REPAIR DECK SOFFIT
- ⑧ - REPAIR DECK TOP
- ⑨ - RECONSTRUCT TOP OF WINGWALL
- ⑩ - PATCH REPAIR PIER
- ⑪ - REMOVE DETERIORATED CONCRETE FROM ABUTMENTS' FACES, EMBED GALVANIC CP AND REFACE ABUTMENTS
- ⑫ - RECONSTRUCT TOP OF BEARING SEATS AT ABUTMENTS AND PIERS AND PLACE ABUTMENT AND PIER BEARINGS
- ⑬ - CONSTRUCT NEW SLOPE PAVING

LIST OF DRAWINGS:

- GENERAL ARRANGEMENT
- CONSTRUCTION STAGING
- JACKING AND BEARINGS DETAILS I
- JACKING AND BEARINGS DETAILS II
- REMOVALS
- NEW CONSTRUCTION I
- NEW CONSTRUCTION II
- BARRIER WALL W/O RAILING, TL-5
- NOISE BARRIER DETAILS
- APPROACH SLABS
- STRIP SEAL EXPANSION JOINT ASSEMBLY FOR BARRIER WALLS - WITH DRAINAGE SYSTEM
- STRIP SEAL EXPANSION JOINT TYPE 'A' - DETAILS
- EXPANSION JOINT DRAINAGE SYSTEM CATCH BASIS AND DOWNPIPE - DETAILS
- STANDARD DETAILS
- ELECTRICAL EMBEDDED WORK

LIST OF ABBREVIATIONS:

- FIX FIXED
- SHLD SHOULDER
- L-EXP LIMITED EXPANSION
- WP WORKING POINT

LEGEND:

- ① REMOVALS
- ② NEW CONCRETE
- ③ NEW ASPHALT

DISTRICT CONT. No. WP No.	OTTAWA RD 174 AVIATION PARKWAY NB O/P REHABILITATION	SHEET 201
GENERAL ARRANGEMENT		METRIC

GENERAL NOTES:

- ALL DIMENSIONS ARE BASED ON THE ORIGINAL DRAWINGS OF THE EXISTING BRIDGE BY DELEUW, CATHER ENGINEERS & PLANNERS - OTTAWA, WESTBOUND OVERPASS OF O.Q.W. TO EASTERN PARKWAY BRIDGE NO 8, SITE 3-304B, WP NO 13-68-03, DATED APR. 1973.
- CLASS OF CONCRETE 30MPa.
- CLEAR COVER TO REINFORCING STEEL
DECK: TOP 70±20
BOTTOM 50±10
REMAINDER UNLESS OTHERWISE NOTED 70±20
CLEAR COVER TO REINFORCING STAINLESS STEEL 60±10
- REINFORCING STEEL REINFORCING STEEL SHALL BE GRADE 400W UNLESS OTHERWISE SPECIFIED.
UNLESS SHOWN OTHERWISE, TENSION LAP SPLICES SHALL BE CLASS B.
BAR MARKS WITH PREFIX 'S' DENOTE STAINLESS STEEL BARS.
STAINLESS REINFORCING STEEL SHALL BE TYPE 316LN OR DUPLEX 2205 AND HAVE A MINIMUM YIELD STRENGTH OF 500 MPA, UNLESS OTHERWISE SPECIFIED.
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.

CONSTRUCTION NOTES:

- DETAILS, DIMENSIONS AND ELEVATIONS SHOWN FOR THE EXISTING STRUCTURE ARE THEORETICAL AND HAVE BEEN ESTABLISHED FROM THE ORIGINAL STRUCTURE DRAWINGS. THE CONTRACTOR SHALL CONFIRM THESE DETAILS, DIMENSIONS AND ELEVATIONS THROUGH DETAILED SURVEY AND FIELD MEASUREMENT OF THE EXISTING STRUCTURE AND SHALL REPORT ANY DISCREPANCIES TO THE CONTRACT ADMINISTRATOR BEFORE PROCEEDING WITH THE WORK.
- NO BACKFILL SHALL BE PLACED BEHIND THE ABUTMENTS AND WINGWALLS UNTIL THE CONCRETE IN THESE COMPONENTS HAS REACHED 75% OF ITS DESIGN STRENGTH.
- TEMPORARY SUPPORT AT PIERS ARE REQUIRED DURING BEARING REPLACEMENT AND INSTALLATION.
- SAWCUTS IN CONCRETE, WHERE DESIGNATED, SHALL BE 25 mm DEEP OR TO THE FIRST LAYER OF REINFORCING STEEL, WHICHEVER IS LESS.
- THE CONTRACTOR IS RESPONSIBLE FOR THE DESIGN AND INSTALLATION OF ALL DEBRIS CONTAINMENT SYSTEMS.
- ALL MATERIAL SHALL BE IN ACCORDANCE WITH MTO DESIGNATED SOURCES FOR MATERIALS (DSM).
- THE CONTRACTOR SHALL LOCATE AND PROTECT ALL UTILITIES DURING CONSTRUCTION OPERATIONS.
- STABILITY AND INTEGRITY OF THE STRUCTURE SHALL BE MAINTAINED AT ALL STAGES OF CONSTRUCTION.
- ALL EXPOSED EDGES TO RECEIVE A 20x20 CHAMFER.
- ALL AREAS AFFECTED BY CONSTRUCTION ACTIVITIES SHALL BE FULLY REINSTATED TO PRE-CONSTRUCTION OR BETTER CONDITIONS TO THE SATISFACTION OF THE CONTRACT ADMINISTRATOR.
- HAZARDOUS MATERIALS ARE PRESENT IN THE FOLLOWING:
- ELECTRICAL DUCTS CONTAIN ASBESTOS

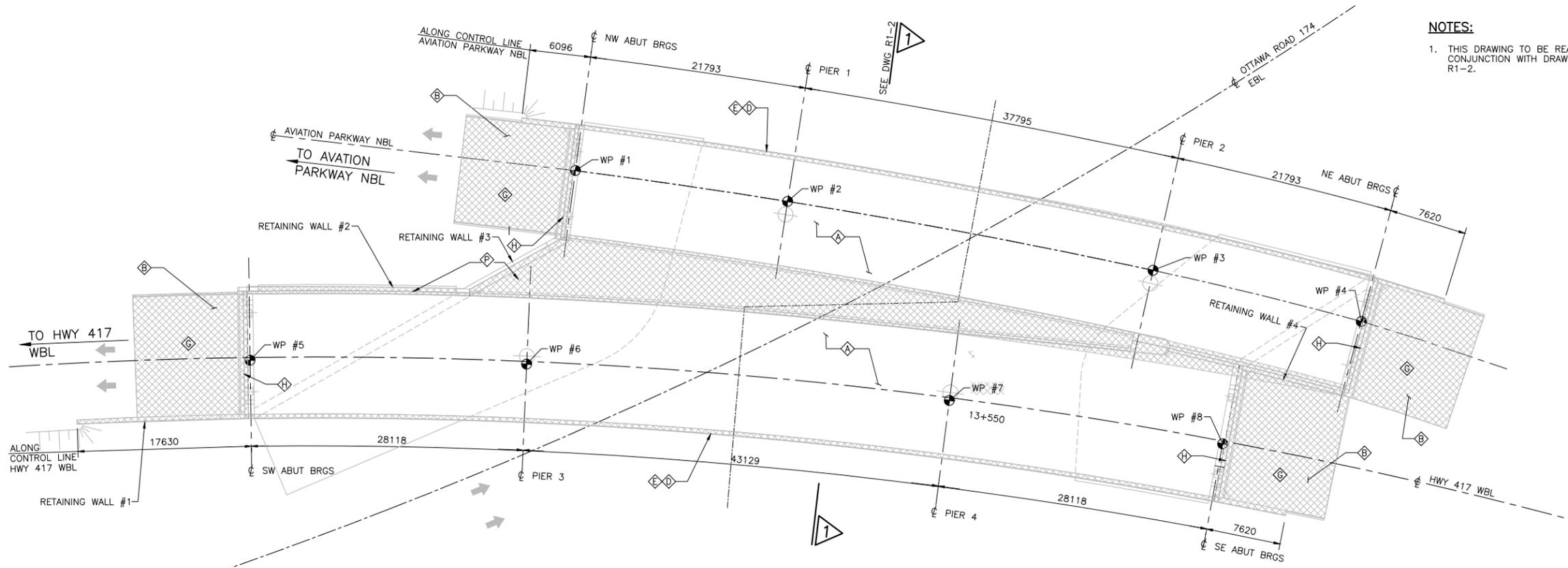
APPLICABLE STANDARD DRAWINGS:

- OPSD 3101.150 WALLS-ABUTMENT, BACKFILL MINIMUM GRANULAR REQUIREMENT
- OPSD 3349.101 DECK, DRAINS DRAINAGE OF EXISTING DECK BELOW ASPHALT WEARING SURFACE
- OPSD 3370.100 DECK, WATERPROOFING HOT APPLIED ASPHALT MEMBRANE WITH PROTECTION BOARD
- OPSD 3370.101 DECK, WATERPROOFING HOT APPLIED ASPHALT MEMBRANE AT ACTIVE CRACKS GREATER THAN 2 mm WIDE AND CONSTRUCTION JOINTS
- OPSD 3419.100 BARRIERS AND RAILINGS-STEEL GUIDE RAIL AND CHANNEL ANCHORAGE

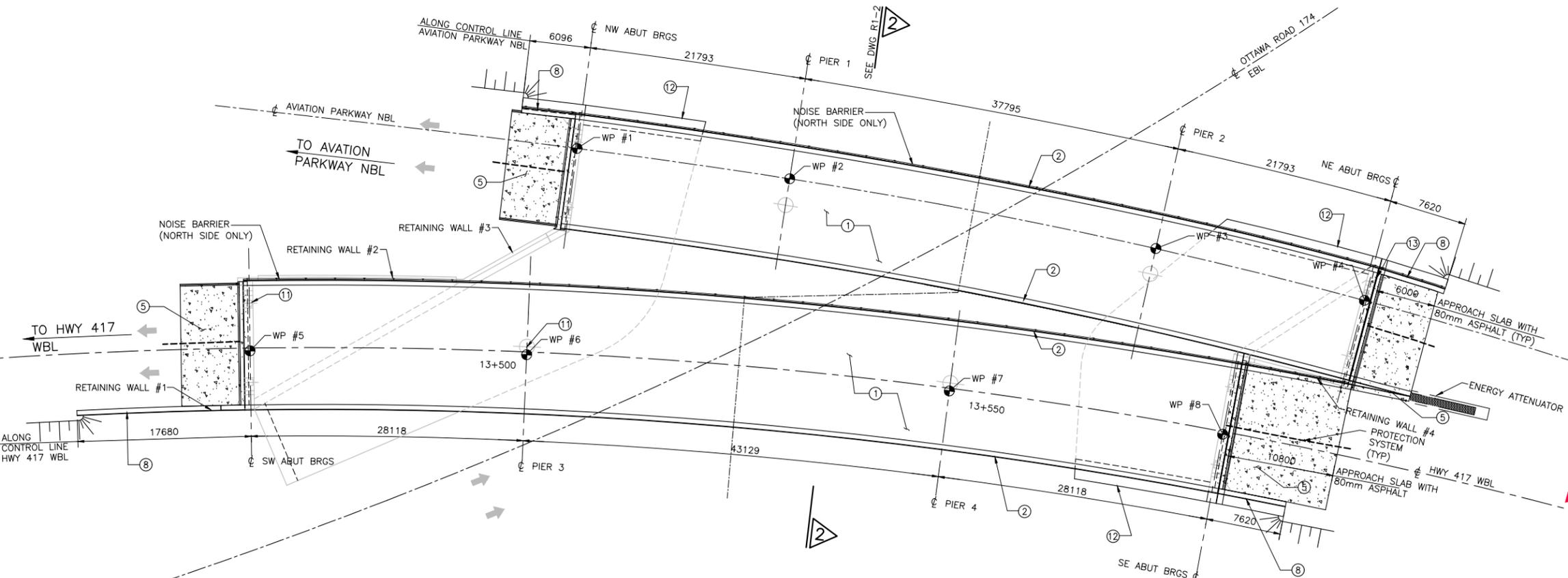
PRELIMINARY
27 AUG 2021
NOT FOR CONSTRUCTION

DRAWING NOT TO BE SCALED
100mm ON ORIGINAL DRAWING

REVISIONS	DATE	BY	DESCRIPTION
DESIGN	SZ	CHK MZ	CODE CHBDC-14 LOAD CL-625-ONT
DRAWN	ET	CHK SZ	SITE 03X-0304/B2
			DATE AUG/21
			DWG 1



PLAN - EXISTING AND REMOVALS
1:250



PLAN - NEW CONSTRUCTION
1:250

NOTES:

- THIS DRAWING TO BE READ IN CONJUNCTION WITH DRAWING R1-2.

DISTRICT CONT. No. WP No.	
HWY 417 WBL AVIATION PARKWAY O/P 'Y' REHABILITATION	
GENERAL ARRANGEMENT I	METRIC
	

GENERAL NOTES:

- ALL DIMENSIONS ARE BASED ON THE ORIGINAL DRAWINGS OF THE EXISTING BRIDGE BY DELEUW, CATHIER ENGINEERS & PLANNERS - OTTAWA, WESTBOUND OVERPASS TO EASTERN PARKWAY AND TO O.Q.W. WBL BRIDGE NO 7, SITE 3-304A-1, WP NO 13-68-02, DATED JUNE 1973.
- CLASS OF CONCRETE
DECK 35MPa.
REMAINDER 30MPa.
- CLEAR COVER TO REINFORCING STEEL
DECK: TOP 70±20
BOTTOM 50±10
REMAINDER UNLESS OTHERWISE NOTED 70±20
CLEAR COVER TO REINFORCING STAINLESS STEEL 60±10
- REINFORCING STEEL
REINFORCING STEEL SHALL BE GRADE 400W UNLESS OTHERWISE SPECIFIED.
UNLESS SHOWN OTHERWISE, TENSION LAP SPLICES SHALL BE CLASS B.
BAR MARKS WITH PREFIX 'S' DENOTE STAINLESS STEEL BARS.
STAINLESS REINFORCING STEEL SHALL BE TYPE 316LN OR DUPLEX 2205 AND HAVE A MINIMUM YIELD STRENGTH OF 500 MPA, UNLESS OTHERWISE SPECIFIED.
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.
- PROTECTION SYSTEM SHALL CONFORM TO PERFORMANCE LEVEL 2.

LIST OF DRAWINGS:

- GENERAL ARRANGEMENT I
- GENERAL ARRANGEMENT II
- CONSTRUCTION STAGING
- JACKING DETAILS AND BEARINGS I
- JACKING DETAILS AND BEARINGS II
- REMOVALS I
- REMOVALS II
- NEW CONSTRUCTION I
- NEW CONSTRUCTION II
- NEW CONSTRUCTION III
- INSIDE BARRIER WALL W/O RAILING, TL-5 (STAINLESS STEEL REBAR) - NORTH BRIDGE
- INSIDE BARRIER WALL W/O RAILING, TL-5 (STAINLESS STEEL REBAR) - SOUTH BRIDGE
- OUTSIDE BARRIER WALL W/O RAILING, TL-5 (STAINLESS STEEL REBAR)
- NOISE BARRIER DETAILS
- APPROACH SLABS
- STRIP SEAL EXPANSION JOINT ASSEMBLY FOR BARRIER WALLS-WITH DRAINAGE SYSTEM
- STRIP SEAL EXPANSION JOINT-TYPE 'A' DETAILS
- EXPANSION JOINT DRAINAGE SYSTEM CATCH BASIS AND DOWNPIPE-DETAILS
- DETAILS OF CONCRETE SLOPE PAVING
- STANDARD DETAILS
- ELECTRICAL EMBEDDED WORK

PRELIMINARY
27 AUG 2021
NOT FOR CONSTRUCTION

DRAWING NOT TO BE SCALED
100mm ON ORIGINAL DRAWING

REVISIONS	DATE	BY	DESCRIPTION

DESIGN SZ	CHK MZ	CODE CHBDC-14	LOAD CL-625-ONT	DATE AUG/21
DRAWN SM/ET/CHK	SZ	SITE 03X-0304/B1		DWG 1

DISTRICT CONT. No.	
WP No.	
HWY 417 WBL AVIATION PARKWAY O/P 'Y' REHABILITATION	SHEET 218
GENERAL ARRANGEMENT II	
wsp	METRIC

NOTES:

1. THIS DRAWING TO BE READ IN CONJUNCTION WITH DRAWING 1.

CONSTRUCTION NOTES:

- THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS OF THE WORK AND ALL DETAILS ON SITE AND REPORT ANY DISCREPANCIES TO THE CONTRACT ADMINISTRATOR BEFORE PROCEEDING WITH THE REPAIR WORK. THE CONTRACTOR SHALL ADJUST DIMENSIONS OF THE WORK AS REQUIRED TO SUIT EXISTING CONDITIONS.
- SAWCUTS IN CONCRETE, WHERE DESIGNATED, SHALL BE 25 mm DEEP OR TO THE FIRST LAYER OF REINFORCING STEEL, WHICHEVER IS LESS.
- THE CONTRACTOR IS RESPONSIBLE FOR THE DESIGN AND INSTALLATION OF ALL DEBRIS CONTAINMENT SYSTEMS.
- ALL MATERIAL SHALL BE IN ACCORDANCE WITH MTO DESIGNATED SOURCES FOR MATERIALS (DSM).
- THE CONTRACTOR SHALL LOCATE AND PROTECT ALL UTILITIES DURING CONSTRUCTION OPERATIONS.
- STABILITY AND INTEGRITY OF THE STRUCTURE SHALL BE MAINTAINED AT ALL STAGES OF CONSTRUCTION.
- ALL EXPOSED EDGES TO RECEIVE A 20x20 CHAMFER.
- ALL AREAS AFFECTED BY CONSTRUCTION ACTIVITIES SHALL BE FULLY REINSTATED TO PRE-CONSTRUCTION OR BETTER CONDITIONS TO THE SATISFACTION OF THE CONTRACT ADMINISTRATOR.
- HAZARDOUS MATERIALS ARE PRESENT IN THE FOLLOWING:
 - ELECTRICAL DUCTS CONTAIN ASBESTOS

SCOPE OF WORK:

- THE FOLLOWING WORK SHALL BE CARRIED OUT IN STAGES AND IS NOT INTENDED TO BE AN EXHAUSTIVE LIST OF ALL ITEMS REQUIRED TO COMPLETE THE REHABILITATION WORK, NOR IS IT INTENDED TO PROVIDE A SEQUENCE OF CONSTRUCTION ACTIVITIES.
- THE CONTRACTOR SHALL INSTALL TRAFFIC CONTROL SIGNAGE AND WORKER PROTECTION SYSTEMS PRIOR TO THE COMMENCEMENT OF THE WORK.

REMOVALS:

- ④ - REMOVE EXISTING ASPHALT AND WATERPROOFING FROM DECK
- ⑤ - REMOVE EXISTING ASPHALT FROM APPROACHES
- ⑥ - REMOVE DETERIORATED CONCRETE FROM DECK TOP
- ⑦ - REMOVE BARRIER WALLS WITH RAILING
- ⑧ - REMOVE DECK FASCIA
- ⑨ - REMOVE BALLAST WALLS, PART OF WINGWALLS AND PART OF CLEATS
- ⑩ - REMOVE APPROACH SLABS
- ⑪ - REMOVE EXPANSION JOINT ASSEMBLIES
- ⑫ - REMOVE DETERIORATED CONCRETE FROM SOFFIT
- ⑬ - REMOVE TOP PART OF WINGWALLS
- ⑭ - REMOVE DETERIORATED CONCRETE FROM SUBSTRUCTURE
- ⑮ - REMOVE DETERIORATED CONCRETE FROM BRIDGE ENDS
- ⑯ - REMOVE BEARINGS AT THE ABUTMENTS AND PIERS
- ⑰ - REMOVE PART OF CONCRETE SLOPE PAVING
- ⑱ - REMOVE FLOATING MEDIAN SLAB, CURBS AND MEDIAN SLAB SEATS ON BOTH BRIDGES

NEW CONSTRUCTION:

- ① - PLACE WATERPROOFING ON THE DECK AND PAVE THE DECK AND APPROACHES
- ② - CONSTRUCT NEW DECK FASCIA AND BARRIER WALLS WITH SNOW FENCE.
- ③ - REPAIR DECK ENDS
- ④ - RECONSTRUCT NEW BALLAST WALLS
- ⑤ - CONSTRUCT NEW APPROACH SLABS
- ⑥ - REPAIR DECK SOFFIT
- ⑦ - REPAIR DECK TOP
- ⑧ - RECONSTRUCT TOP OF WINGWALL
- ⑨ - PATCH REPAIR SUBSTRUCTURE
- ⑩ - REMOVE DETERIORATED CONCRETE FROM ABUTMENTS' FACES, EMBED GALVANIC CP AND REFACE ABUTMENTS
- ⑪ - REPLACE ABUTMENTS AND PIERS BEARINGS
- ⑫ - REPAIR AND CONSTRUCT NEW PART OF CONCRETE SLOPE PAVING
- ⑬ - INSTALL NEW EXPANSION JOINT ASSEMBLIES WITH EXTERIOR JOINTS DRAINAGE SYSTEM

APPLICABLE STANDARD DRAWINGS:

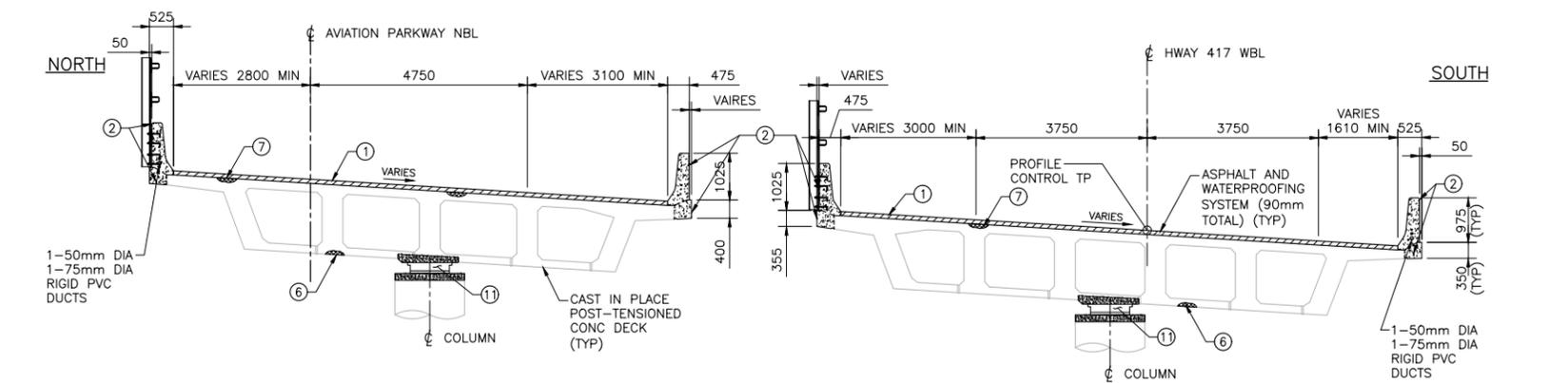
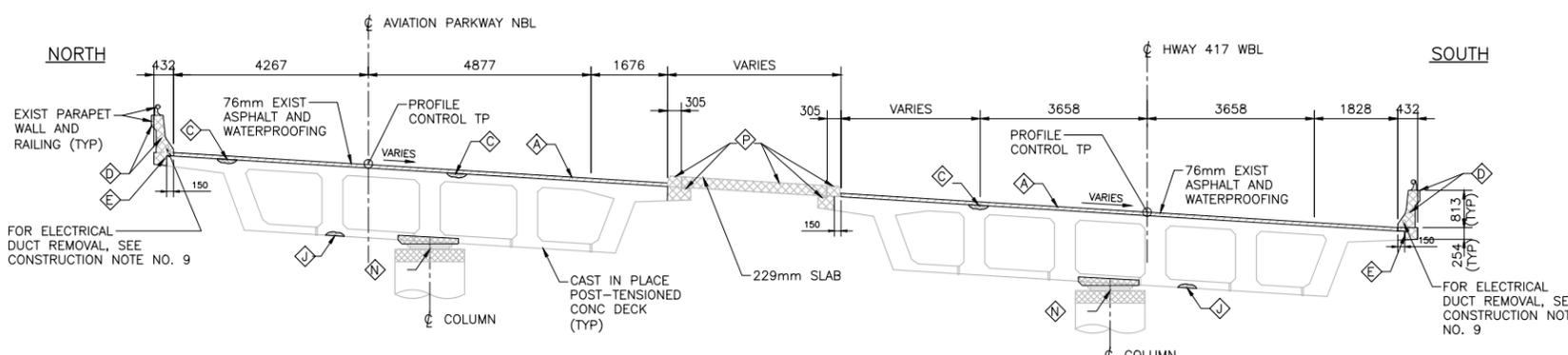
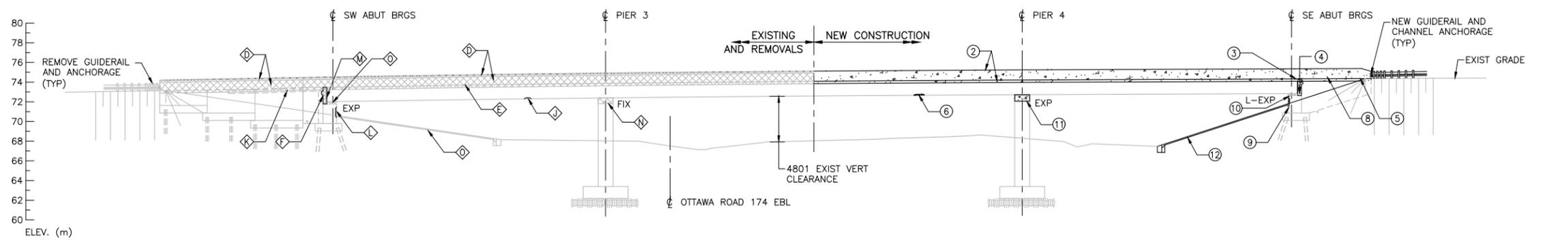
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- OPSD 3349.101 DECK, DRAINS DRAINAGE OF EXISTING DECK BELOW ASPHALT WEARING SURFACE
- OPSD 3370.100 DECK, WATERPROOFING HOT APPLIED ASPHALT MEMBRANE WITH PROTECTION BOARD
- OPSD 3370.101 DECK, WATERPROOFING HOT APPLIED ASPHALT MEMBRANE AT ACTIVE CRACKS GREATER THAN 2 mm WIDE AND CONSTRUCTION JOINTS
- OPSD 3419.100 BARRIERS AND RAILINGS-STEEL GUIDE RAIL AND CHANNEL ANCHORAGE

LIST OF ABBREVIATIONS:

- FIX FIXED
- EXP EXPANSION
- L-EXP LIMITED EXPANSION
- NE NORTH-EAST
- NW NORTH-WEST
- SE SOUTH-EAST
- SHLD SHOULDER
- SW SOUTH-WEST
- WP WORKING POINT

- LEGEND:**
- REMOVALS
 - NEW CONCRETE
 - NEW ASPHALT

PRELIMINARY
27 AUG 2021
NOT FOR CONSTRUCTION



DRAWING NOT TO BE SCALED
100mm ON ORIGINAL DRAWING

REVISIONS		DATE	BY	DESCRIPTION
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				DATE AUG/21
				DWG 2

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 DATE PLOTTED: 8/27/2021 11:59:47 AM BY: TSENER, ELENA

PR-D-707 88-05
 MINISTRY OF TRANSPORTATION, ONTARIO

METRIC

PLATE No
CONT No
WP No 4074-11-01



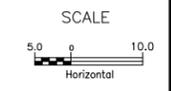
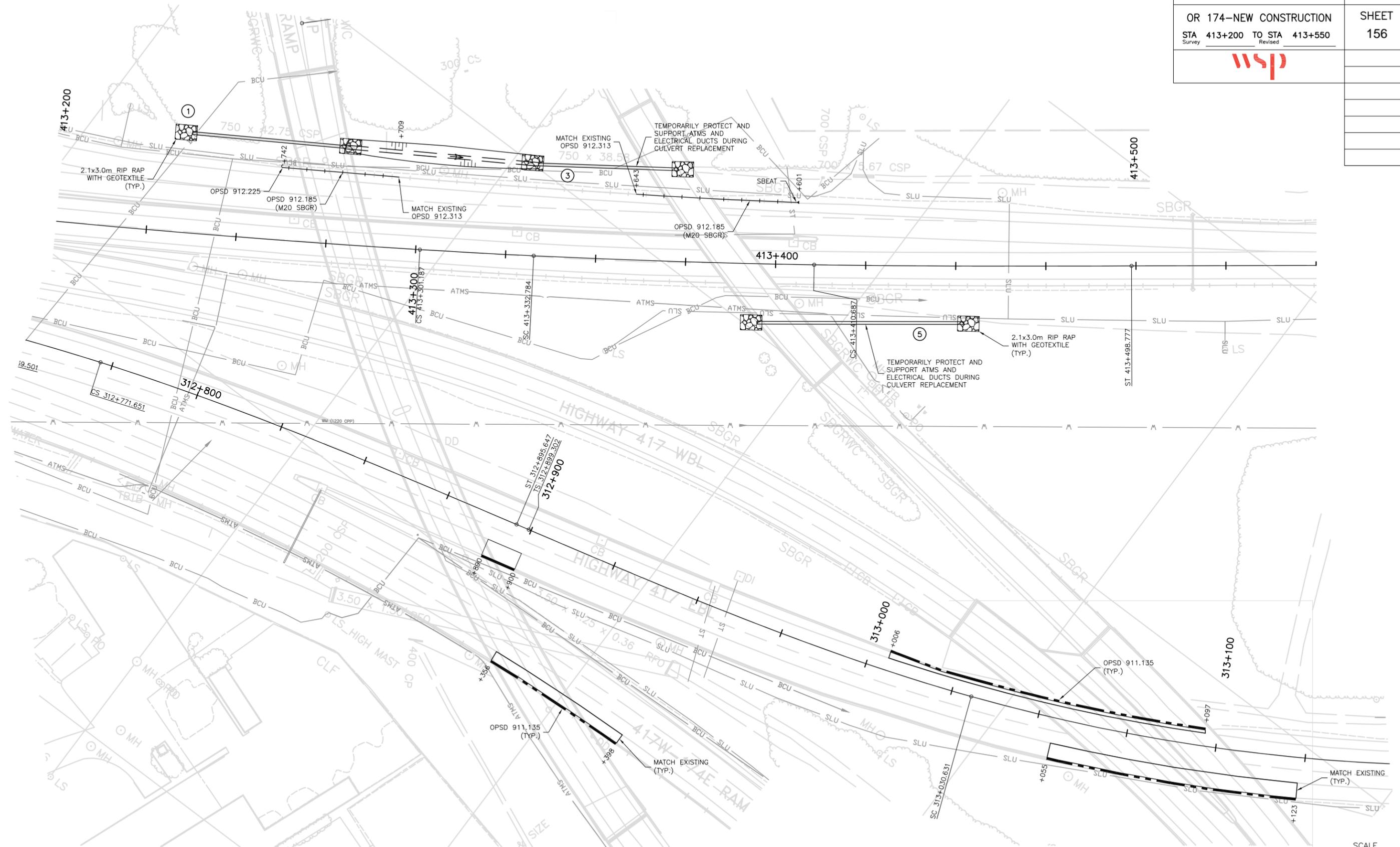
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STA 413+200 TO STA 413+550
Survey Revised

SHEET
156



MINISTRY OF TRANSPORTATION, ONTARIO
PK-0-707 BR-05

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Revised



METRIC

PLATE No
CONT No X
WP No 4074-11-01



AVIATION BRIDGE NB
NEW CONSTRUCTION
TO STA
Survey Revised

SHEET
152

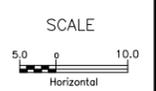
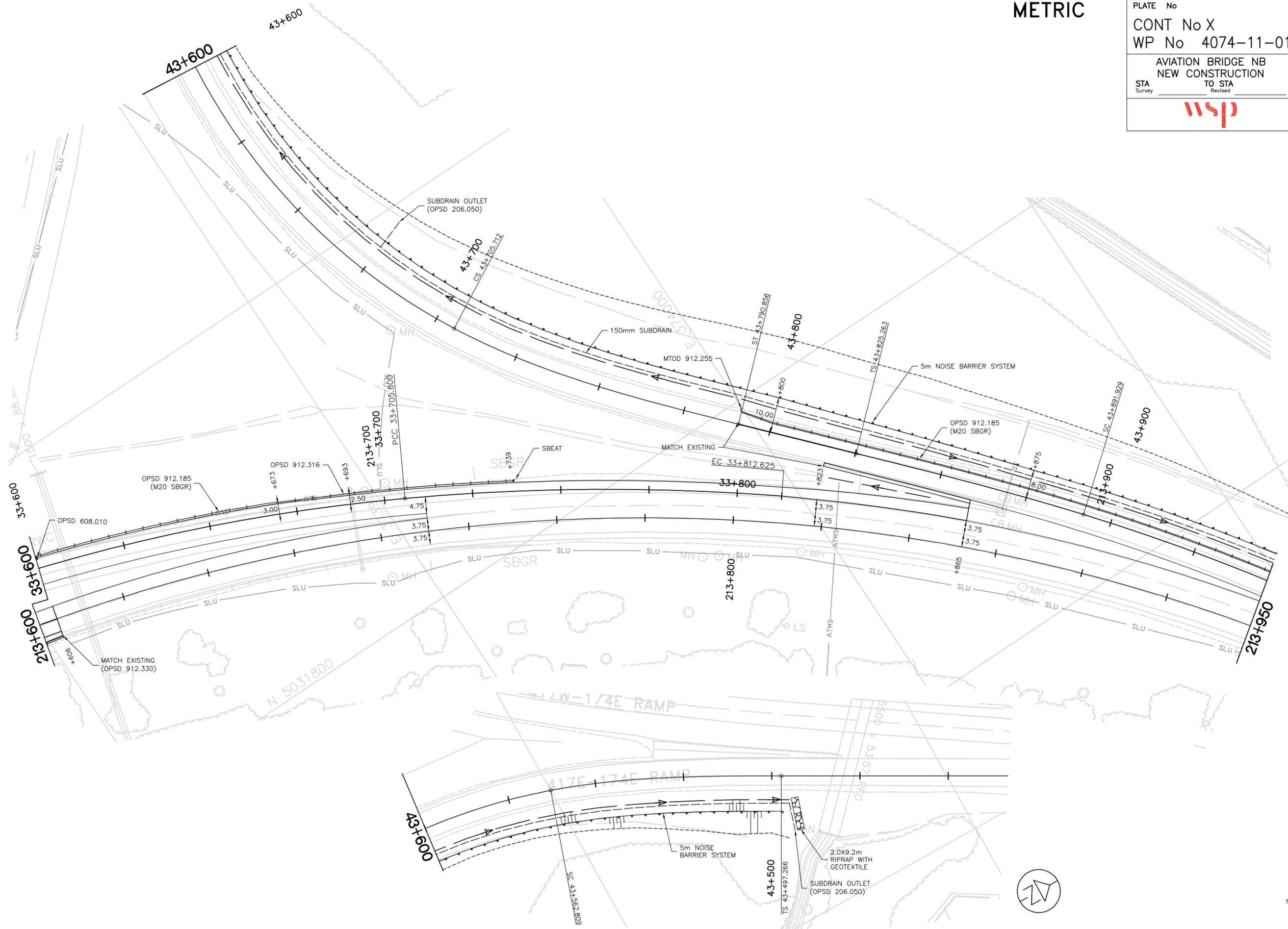


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Revised

MINISTRY OF TRANSPORTATION, ONTARIO

PK-0-707 88-05



METRIC

PLATE No
CONT No X
WP No 4074-11-01



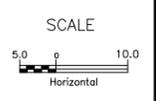
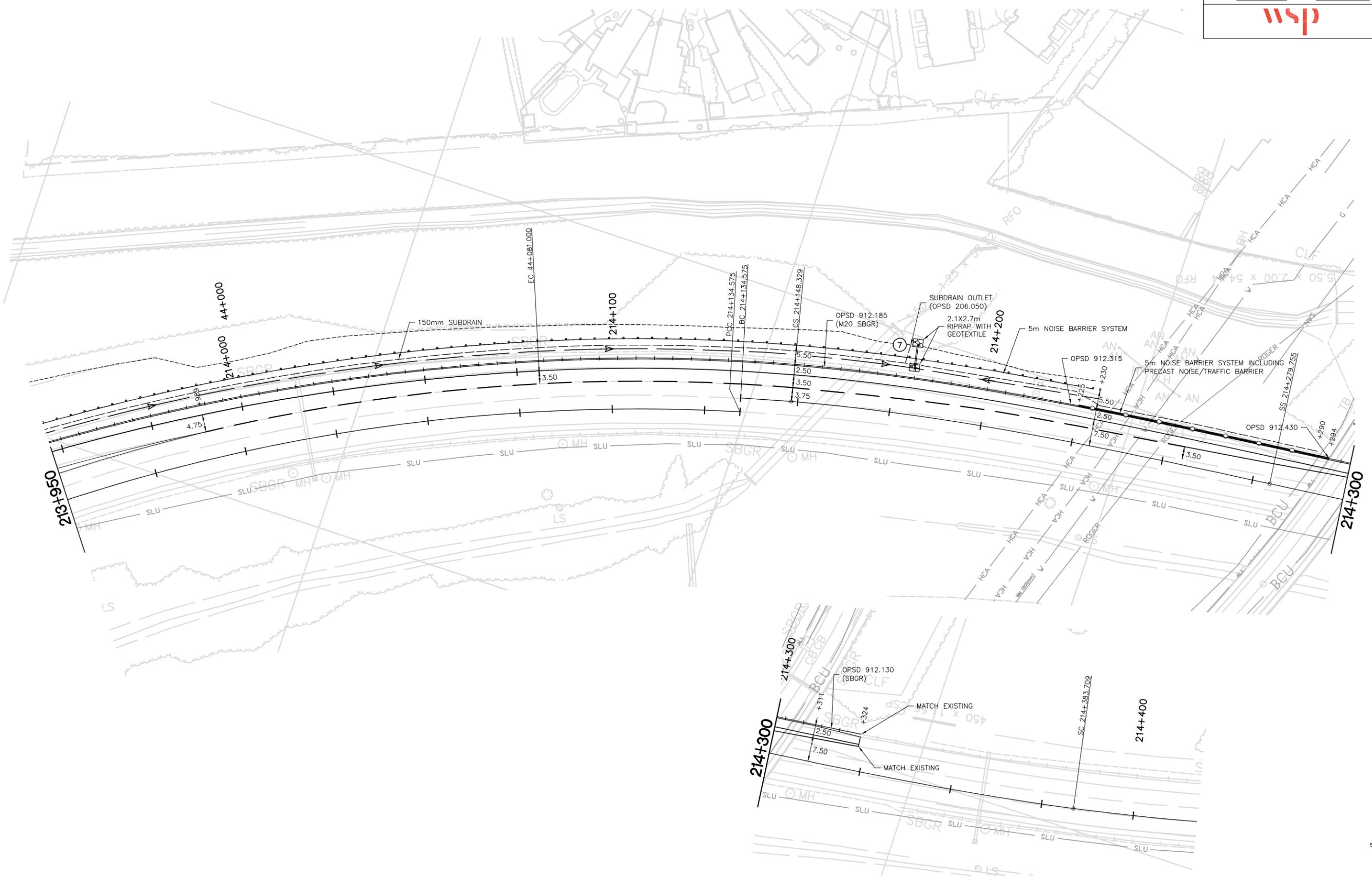
AVIATION BRIDGE NB
NEW CONSTRUCTION
STA 213+950 TO STA
Survey Revised

SHEET
154



MINISTRY OF TRANSPORTATION, ONTARIO
PK-0-707 88-05

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Revised



METRIC

PLATE No
CONT No
WP No 4074-11-01



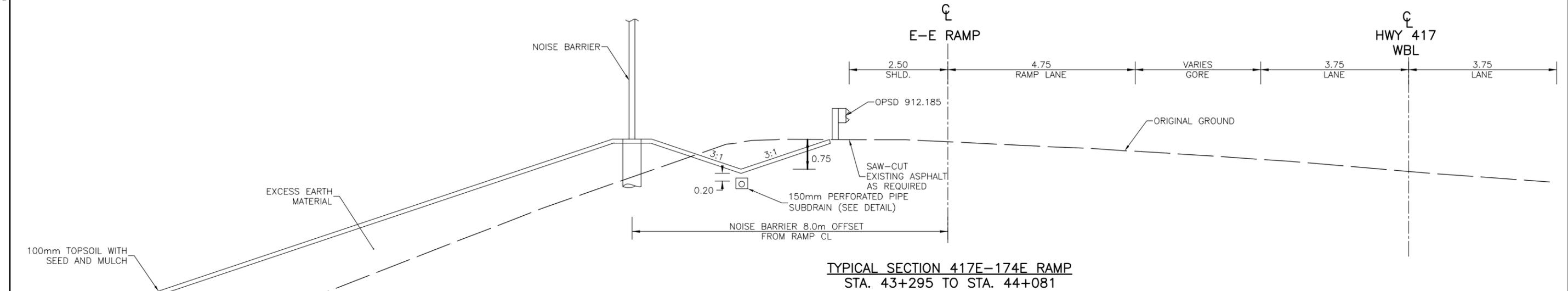
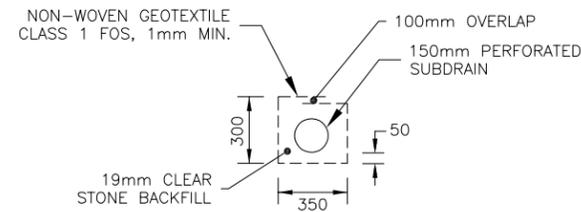
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SHEET
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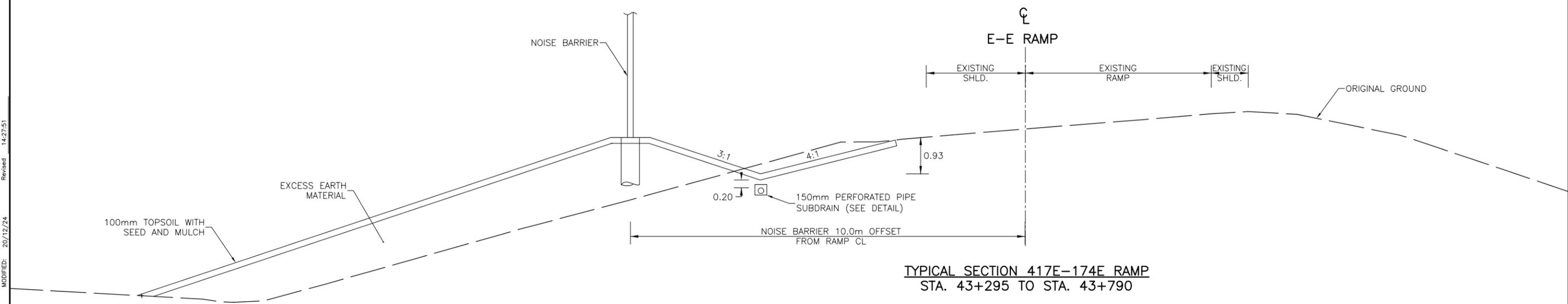


NOTES:

1. TYPICAL SECTIONS TO BE READ IN CONJUNCTION WITH NEW CONSTRUCTION AND REMOVALS.
2. ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SPECIFIED.
3. NOISE BARRIER TYPE AND MATERIAL DETAILED ELSEWHERE.



TYPICAL SECTION 417E-174E RAMP
STA. 43+295 TO STA. 44+081



TYPICAL SECTION 417E-174E RAMP
STA. 43+295 TO STA. 43+790

N.T.S.

FILE LOCATION: O:\17M-00850-00-HWY 417 EAST WIDENING\CURRENT\CONTRACT 2\SHEETS\
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MODIFIED: 20/12/24
Revised 14:27:51

MINISTRY OF TRANSPORTATION, ONTARIO
PP-0-707
88-05

APPENDIX

E

MTO BEST

MANAGEMENT

PRACTICES

4 BRIDGE MAINTENANCE

4.1 SCOPE

This MTO Best Management Practice (BMP) applies to bridge maintenance activities requiring in-water works or works over a waterbody supporting fish and fish habitat.

This bridge maintenance BMP may be used for the following:

- Removal of debris to protect piers and abutments.
- Structural repairs and reinforcement, [including bridge deck replacement](#).
- Any bridge maintenance works over a waterbody and outside of the high water level.

This bridge maintenance BMP may not be used for the following:

- In-water work/activities outside of the appropriate in-water work timing windows.
- In-water work where federally listed aquatic species at risk are present.
- Replacement reinforcement/armouring with aggregates placed below the high water level, if federally listed aquatic species at risk or significant fish habitat are present.
- Realigning the waterbody or replacing the existing bridge.
- New dredging or excavating the waterbody bed.
- New fill placed below the high water level.
- Use of explosives to remove debris, including ice build-up.

Activities undertaken in relation to the project shall be in compliance with the federal Species at Risk Act and the provincial Endangered Species Act. It is up to the user of this BMP to obtain all necessary permits required to proceed with the work.

4.2 ADDITIONAL REFERENCES

- [MTO BMP for Maintenance of Riparian Vegetation in Existing Right-of-Way](#)

4.3 MAINTENANCE/CONSTRUCTION PROCEDURES

4.3.1 POTENTIAL IMPACTS TO FISH AND FISH HABITAT

- Introduction of sediments, concrete and other deleterious substances (e.g., salt, paint, solvents, oil and grease) into waterbodies.
- Removal of woody debris and riparian vegetation may alter natural habitat features and flows that exist in the waterbody.
- Operation of machinery may impact habitat on the waterbody bed and waterbody banks and result in erosion and sedimentation.
- Placement of aggregates in a waterbody to stabilize structures may alter natural habitat and flows, and block fish passage.

4.3.2 OPERATIONAL CONDITIONS

Bridge maintenance activities as outlined in the scope of this BMP that are carried out in accordance with all of the following operational constraints, protection measures and submission requirements are considered to be in compliance with the Fisheries Act and the Fisheries Protocol. As such these works may proceed without further review.

This BMP can only be used if all applicable listed operational constraints and protection measures can be followed. If the BMP cannot be used, proceed to Step 4 of the Fisheries Protocol.

4.3.3 OPERATIONAL CONSTRAINTS AND PROTECTION MEASURES

4.3.3.1 PROVINCIAL STANDARDS

Fish Protection

Fish protection including in-water work timing windows shall be conducted according to OPSS.PROV 182.

Dewatering and Temporary Flow Passage

Dewatering and/or temporary flow passage shall be according to OPSS.PROV 517 and OPSS.PROV 182.

Placement of Aggregates in Waterbodies

The use of aggregate in waterbodies shall be according to OPSS.PROV 825 and OPSS.PROV 1005.

Equipment Use

Use of equipment shall be according to OPSS.PROV 182.

Preservation of Riparian Vegetation

Removal of riparian vegetation shall be according to OPSS.PROV 182.

Erosion and Sediment Control

The installation, monitoring, maintenance, and removal of temporary erosion and sediment control measures shall be according to OPSS.PROV 182 and OPSS.PROV 805.

Restoration of Disturbed Areas

Vegetation protection and rehabilitation shall be according to OPSS.PROV 182 and OPSS.PROV 804.

Management of Excess Materials

All excess material shall be managed according to OPSS.PROV 180.

4.3.3.2 GENERAL

- Bridge maintenance activities shall be scheduled to prevent disruption to sensitive fish life stages by adhering to appropriate in-water work timing windows.
- While this BMP does not cover the clearing of riparian vegetation, the removal of select plants may be required and shall be kept to a minimum and limited to the right-of-way of the bridge. Refer to the MTO BMP Riparian Vegetation Maintenance in Existing Right-of-Way.

4.3.3.3 REMOVAL OF DEBRIS

- The removal of material shall be limited to that which is necessary to protect piers and abutments.
- Debris removal shall be by hand or with machinery operating from waterbody banks or a floating barge.

4.3.3.4 STRUCTURAL REPAIRS AND REINFORCEMENTS

- Barges or shrouding shall be used to trap and prevent concrete and other bridge materials from entering the waterbody.
- If replacement reinforcement/armouring with aggregates in a waterbody is required to stabilize eroding areas around bridge structures (e.g. abutments and/or wing walls) below the high water level, the following measures shall be incorporated:

- Place appropriately sized aggregates into the eroding area;
- Aggregate material that is to be placed in the waterbody shall not be obtained from below the high water level of any waterbody; and,
- Install aggregates in the waterbody at a similar slope to maintain a natural waterbody bed alignment, ensuring that it does not interfere with fish passage or constrict the waterbody width.

4.4 SUBMISSION REQUIREMENTS

A MTO Project Notification Form shall be completed prior to the commencement of work, indicating that the BMP will be followed during the bridge maintenance activities. It shall be signed by the appropriate individual then submitted to and retained by the MTO Regional Environmental Section, or, for forms completed by Maintenance service providers, by the Regional Operations Office.

An electronic version of MTO Project Notification Form is available online at [MTO Environmental Standards and Practices](#).

7 LIKE-FOR-LIKE CULVERT REPLACEMENT

7.1 SCOPE

This MTO Best Management Practice (BMP) applies to the like-for-like replacement of a culvert in a waterbody identified as supporting fish and fish habitat.

Culvert replacements using this BMP shall be installed in accordance with the MTO Highway Drainage Design Standards with respect to culvert sizing, embedment with appropriate material, and safe fish passage as outlined in the Operational Constraints and Protection Measures.

This BMP for Like-for-Like Culvert Replacement may be used for the following:

- Replacement of an existing culvert with a new culvert of equal or lesser length.
- An increase or decrease in culvert width that does not negatively impact fish passage.
- The replacement of a perched or undersized culvert as long as the fish passage provided by the new culvert does not have a negative effect on fisheries management objectives or expand the range of aquatic invasive species.

This BMP for Like-for-Like Culvert Replacement may not be used for the following:

- In-water work/activities outside of the appropriate in-water work timing windows.
- Installation of culvert liners.
- Channel realignment.
- Additional fill (i.e. increased footprint) placed below the high water level.
- When federally listed aquatic species at risk are present.

Activities undertaken in relation to the project shall be in compliance with the federal Species at Risk Act and the provincial Endangered Species Act. It is up to the user of this BMP to obtain all necessary permits to proceed with the work.

7.2 ADDITIONAL REFERENCES

- [DFO Interim Code of Practice: End-of-Pipe Fish Protection Screens for Small Water Intakes in Freshwater](#)
- [MTO Highway Drainage Design Standards](#)
- [Great Lakes Fisheries Commission Sea Lamprey Control Map](#)

- [DFO Swim Performance Online Tools](#)

7.3 MAINTENANCE/CONSTRUCTION PROCEDURES

7.3.1 POTENTIAL IMPACTS TO FISH AND FISH HABITAT

- Infilling floodplain fish habitat with temporary construction access ramps and/or permanent road approaches or abutments (some fish species such as pike rely on the floodplain during high flows for fish passage and/or spawning).
- Removal of riparian vegetation and cover along the banks or shoreline of a waterbody.
- Removal of edge habitat (e.g. undercut bank, shallower areas with lower velocity, aquatic vegetation).
- Creation of barriers to fish movement (e.g. perched crossings, velocity barriers, alteration of the natural stream gradient, restrictive causeways resulting in the loss of floodplain which is used by fish for passage during high flows).
- Introduction of sediments, concrete and other deleterious substances (e.g. salt, paint, solvents, oil and grease) into waterbodies.
- Operation of machinery may impact habitat on the waterbody banks and bed and result in erosion and sedimentation.
- Death of fish.

7.3.2 OPERATIONAL CONDITIONS

Like-for-like culvert replacement activities as outlined in the scope of this BMP that meet the following conditions and are carried out in accordance with all of the following operational constraints, protection measures and submission requirements are considered to be in compliance with the Fisheries Act and the Fisheries Protocol. As such these works may proceed without further review.

This BMP can only be used if all applicable listed operational constraints and protection measures can be followed. If the BMP cannot be used, proceed to Step 4 of the Fisheries Protocol.

7.3.3 OPERATIONAL CONSTRAINTS AND PROTECTION MEASURES

7.3.3.1 PROVINCIAL STANDARDS

Fish Protection

Fish protection including in-water work timing windows shall be conducted according to OPSS.PROV 182.

Dewatering and Temporary Flow Control

Dewatering activities and/or temporary flow control shall be according to OPSS.PROV 517 and OPSS.PROV 182.

Placement of Aggregates in Waterbodies

The use of aggregate in waterbodies shall be according to OPSS.PROV 825 and OPSS.PROV 1005.

Equipment Use

Use of equipment shall be according to OPSS.PROV 182.

Preservation of Riparian Vegetation

Removal of riparian vegetation shall be according to OPSS.PROV 182.

Erosion and Sediment Control

The installation, monitoring, maintenance, and removal of temporary erosion and sediment control measures shall be according to OPSS.PROV 182 and OPSS.PROV 805.

Restoration of Disturbed Areas

Vegetation protection and rehabilitation shall be according to OPSS.PROV 182 and OPSS.PROV 804.

Management of Excess Materials

All excess material shall be managed according to OPSS.PROV 180.

7.3.3.2 GENERAL

- Like-for-like culvert replacement activities shall be scheduled to prevent disruption to sensitive fish life stages by adhering to appropriate in-water work timing windows.
- All in-water works shall be conducted in an isolated area "in-the-dry" while maintaining the current waterbody flows on the downstream end.
- The new culvert shall provide the appropriate gradient and waterbody bed elevation consistent with conditions in the natural channel in order to provide free flow of water through the culvert, maintain fish passage and mitigate channel erosion or down cutting during all flows.
- Sediment laden dewatering discharge shall be pumped into a vegetated area or settling basin to prevent sediment and other deleterious substances from entering any waterbody.

- Within the isolated area, accumulated sediment and excess material shall be removed and the waterbody bed shall be stabilized and restored to the original shape and bottom gradient with aggregates sized to match the upstream and downstream sections of the waterbody before removing the worksite isolation measures.
- The waterbody bed under the worksite isolation measures shall also be stabilized and restored as described above during the final removal of the worksite isolation measures.
- If perched culverts are encountered, review design considerations to ensure that culvert sizing, embedment, and scour protection in the new design meet ministry standards.

7.4 SUBMISSION REQUIREMENTS

A MTO Project Notification Form shall be completed prior to the commencement of work, indicating that the BMP will be followed during the culvert replacement. It shall be signed by the appropriate individual then submitted to and retained by the MTO Regional Environmental Section, or, for forms completed by Maintenance service providers, by the Regional Operations Office.

An electronic version of MTO Project Notification Form is available online at [MTO Environmental Standards and Practices](#).

8 DITCH MAINTENANCE WITHIN 30 METRES OF A WATERBODY

8.1 SCOPE

This Best Management Practice (BMP) applies to the maintenance of existing ditches within 30 metres of the high water level of a waterbody that supports fish and fish habitat, including ditches and seasonal waterbodies within the highway rights-of-way that support fish and fish habitat.

This BMP for ditch maintenance within 30 metres of waterbody BMP may be used for the following:

- Activities to restore the grades and positive drainage of ditches to the original highway design criteria, including:
 - Removal of accumulated sediment;
 - Removal of vegetation;
 - Repair of damaged ditch embankments and shoulders;
 - Cleaning of ditch outlet pipes; and/or,
 - Cleaning of entrance culverts that have deposited accumulated sediment into the ditch being maintained.

This Ditch Maintenance BMP may not be used for the following:

- When fish are present;
- In-water work/activities outside of the appropriate in-water work timing windows;
- When federally listed aquatic species at risk are present or significant fish habitat is present;
- Construction of a new ditch; and,
- Channel realignment.

Activities undertaken in relation to the project shall be in compliance with the federal Species at Risk Act and the provincial Endangered Species Act. It is up to the user of this BMP to obtain all necessary permits required to proceed with the work.

8.2 MAINTENANCE/CONSTRUCTION PROCEDURES

8.2.1 POTENTIAL IMPACTS TO FISH AND FISH HABITAT

- Removal of habitat features from ditch, adjacent banks and riparian zone (resulting in loss and/or reduction in diversity of habitat).
- Removal or disruption of migratory corridor (barrier to fish migration).
- Sedimentation of spawning, rearing and food production areas.
- Reduction in food supply (allochthonous or autochthonous inputs).
- Reduction or disruption of invertebrate production.
- Reduced water quality (increased turbidity, sedimentation, warming of water).
- Changes to flow regime (especially base flows).
- Drainage works may negatively impact adjacent wetlands by lowering the water table.
- Introduction of deleterious substances.
- Excessive loss of riparian vegetation.
- Disturbance to the banks and the bottoms of ditches from the use of heavy equipment.
- Decreased channel/bank stability to the receiving waterbody.

8.2.2 OPERATIONAL CONDITIONS

Ditching maintenance activities as outlined in the scope of this BMP that meet the following conditions and are carried out in accordance with all of the following operational constraints, protection measures and submission requirements are considered to be in compliance with the Fisheries Act and the Fisheries Protocol. As such these works may proceed without further review.

This BMP can only be used if all applicable listed operational constraints and protection measures can be followed. If the BMP cannot be used, proceed to Step 4 of the Fisheries Protocol.

8.2.3 OPERATIONAL CONSTRAINTS AND PROTECTION MEASURES

8.2.3.1 PROVINCIAL STANDARDS

Fish Protection

Fish protection including in-water work timing windows shall be conducted according to OPSS.PROV 182.

Dewatering and Temporary Flow Control

Dewatering activities and/or temporary flow control shall be according to OPSS.PROV 517 and OPSS.PROV 182.

Equipment Use

Use of equipment shall be according to OPSS.PROV 182.

Preservation of Riparian Vegetation

Removal of riparian vegetation shall be according to OPSS.PROV 182.

Erosion and Sediment Control

The installation, monitoring, maintenance, and removal of temporary erosion and sediment control measures shall be according to OPSS.PROV 182 and OPSS.PROV 805.

Restoration of Disturbed Areas

Vegetation protection and rehabilitation shall be according to OPSS.PROV 182 and OPSS.PROV 804.

Management of Excess Materials

All excess material shall be managed according to OPSS.PROV 180.

8.2.3.2 GENERAL

- Ditch maintenance activities shall be scheduled to prevent disruption to sensitive fish life stages by adhering to appropriate in-water work timing windows.
- Ditch maintenance activities shall not be conducted within the receiving waterbody or within a wetland.
- Ensure erosion and protection measures are taken, as appropriate for the site.

8.3 SUBMISSION REQUIREMENTS

A MTO Project Notification Form shall be completed prior to the commencement of work, indicating that the BMP will be followed during the ditch maintenance. It shall be signed by the appropriate individual then submitted to and retained by the MTO Regional Environmental Section, or, for forms completed by Maintenance service providers, by the Regional Operations Office.

An electronic version of MTO Project Notification Form is available online at [MTO Environmental Standards and Practices](#).

APPENDIX

F

AQUATIC
EFFECTS
ASSESSMENT
SUMMARY
TABLE

TEMPLATE D4: AQUATIC EFFECTS ASSESSMENT SUMMARY TABLE

Project W.P No	Project Title	Waterbody Name
4074-11-00	Highway 417 Bridge Rehabilitations (Contract 2B)	Cote Martin Drain
Fisheries Assessment Specialist		Date
Robin LeCraw		December 21, 2021
PROPOSED WORKS, ENVIRONMENTAL AND MANAGEMENT CONTEXT		
Proposed Works	Construction of a noise barrier wall between the Highway 417 / OR174 Eastbound ramp and Cote Martin Drain. The noise wall will not intersect the drain or require in-water works but will include installation of the north end of the wall within 11 m of the watercourse, and a rip rap drainage pad within 4 m of the watercourse. The south end of the noise wall will involve spanning the existing culvert conveying the Tributary of Cote Martin Drain approximately 30 m from the drain but will not require in-water works or modification of the culvert.	

Fish and Fish Habitat

Cote Martin Drain is a municipal drain which appears to originate approximately 1 km west of the most upstream culvert inlet west of Highway 417 as surface run-off and drainage outflow from adjacent wetlands. The drain flows east under Highway 417, then south under OR 174, then meanders south out of the ROW, converging with flows from the Tributary to Cote Martin Drain, and South Cyrville Drain, eventually draining into Green's Creek. The three culvert locations under OR 174 and the reach downstream (adjacent to the Highway 417 / OR 174 ramp) were assessed for fish and fish habitat existing conditions as part of the 2019 Existing Conditions Report (WSP 2019). Refer to Existing Conditions Report (WSP 2019) and Templates D2A (Table 2.1 in the Impact Assessment Report) and D2B (Table 2.2 in the Impact Assessment Report) for details. The reach downstream of OR 174 was re-assessed during the 2021 field investigation and is described greater detail below.

Downstream of the culvert under OR 174 eastbound lanes, the Cote Martin Drain flows out of the ROW as riffle habitat within a distinct channel and defined banks for approximately 25 m before becoming flat habitat for the remainder of the reach (75 m). Both banks were stabilized by dense vegetation such as forbs and grasses including Goldenrod (*Solidago sp.*) and Reed Canary Grass (*Phalaris arundinacea*). The mean wetted width within the riffle habitat was approximately 3.9 m, with a mean wetted depth of approximately 0.10 m. The mean bankfull width of the riffle habitat was approximately 5 m, with a mean bankfull depth of approximately 1 m. The mean wetted width within the flat habitat was approximately 2.8 m, with a mean wetted depth of approximately 0.35 m. The mean bankfull width of the flat habitat was approximately 5 m, with a mean bankfull depth of approximately 1 m. The substrates within the riffle reach were comprised of cobbles (70%), gravel (20%) and sand (10%). The substrates within the flat reach were comprised of silt (50%), sand (30%), cobbles (10%) and detritus (10%). There was minimal instream and overhanging cover (e.g., grasses, cattails, and downed branches) present within the downstream reach. Riparian trees and shrubs including Common Buckthorn (*Rhamnus cathartica*), Manitoba Maple (*Acer negundo*), and American Elm (*Ulmus americana*) shaded some portions of the watercourse (35%). In-stream vegetation was present in scattered clumps within this reach and composed of only Curly-leaf Pondweed (*Potamogeton crispus*), while overhanging vegetation such as Reed Canary Grass and Goldenrod were present and shaded approximately 35% of the watercourse. Bank erosion was observed throughout the reach at the time of assessment and was measured to be approximately 0.2 m undercut in most places. There was no evidence of groundwater inputs at the time of assessment.

Fish sampling conducted in 2017 resulted in the capture of warmwater tolerant baitfish and forage fish species. Fish were not observed during the 2021 site investigation; however, a minnow trap was observed on the shoreline, suggesting the continued presence of small-bodied fishes. As such, this watercourse is considered direct warmwater fish habitat.

Fish Passage	Direct fish use is present throughout this watercourse; therefore, fish passage should be maintained. No barriers were observed throughout the assessed reach, and only seasonal barriers of water level and dense vegetation were noted in the Tributary flowing into the drain north of Cyrville Road. No works are proposed within the watercourse, and no new watercourse crossings or alteration to existing watercourse crossings are proposed as part of these works. Therefore, fish passage will be maintained in the current conditions.
Fisheries Management Objectives (FMO)/In-Water Work Timing Window	No Fisheries Management Objectives have been identified for this watercourse. In-water Works are to be permitted during the warmwater timing window of July 1 to March 14 only, in accordance with MNR/Kemptonville District correspondence.
RESIDUAL EFFECTS ASSESSMENT	
<p>Negative residual effects: No Negative residual effects are anticipated following implementation of identified mitigation measures.</p>	
1.	
2.	
Spatial Scale	N/A
Duration	N/A
Intensity	N/A
<p>DOCUMENTATION OF FISH AND FISH HABITAT IMPACT - Rationale and Conclusions Considering that the severity (spatial scale, duration, intensity) of all negative residual effects, taken together, are used to determine, provide a brief rationale for why <u>is or is not</u> likely to occur by addressing the following questions below:</p>	

<p>1.0 Will the project result in the death of fish?</p> <p>No in-water work is required. All works adjacent to the watercourse will be isolated with appropriate mitigation measures including an erosion and sediment control plan.</p>	<p>YES <input type="checkbox"/></p>	<p>NO <input checked="" type="checkbox"/></p>
<p>2.0 Will the project result in harmful alteration, disruption or destruction of fish habitat?</p> <p>No in-water work is required. All works adjacent to the watercourse will be isolated with appropriate mitigation measures including an erosion and sediment control plan. No permanent impacts from the new noise barrier wall to be installed between 11 and 120 m away from the watercourse are anticipated to affect fish habitat in Cote Martin Drain.</p>	<p>YES <input type="checkbox"/></p>	<p>NO <input checked="" type="checkbox"/></p>
<p>Provide a brief overall concluding statement about whether the death of fish or HADD of fish habitat is likely/not likely.</p>		
<p>Fisheries Assessment Specialist Recommendation: <i>Check one of the boxes based on the summary of findings.</i></p> <p><input checked="" type="checkbox"/> Proceed with project with identified mitigation measures (Complete MTO Project Notification Form)</p> <p><input type="checkbox"/> Recommendation to send project for review by DFO</p>		
<p>MTO Review of the Fisheries Assessment Specialist’s Recommendation (to be completed by MTO):</p> <p>All projects identified by the Fisheries Assessment Specialist as likely to result in the death of fish or HADD of fish habitat require a review by MTO prior to completion of any forms or submission to DFO. Only once advised by MTO should the Fisheries Assessment Specialist complete a DFO Request for Review Form to submit to MTO for signature and submission to DFO.</p>		