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MEMO

Date:	August 8, 2024	**File:**	2020-3858
To:	Achyut Adhikari	**Page:**	Page 1 of 19
From:	Erica Graham, M.Sc., P.Biol.		
Project:	Wellington Bridge Replacement		
Subject:	Environmental Impact Assessment: Update		

1 INTRODUCTION

1.1 Project Background

Wellington Bridge is a three-span concrete arch bridge that carries traffic along 102 Avenue over Ramsey Ravine in Edmonton, AB. The bridge was constructed in 1932; it is now in poor condition and has reached the end of its service life. Since 2014, the bridge has been supported by a temporary shoring system to maintain vehicular traffic until the bridge is replaced. In 2020, the City of Edmonton (the City) retained Associated Engineering Alberta Ltd. (Associated) to undertake the preliminary design, detailed design, and construction services to replace Wellington Bridge, including a shared-use path.

Ramsey Ravine is part of the North Saskatchewan River valley and is within the North Saskatchewan River Valley Area Redevelopment Plan (ARP), Bylaw 7188.[1] In September 2021, Associated prepared an Environmental Impact Assessment (EIA) report following the Terms of Reference for the North Saskatchewan ARP – A Guide to Completing Environmental Impact Assessments.[2] The City's Planning and Environment Services branch issued a sign-off letter (reference no. 407852315-001; **Appendix A**) pertaining to the EIA report on December 1, 2021.

The EIA report was based on a preliminary design finalized in May 2021, which included three replacement options: a single-span steel girder bridge, a three-span haunched concrete bridge, and a modern concrete arch bridge. All three options were anticipated to require a similar footprint for construction and operation. After the EIA was signed off and the detailed design for the modern concrete arch bridge was initiated, the project was suspended by the City in February 2022. In November 2023, the City notified Associated of their intent to restart the project, and the project was restarted in January 2024. The preliminary design was updated in April 2024 to include changes to the bridge and landscape architectural components, changes to the design to comply with changes in codes and standards since the project was suspended, and updates to the geotechnical information.

August 2024 update: the April 2024 design is currently being updated to a clear-span girder bridge, with both steel and concrete girders being considered as options. This change has been requested by the City of Edmonton due to concerns related to project cost and schedule. Design changes will not affect the overall project footprint for construction; permanent bridge footprint should be reduced (as compared to both the April 2024 designs) because piers are eliminated with a new clear span bridge. Included in **Appendix A** is the sign-off provided by the City of Edmonton in June 2024. This memo serves as an addendum to the approved EIA report (KP21-60 from December 2021 and AA24-20 from June 2024); it reflects the following specific updates to the EIA report:

[1] City of Edmonton. 2018. North Saskatchewan River Valley Area Redevelopment Plan, Bylaw 7188.
[2] City of Edmonton. 2020. Terms of Reference for the North Saskatchewan ARP – A Guide to Completing Environmental Impact Assessments.

- Project components that changed with 2024 detailed design updates; and
- Changes to environmental regulatory requirements that occurred while the project was suspended.

This memo is intended to be read in conjunction with corresponding sections in the EIA report.

1.2 The Property

Wellington Bridge crosses over Ramsey Ravine on 102 Avenue NW between Wellington Crescent NW and Churchill Crescent NW, on lands owned by the City. During the preliminary design update, an updated project construction footprint was developed, with additional temporary workspaces for the demolition of the existing bridge and construction of the new bridge. The project area remains confined to SE 01-053-25 W4M, and an updated Project Overview and Zoning figure can be found in **Appendix B**, **Figure 1**. Section 4 of this memo details how the project area was selected.

Zoning categories have changed since the EIA report was issued; however, boundaries have remained the same (**Appendix B**, **Figure 1**). Zoning in the project area is Small Scale Residential, Neighbourhood Parks and Services, and River Valley. The project area still in the North Saskatchewan River Valley and Ravine System overlay, with administration under Bylaw 7188.

An updated search of the Environmental Site Assessment Repository shows no records of contamination near Wellington Bridge.[3] The EIA report indicated that given the age of Wellington Bridge, hazardous materials may need to be managed during removal, such as lead paint or asbestos. The report also recommended a hazardous building materials assessment be completed before the tender phase of the project. Hazardous building materials testing was conducted by Thurber Engineering Ltd. (Thurber) in April 2024, and no hazardous materials were identified (**Appendix C**).

Updated details on the regulatory context of the project are provided in Section 5 of this memo.

2 ENVIRONMENTAL ASSESSMENT METHODS

2.1 Desktop Assessments

Associated reviewed the publicly available data and information that were used to identify the baseline environment and potential environmental constraints in the project area for the EIA report for any updates to the data. The information was reassessed for additional potential environmental constraints in the additional temporary workspaces. Sources of information that were reviewed included:

- AbaData (Agricultural Regions of Alberta Soil Inventory soil data, historical resource values, Alberta Biodiversity Monitoring Institute wetland inventory, and wildlife areas);[4]

[3] Alberta Environment and Protected Areas. 2023. Environmental Site Assessment Repository. Available online: https://www.esar.alberta.ca/ESARmain.aspx. Accessed March 12, 2024.
[4] AbaData. 2023. Available online: https://abadata.ca/abadata3. Accessed March 12, 2024.

- Alberta Conservation Information Management System database;[5]
- Environmental Sensitivity – Score Map;[6]
- Fisheries and Wildlife Management Information System database;[7] and
- Urban Primary Land and Vegetation Inventory.[8]

2.2 Field Assessments

Since the EIA report has been completed, Associated's Kristen Andersen, P.Biol., and Sascha Bachmann, M.Sc., P.Biol., completed an additional field assessment in the project area on March 19, 2024. The purpose of this assessment was to collect additional site data to be used in preparing the naturalization designs and soil bioengineering designs for restoration of:

- The temporary workspaces within the ravine;
- The channel of the unnamed watercourse after the existing culvert under the bridge is daylighted; and
- The channel on the south side of the bridge where a temporary culvert will be required if an access ramp is constructed (additional details provided in Section 4 of this memo).

The footprint for these designs is in the updated preliminary design drawings in **Appendix D.**

3 ENVIRONMENTAL CONTEXT

3.1 Geology, Geomorphology, and Soils

There are no updates to geology, geomorphology, or soils since the EIA report. The additional project area to account for the temporary workspaces selected when the preliminary design was updated is within the areas previously mapped in the geotechnical investigation report prepared by Thurber in 2021. Thurber's report is included in the EIA report (**Appendix A**).

3.2 Groundwater, Surface Water, and Fish Habitat

There are no updates to groundwater, surface water, and fish habitat since the EIA report. The additional project area to account for the temporary workspaces selected when the preliminary design was updated is within the areas previously mapped in the EIA report. An updated surface map showing the updated project area is provided in **Appendix B**, **Figure 2**. This map also shows two *Public Lands Act* Dispositions (DLO210109 and DLO210110) held by the City on parts of the unnamed watercourse south of the project area, which were issued after the EIA report.

[5] Alberta Parks. 2022. Alberta Conservation Information Management System (ACIMS). Available online: https://www.albertaparks.ca/albertaparksca/management-land-use/alberta-conservation-information-management-system-acims/. Accessed March 12, 2024.
[6] City of Edmonton. 2022. Environmental Sensitivity – Score Map. Available online: https://data.edmonton.ca/Environmental-Services/Environmental-Sensitivity-Score-map-/mrgp-3hq5. Accessed March 12, 2024.
[7] Government of Alberta. 2024. Fish and Wildlife Internet Mapping Tool. Available online: https://geospatial.alberta.ca/FWIMT_Pub/Viewer/?Viewer=FWIMT_Pub. Accessed March 12, 2024.
[8] City of Edmonton. 2022. Urban Primary Land Vegetation Inventory. Available online: https://data.edmonton.ca/Environmental-Services/Urban-Primary-Land-Vegetation-Inventory-2015/5x9p-z4dg. Accessed March 12, 2024.

3.3 Vegetation

There are minimal updates to the vegetation in and surrounding the project area since the EIA report. The City Trees Map[9] has been updated since the EIA report was completed, and an updated vegetation map, including the updated project area, is provided in **Appendix B**, **Figure 3**. Currently, three boulevard trees are in the project area, compared to eight previously shown in the EIA report. Additional natural stand trees are now included in the project area due to the addition of the temporary workspaces. No new elemental occurrences from were identified in the Alberta Conservation Information Management System database during this update review, compared to those included in the EIA report.

3.4 Wildlife

The Fisheries and Wildlife Management Information System database revealed three additional terrestrial wildlife species reported within a 2 km radius of the project area. **Table 3-1** lists these species, their conservation concern and status, preferred habitat, and potential to occur in the project area. An updated wildlife map showing the updated project area is provided in **Appendix B**, **Figure 4**.

Table 3-1 Additional Wildlife Species Previously Recorded Within 2 km of the Project Area

Species	General Status of Alberta Wild Species	*Wildlife Act*	*Species at Risk Act*	COSEWIC Status	Preferred Habitat and Potential to Occur in Project Area
Canadian toad (*Anaxyrus hemiophrys*)	May be at risk	NA	NA	NA	• Boreal and parkland habitats. • There is moderate potential for this species to occur in the project area.
Plains garter snake (*Thamnophis radix*)	Sensitive	NA	NA	NA	• Meadows and prairies adjacent to water sources such as ponds, streams, and marshes. • There is low potential for this species to occur in the project area.
Red-sided garter snake (*Thamnophis sirtalis*)	Sensitive	NA	NA	NA	• Near water in various habitats, including forests, fields, prairies, streams, wetlands, meadows, marshes, and ponds.

[9] City of Edmonton. 2024. Trees Map. Available online: https://data.edmonton.ca/Environmental-Services/Trees-Map/udbt-eiax. Accessed May 13, 2024.

Species	General Status of Alberta Wild Species	*Wildlife Act*	*Species at Risk Act*	COSEWIC Status	Preferred Habitat and Potential to Occur in Project Area
					• There is moderate potential for this species to occur in the project area.

COSEWIC – Committee on the Status of Endangered Wildlife in Canada; NA – Not Applicable

Since the EIA report was completed, the two adult bat carcasses and the fecal matter collected from beneath Wellington Bridge were sent for genetic testing. The DNA test results confirmed that the carcasses and fecal matter were associated with the little brown bat (*Myotis lucifugus*). Additional details can be found in the bat mitigation plan prepared by Associated in April 2024 (**Appendix E**).

3.5 Historical Resources

A review of historical resources indicated no additional historical resource listings other than those previously identified in the EIA report. Updated details on the *Historical Resources Act* permitting are provided in Section 5 of this memo.

4 PROJECT DETAILS

The EIA report was based on a preliminary design report finalized in May 2021, which included three replacement options: a single-span steel girder bridge, a three-span haunched concrete bridge, and a modern concrete arch bridge. All three options were anticipated to require a similar footprint for construction and operation, which were encompassed within the project area.

The Single-Span Steel Girder Bridge option was not selected, and any reference to it in the EIA report no longer applies to the project.

The Three-Span Haunched Concrete Bridge option was not selected, and any reference to it in the EIA report no longer applies to the project.

Through the preliminary design Associated initially recommended the modern concrete arch bridge, which the City chose to proceed with for the detailed design. August 2024 updates have shifted this bridge design to a girder bridge. Preliminary design drawings provided with this amendment (**Appendix D**) currently show the concrete arch design; however, updates are currently in progress to revise this option to a single span girder bridge. No changes to the overall footprint are expected. Updated drawings are to be provided to the City of Edmonton upon completion.

Construction is anticipated to begin two years earlier than indicated in the EIA report; the duration of construction is anticipated to be similar to the timeline indicated in the EIA report. The current estimated timeline of construction includes the following milestones:

- Contractor mobilization: August 2025
- Demolition: Begin in September 2025
- Substantial completion: October/November 2026
- Final completion: July 2027

The existing road right-of-way for 102 Avenue is 30.6 m, as confirmed from the cadastral base plan. Based on the proposed out-to-out bridge width of 23.78 m, the new bridge and widened approach roads will fit within the existing right-of-way. Preliminary design drawings are included in **Appendix D**. To facilitate construction access into the ravine and for general site operations, additional space will be required during construction beyond the 30 m right-of-way width. Land titles indicate that the affected properties are owned by the City. Although a part of the new northeast node is currently shown as being located outside the existing right-of-way, this node development is in the process of being reduced such that the area does not encroach outside of the right-of-way. Land titles indicate that the adjacent property is owned by the City.

In the EIA report, Associated expected that the primary laydown area will be on the closed part of 102 Avenue, immediately adjacent to the bridge, and that there may be some encroachment onto the boulevards and surrounding paths at the top of the ravine. The report also noted that some laydown of materials within the ravine should be expected during construction, and that due to the size of the existing bridge, relatively large demolition equipment will likely require access to the ravine.

As noted in the preliminary design update, the area available for the contractor laydown is constrained by Wellington Crescent east of the existing bridge and Churchill Crescent to the west. There is City-owned property on the southwest corner which could also be used to provide additional space for the contractor laydown. Temporary traffic accommodation measures could be used to further increase the available laydown area to the alley east of the bridge and 132 Street to the west.

The ravine can be accessed only by the pedestrian pathway, which has entry points from Churchill Crescent, located 150 m to the north, and from Government House Park, located 800 m to the southeast. However, accessing the site via the pedestrian pathway is undesirable due to sections of steep grade, narrow pathway width, and tight clearances to the natural vegetation on either side. Using the pedestrian pathway would require clearing along its length and may still prove challenging for some construction equipment. To limit the extents of clearing and ensure accessibility for all construction equipment, access is planned from the top of the ravine, on 102 Avenue.

In developing a bridge demolition footprint, we have assumed that the selected contractor will construct an access ramp on the south side of the bridge. The ramp could be constructed to provide access from either the east headslope or the west headslope. Temporary fill will be required in the ravine to provide safe access to a working platform below the bridge so that equipment can operate safely off the bridge during demolition. Before placing temporary fill, a temporary culvert

would be installed with the unnamed watercourse. The footprint in the updated preliminary design drawings (**Appendix D**) is based on a 10 m wide access ramp to provide sufficient room for trucking and demolition equipment, and to allow a safe setback clearance during demolition operations.

We have accounted for the temporary excavation that will be required to construct the new bridge elements and gravel wedge extensions for the headslopes. We have assumed temporary excavations will be completed at a 1:1 slope starting at the base of excavations. A 3 m buffer has been provided along all footprint boundaries for bridge construction to allow for shallower temporary cut and fill slopes, which may be required for construction access or due to unexpected soil conditions. In areas where only roadway construction will occur, the footprint has been based on the construction area and the expected landscaping tie-ins along the construction boundaries.

The last item considered in determining the construction footprint was the formwork and falsework required for the concrete elements, including the abutment backwall, wingwalls and bridge deck. The construction footprint accounts for access walkways on both sides of the new bridge to allow for concrete deck placement, concrete deck finishing, exterior concrete finishing, installation of pedestrian railing, and installation of lighting fixtures.

5 REGULATORY FRAMEWORK

The completed and in-progress permitting required for the project were summarized in **Table 5-1** of the EIA report. The EIA report noted that these regulatory requirements should be revisited throughout the project planning and detailed design because they are subject to change. Additional regulatory permitting required due to project and regulatory changes is provided in **Table 3-2**. No additional changes to permitting requirements are expected with the design development of single span structure.

Trees in the project area may need to be removed (**Appendix D**). Associated will confirm which trees will be affected during detailed design, in consultation with the City's Urban Forester and Natural Area Operations team.

Table 3-2 Additional Anticipated Environmental Permitting Required for the Project

Legislation	Approval Type	Trigger	Notes on Requirements	Estimated Agency Review Timeline
Municipal				
City of Edmonton Bylaw 18825 (Public Tree Bylaw)	Public Tree Permit	Work within 5 m of the trunk of any boulevard or open-space tree, or within 10 m of any boundary of a natural stand **Bylaw came into force on May 1, 2022**	Submission of a Tree Preservation Plan and/or Tree Protection Plan to the City. A Tree Protection Plan is required for vehicular access, laydown, demolition, or construction activities that do not involve below-ground work, and a Tree Preservation Plan is required for work that requires excavation or grade changes.	2 weeks
Provincial				
Historical Resources Act	Approval	Ground disturbance on lands with a historical resource listing value, or demolition of a historical structure	A *Historical Resources Act* approval (HRA number: 4715-20-0061-003) was issued for the project area on April 13, 2021. An amendment to this approval will be required for ground disturbance in the additional project area identified during the preliminary design update.	1–2 months
Water Act Code of Practice for Watercourse Crossings	Notification	Installation of a temporary crossing in the unnamed watercourse in the temporary workspace on the south side of the right-of-way during construction	Notification requires written specifications and recommendations prepared by a Qualified Aquatic Environmental Specialist if a Type 3	2 weeks (notification period before construction begins)

Legislation	Approval Type	Trigger	Notes on Requirements	Estimated Agency Review Timeline
			crossing is installed and isolation is required during installation because the site is not dry.	
Wildlife Act	Letter of authorization	Removal of the roost used by little brown bat, a listed species, through placing exclusion measures and demolishing Wellington Bridge; required under Section 36(1) of the Act	The process is not well documented. Associated has been communicating with the provincial bat specialist regarding the letter of authorization. Submission of the bat mitigation plan is anticipated to support the application.	1–2 weeks

6 PROJECT IMPACTS AND MITIGATION MEASURES

6.1 Environmental Impacts

The EIA report details potential environmental impacts in terms of geology, geomorphology, soils, groundwater, surface water, fish habitat, vegetation, wildlife, and historical resources. The potential impacts remain the same as those described in the EIA report. Potential impacts to vegetation and to wildlife, such as nesting birds, are anticipated to have a greater local spatial extents and higher likelihood because clearing for the temporary workspaces will result in an increased project area. However, the spatial extents of impacts will remain local to the project area.

6.2 Cumulative Impacts

Minimal cumulative impacts are still anticipated as part of the project. The project is still expected to have some localized positive impacts on the slope stability and erosion issues in the project area, resulting from the slope naturalization and bioengineering designs that will be completed during detailed design.

6.3 Mitigation Measures

The mitigation measures detailed in the EIA report still apply to the project. Additional mitigation measures to reduce impacts to the maternal bat roosting colony have been developed and are included in the bat mitigation plan in **Appendix E**. Additional mitigation measures and design considerations to reduce impacts are described below.

During the initial preliminary design, a highly landscaped design was planned; however, this was reassessed during the preliminary design update, and a more naturalized approach is now planned for restoring the temporary workspaces after construction. Beneath the new bridge, the headslopes will be covered with riprap. Beside the new headslopes, revegetation is planned, with plant species appropriate to the ravine and restoration techniques to support this success. The disturbed slopes are planned to be restored as follows:

- Where forest existed before construction, rough and loose soil configuration will be applied to slopes 2:1 or flatter to:
  - Reduce surface water runoff and prevent erosion by eliminating soil compaction and improving infiltration.
  - Create conditions ideal for tree growth and establish microsites to promote species diversity.
- Coarse woody debris will be spread, using material salvaged during tree clearing at the site. Coarse woody debris provides wildlife habitat, promotes soil health, creates microsites for plants, mosses, and lichens, creates structural diversity on the forest floor, and contributes to erosion control.
- Native trees and shrubs will be planted to reestablish vegetation naturally found on the ravine slopes and minimize establishment of weeds.
- Where slope is steeper than 2:1 and rough and loose soil configuration cannot be created by the excavator, alternative soil bioengineering treatments will be used to control erosion and establish native woody vegetation, including modified brush layers.
- Topsoil will be salvaged and stockpiled for replacement during slope restoration to ensure soils used in restoration contain native propagules and that the soil biology is appropriate to forest restoration.

The existing culvert will be removed, and the open channel in the unnamed watercourse beneath the bridge will be reinstated; the details will be finalized during the detailed design phase of the project. The watercourse is planned to be daylighted and restored as follows:

- The section of watercourse that currently flows through a culvert will be daylighted, and the natural channel will be established.
- Dense live willow staking will be installed starting at the low-water mark to the top of bank in a 1 m band along each side of the channel. Reduced-density willow staking will be installed along the banks above the high-water mark in a 1 to 2 m wide band. Willow staking prevents toe erosion and undercutting of banks. The underground part of the stem grows roots that bind the soil, and the aboveground portion decreases water velocity to reduce erosion and foster sediment deposition.

The temporary culvert and fill will be removed, and the open channel will be reinstated. This part of the channel currently shows signs of erosion, including failed riprap and exposed geotextile. Restoration is planned to stabilize the channel as follows:

- Fill material will be removed to achieve an elevation similar to that of the adjoining daylighted watercourse.
- Riprap is anticipated to be used because of the steep channel gradient; this will be validated based on hydrotechnical data.
- Soil bioengineering with willow staking at the top of bank on both sides of the riprap will be included in design.

Mitigation measures will continue to be incorporated during design and construction. Some additional considerations identified during the preliminary design update that will minimize construction impacts include:

- The August 2024 design updates will be a single-span girder bridge, which eliminates the need for piers and simplifies the foundations needed in the river valley. This also avoids needing to construct heavy spread footings with micropiles, which were previously required as part of the modern concrete arch bridge.
- Optimizing the footprint of the abutment in order to limit the loading of the existing landslide area to the northwest of the structure.
- The implementation of a clear span bridge option eliminates the need for extensive formwork and falsework associated with the construction of the modern arch bridge option, which reduces the extent of construction activity within the ravine.

7 ENVIRONMENTAL MONITORING

7.1 Construction

The bat mitigation plan (**Appendix E**) outlines additional monitoring to that described in the EIA report, including:

- Inspecting exclusion materials regularly before demolishing the bridge, especially after heavy rain, snow, or high-wind events, and repairing any damaged exclusion materials as soon as possible;
- Inspecting bat boxes for signs of vandalism or damage, and reporting any deficiencies to the site supervisor and City project manager; and
- Reporting all bat sightings to the site supervisor, City project manager, and consulting engineer project manager.

7.2 Post Construction

In addition to the monitoring outlined in the EIA report, the naturalized restoration of the temporary workspaces and the bioengineering where the unnamed watercourse will be daylighted will be inspected during the growing season for two years after construction.

8 PUBLIC, INDIGENOUS, AND STAKEHOLDER ENGAGEMENT

8.1 Background and Engagement Approach

The Wellington Bridge Replacement webpage (www.edmonton.ca/wellingtonbridge) continues to be updated. The most recent update was in December 2023, announcing that detailed design will begin again in 2024 and that construction is anticipated to start in 2025.

8.2 What We Have Heard So Far

Because the project was suspended and restarted only recently, there are currently no additional updates to what was provided in the EIA report.

8.3 Next Steps

A public engagement session is being planned to be held with the Old Glenora Conservation Association and the Edmonton Historical Board in the Glenora area in late May or early June 2024. Additionally, another project update is currently being compiled for the Wellington Bridge Replacement webpage.

9 CONCLUSION

Wellington Bridge was constructed in 1932 and must now be replaced. The replacement is anticipated to begin two years sooner than initially anticipated in the EIA report. The project is proceeding into detailed design with a clear-span girder bridge.

The major environmental sensitivities in the project area continue to include steep slopes with landslide areas, an unnamed watercourse, vegetation in Ramsey Ravine, bird nesting habitat, and a bat colony maternity roost within the existing bridge. These environmental sensitivities require mitigation measures during the planning, design, and construction phases of the project.

Mitigation measures relevant to planning and detailed design include:

- Following applicable geotechnical recommendations made by Thurber and consulting with Thurber during detailed design;
- Commissioning an Alberta Land Surveyor to survey for the bed and shore in the unnamed watercourse; obtaining relevant permits under the *Public Lands Act*;
- Minimizing the footprint in Ramsey Ravine required for project infrastructure and construction;
- Applying for an amendment to the *Historical Resources Act* approval for additional project area to be used as temporary workspaces;
- Applying for a letter of authorization under the *Wildlife Act* to remove the maternity roost through installing exclusion measures on the bridge and demolishing the bridge;
- Coordinating vegetation removal requirements with the City's Urban Forester and Natural Area Operations team, and developing a Tree Preservation Plan following the City's requirements;
- Developing a naturalized restoration plan for areas of Ramsey Ravine that are temporarily disturbed by construction, and including the use of native topsoil, if possible, and deep-rooting, native woody plant species in the restoration;
- Scheduling the removal of vegetation and temporary shoring system and the demolition of Wellington Bridge outside the general nesting period from mid-April to late-August, and ensuring that pre-construction wildlife sweeps are completed by qualified professionals; and
- Implementing and monitoring bat exclusion measures on the bridge before it is demolished, and installing bat boxes as supplemental alternative habitat, as outlined in the bat mitigation plan (**Appendix E**).

During the construction phase, the contractor will be responsible for adhering to general construction mitigation measures. These mitigation measures will be outlined in a project-specific Environmental Construction Operations (ECO) Plan that is accepted by the City and by Associated, as the City's representative. As part of the ECO Plan, the contractor shall be

required to develop an erosion and sediment control plan that is endorsed by a Certified Profession in Erosion and Sediment Control. The contractor is responsible for routine environmental inspections and maintenance throughout the construction phase of the project.

Wellington Bridge can be replaced with minimal environmental impacts for most of the environmental sensitivities if mitigation measures are followed; however, the long-term residual impacts to bats are unknown due to the nature of their ecology.

Comments and conditions from the City's Planning and Environment Services branch sign-off letter for the EIA report (**Appendix A**), as well as comments and conditions from review of this memo, will continue to be incorporated into the planning, design, and construction phases of the project, as applicable.

10 CLOSURE

This memo was prepared for the City of Edmonton to support the City's Planning and Environment Services branch's environmental review process to satisfy the requirements of Bylaw 7188.

The services provided by Associated Engineering Alberta Ltd. in the preparation of this memo were conducted in a manner consistent with the level of skill ordinarily exercised by members of the profession currently practising under similar conditions. No other warranty expressed or implied is made.

Respectfully submitted,

Associated Engineering Alberta Ltd.

Prepared by:

for

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Regulatory Planner

Reviewed by:

Shane Cote, P.Ag.
Manager, Environmental Planning and Compliance

ATTACHMENTS:

Appendix A – Wellington Bridge Replacement Environmental Impact Assessment Sign-off Letter (Reference No. 407852315-001)

Appendix B – Updated Figures

- **Figure 1:** Project Overview and Zoning

- **Figure 2:** Surface Water
- **Figure 3:** Vegetation
- **Figure 4:** Wildlife

Appendix C – Hazardous Building Materials Testing Report

Appendix D – Updated Preliminary Design Drawings

Appendix E – Wellington Bridge Replacement Bat Mitigation Plan

Achyut Adhikari

APPENDIX A – WELLINGTON BRIDGE REPLACEMENT ENVIRONMENTAL IMPACT ASSESSMENT - CITY SIGN OFF

URBAN PLANNING AND ECONOMY
PLANNING AND ENVIRONMENTAL SERVICES

City of Edmonton
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Email: sdrivervalleybylaw@edmonton.ca

June 26, 2024 Reference No. 506222040-001

To: Erica Graham , Associate Engineering
Cc: Joy Sen, Transportation Planning and Design, IIS

From: Achyut Adhikari, Planning and Environment Services

Subject: AA24-20 Wellington Bridge Replacement EIA Update -Sign Off

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We have completed our review of AA24-20 Wellington Bridge Replacement EIA Update. This letter confirms that the Administration has no further concerns with the proposed development under the North Saskatchewan River Valley Area Redevelopment Plan (NSRV ARP).

Please note the proposed development meets the definition of a major facility, and as such, City Council must approve the EIA to ensure the policy requirements of the NSRV ARP are satisfied. The project report reviewed and approved by the administration in 2021 (KP21-60 Wellington Bridge Environmental Impact Assessment) should be a part of the council reporting. In addition, the following advisements and conditions apply to the project.

Comments from Urban Growth and Open Space Strategy (Urban Planning and Environment):
Urban Growth and Open Space (Urban Planning and Environmental Services) reviewed the proposed bridge replacement project. We understand the recent EIA report was prepared considering scope change includes changes to the bridge and landscape architectural component, comply with updated codes and standard and additional geotechnical information. It appears that the project impact footprints are managed within the existing road right of way and no major impacts are expected outside the limit of the existing approval.

Additional space will be required beyond the right of way for construction access and a part of the new northeast node will be located outside the existing road right-of-way. Generally, the bridge replacement with improved pedestrian access will be managed within the previously approved location and the updated report identified additional mitigation measures to ensure proper restoration applied to the additional scope of the work.

We have no major concerns with the proposed design and mitigation options but would like to review the detailed design once available. Please see additional information that we would like to confirm once the project progressed to the detailed design stage.

1. The project at the detailed design stage should provide the most updated information showing exact locations for storage, access locations and restoration plan, short term and long term ESC plan.

2. The landscaping plan should be further revised to avoid extensive rip rap as it appears under the preliminary design. There is no risk of high flow and flood events from the unnamed creek and the overland drainage and sedimentation issues as identified under this project

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should be managed by incorporating bio-engineering solutions. We do not support the extensive rip rap in this particular location. The use of rip-rap should be limited to the close proximity of the piers and significantly unstable wall section and the remainder area could be managed through bio engineering design. We will review detailed designs with revised landscaping drawings to ensure site specific species supporting soil stabilization that are native to the river valley environment are selected.

3. It appears that the project team attempted to minimize the tree removal and prepared a bat mitigation plan to ensure proper relocation of sensitive species through detailed investigation. All the impacted sites including the new work space should be identified for landscaping and restoration plans. The successful implementation of restoration will ensure City's landscaping standard including CCC/FAC

4. We appreciate the project team's efforts on daylighting the section of culvert under the bridge. The detailed design should provide detailed restoration plans that could integrate additional riparian species other than the willow stakes.

Comments from Infrastructure Planning and Design (Engineering Services-Geotechnical):
I reviewed the memo regarding the update to the Environmental Impact Assessment (EIA) for the Wellington Bridge Replacement project prepared by Associated Engineering Alberta Ltd. (AEAL), dated May 17, 2024. It is understood that AEAL prepared the memo to outline changes to the proposed bridge replacement design that may have required modifications or updates to the EIA originally submitted by AEAL on December 01, 2021 and approved for the project in January 2022.

Based on the information provided, it is understood that the footprint of the revised bridge replacement has not altered from that originally assessed thus past geotechnical assessments remain valid. Engineering Services - Geotechnical is included on the project technical design review circulations and we have reviewed various supplemental reports prepared by the Geotechnical Engineer of Record (Thurber Engineering Ltd.) that provided geotechnical assessments for the revised bridge replacement. It is understood that Thurber Engineering Ltd. will be involved in the project going forward and as such it is envisioned that geotechnical issues that may arise during subsequent stages of the project can be adequately mitigated through on-going involvement of Thurber Engineering Ltd. as the Geotechnical Engineer of Record.

Comments from Infrastructure Planning and Design (Engineering Services-Environmental):
Please see separate memo

Comments from Planning Coordination (Environmental Planning)
Environmental Planning has reviewed the updated information and has no comments or concerns with the project.If any other information is needed, please let me know.

Comments from Parks and Roads Services (Natural Area Operations)
1. Thank you for adjusting the Corporate Tree Management Policy (C456C) number and acknowledging the owl and raptor nesting season (Feb15-Apr 15).
2. The Project must apply for a Public Tree Permit at edmonton.ca/treepermit. A Public Tree Permit must be approved for any work within 10m of a natural area before the commencement of work on City Lands, as per the Public Tree Bylaw 18825. A Tree Preservation Plan must be included in the Public Tree Permit application.

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3. All landscape plans should be circulated and reviewed prior to approval. Please consider the use of bio-engineering in this area for restoration along the slopes.
Please note that approved landscape plans are required for the project to qualify for Tree Asset Value Crediting. Credit can only be applied to plantings that are above the required amount determined on the development permit.
4. Coordination with naturalareaoperations@edmonton.ca will be required to ensure our maintenance equipment can still use the trail.

General Conditions for vegetation removal:
1. Upon approval of the plan, a site meeting with Natural Areas will be required to review construction plans and tree protection. This meeting will need to be scheduled a minimum of **four weeks** in advance of the construction start date. This is to review access points, placement of all permanent or temporary construction material required for this project, and to determine tree protection requirements for construction within 5 meters of any City tree or 10 meters from a natural stand. For any vegetation removal, please ensure the area has been clearly staked. Note the laydown area fencing must be installed outside the dripline of any adjacent trees.

2. Please be advised that all costs associated with pruning, removal, tree damage, or replacement shall be covered by the Proponent as per the Corporate Tree Management Policy. Natural Areas will schedule and carry out all required tree work involved with this project. Please contact naturalareaoperations@edmonton.ca to arrange this meeting.

3. Any soil damage or compaction compromising the tree's root system within the parkland space shall be corrected by and at a cost to the Proponent. Please be advised that all costs associated with soil remediation, watering, and tree protection shall be covered by the Proponent as per the Corporate Tree Management Policy.

4. Please note that the removal of vegetation has the opportunity to impact birds and bird habitat. Protection of migratory and non-migratory birds is legislated federally and provincially and enforceable regardless of whether or not individual environmental reviews conducted in accordance with the River Valley Bylaw include discussions of these topics. The onus is on the individual or company conducting habitat disturbance or construction activities to ensure that due diligence has been exercised to avoid harm to migratory and non-migratory birds. Individuals or companies that do not avoid harm to most wildlife species risk prosecution under the *Wildlife Act* and, in some cases, the *Species at Risk Act*. In the case of migratory birds, prosecution under the *Migratory Birds Convention Act* is also possible.

Comments from Parks and Roads Services (Urban Forestry)

1. Immediate tree conflicts exist within this project on either side of the Wellington Bridge. A site meeting with the City of Edmonton Urban Forestry will be required prior to design approval. Please contact North Projects Forester Laurie Lacey with Urban Forestry at 780-868-2174 to schedule an on-site meeting as soon as possible, to review potential tree conflicts and take steps to avoid impacts.

2. If the proponent is requesting tree removal, Forestry may approve the removal with the condition that the tree value is paid by the proponent as compensation for the loss of canopy and that the proponent provides proof that the Community League has been notified of the tree removal request. All costs associated with the removal, replacement or transplanting of trees shall be covered by the Proponent as per the Corporate Tree Management Policy (C456C). Forestry will schedule and carry out all required tree work involved with this project. Please contact 311 to be

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connected with Urban Forestry to arrange this meeting. This meeting must be scheduled a minimum 4 weeks in advance of the construction start date or use of the lay-down area. All trees must be protected until removal plans are approved and being actively coordinated by the project with Urban Forestry.

3. Prior to construction the project must apply for a Public Tree Permit for all trees on City of Edmonton property within 5m of the construction site or active haul route. These trees will require tree protection and possibly anti-compaction methods prior to construction as per Public Tree Bylaw 18825. For more information on City of Edmonton Tree Protection, please visit https://www.edmonton.ca/treepermit If tree damage occurs, remediation or removal will be enforced and shall be covered by the proponent as per the Corporate Tree Management Policy (C456C) and Public Tree Bylaw 18825. This includes compensation for tree value on full or partial tree loss as well as operational and administrative fees.

4. There appears to be work within City of Edmonton Natural Areas which may affect natural area tree stands. Please contact Natural Areas Forestry Team at naturalareaoperations@edmonton.ca for additional direction.

Comments from River Valley Parks and Facilities

No concerns are this time. Please include River Valley Parks & Facilities (Bryan.Turner@edmonton.ca and Heather.Knowles@edmonton.ca) in future construction start-up meetings and pre-site visits.
Will need to confirm trail detour signage and requirements prior to construction starting

Open Space Inspection Services comments

1. A pre-construction inspection prior to accessing the site and a post-construction inspection once parkland restoration has occurred will be conducted by Open Space Inspection Services. Email: parkslandscapeinventory@edmonton.ca to request inspections.
2. This project may require a Parkland Access Permit. Please contact Parkland Management to obtain a permit prior to scheduling a pre site inspection. Email: prsparklandmanagement@edmonton.ca
3. There is no unapproved parking on Parkland. Unnecessary movement on any Park areas or Boulevards is not permitted.
4. Vehicle and equipment travel in all areas must not traverse open space and must be limited to specified and planned minimally impactful haul routes. Travel must also be away from low areas where water retention may occur. Travel must also not occur during inclement weather or within a minimum of 48 hours after major inclement weather events.
5. In the case where there is significant damage to the site, a repair and restoration plan will have to be tailored to the scope and complexity of the damage and approved by PARS. The cost and implementation of this will be borne by the program, not PARS Open Space Operations. These steps will be the responsibility of the proponent prior to the inspection and acceptance by PARS.
6. All damages to natural areas must be restored to pre-existing conditions with approved (by NAO) natural grasses/vegetation as required and the maintenance (watering, weed control and public access control measures) of restored natural areas will be the responsibility of the proponent until the natural area planting material is established, inspected and accepted by PARS.

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7. Any damaged ornamental turf areas shall be repaired with sod (topdress and seed is not acceptable) and all maintenance (erosion control, watering, mowing, public access control and weed control) of the restored areas will be the responsibility of the proponent until established, inspected and accepted by PARS. All sod must be butt joined to the existing turf surfaces. Blending of these areas is not acceptable. A 50mm depth cut for sod application is not adequate. A minimum of 100mm depth and vertical cut is required, followed by adding and rolling topsoil prior to sod placement. Soil compaction mitigation must occur on subsoil areas prior to topsoil placement.
8. Any lay down, staging or haul route area on Parkland must be approved and fenced, with no vehicular or project activity outside of the fenced area. There should be no access to the lay down, staging or haul route area to ensure public safety. The restoration of the entire area must be repaired to the existing conditions as per ornamental turf repair above. Soil compaction protection, aeration and re-sodding; including the maintenance (e.g. watering, mowing, weed control and public access control measures) of restored turf areas will be the responsibility of the proponent until the sod is established and accepted by PARS. Email: parkslandscapeinventory@edmonton.ca to request a laydown area pre inspection.
9. Public access control measures should be in place and maintained post construction to prevent the public from accessing areas that have been newly landscaped. In order to ensure the success of the restoration areas, the project should also consider the installation of fencing and informational signage around areas to discourage disturbance of the area by the public. Please be aware that native species can take longer to establish than many ornamental landscaping species or traditional turf grasses. It is for this reason that considerations for protection of restoration areas are strongly recommended.
10. Soil compaction protection (rig matting or other approved) on the site is required prior to any activity (normally where there is a large number of existing trees in close proximity).
11. All other damages to parkland inventory (curbs, roads, trails, paths, furniture, fixtures, signs, trees, shrub beds, etc) must be restored to pre-existing conditions and CoE Construction Standards and PARS inspection and acceptance.
12. Erosion Control Measures must be in place and maintained post construction to prevent overland drainage washout on areas that have been newly landscaped (especially beside/under stairs and slopes). The project should also consider the installation of fencing and informational signage around areas to discourage disturbance of the area by the public.
13. Site drainage must not be affected by this project. Any overland drainage issue or concern that is a result of this project will be corrected and repaired by the project/developer/contractor, not the City of Edmonton.
14. Please note that the disturbance areas will need to be weed free to pass the FAC inspection. Therefore, the contractor should ensure they have an adequate weed control plan in place and that it is adhered to throughout the entire warranty period.
15. Bank stabilization inspection of plant material requirements must be inspected by Parks to ensure plant material is viable and as per the drawing. Bank Stabilization methods should consider bioengineering and landscape naturalization methods suitable for site context and conditions.
16. Trail closures shall adhere to the City's Trail Closure Procedures. All trail closure activities must be approved through River Valley Operations prior to construction and closure of trails.
17. All damages to trails and paths must be restored to pre-existing trail surface type conditions and to COE Construction Standards and PARS acceptance.

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18. Any new trail construction or rehabilitation must meet current City of Edmonton trail construction standards and have a minimum 1M buffer zone, free of vegetation on either side of the trail.
19. All holes must be filled immediately to ensure public safety. This includes mitigating settlement that would create a future trip hazard.
20. A Public Tree Permit will be required for all work within 5 meters of a boulevard or open space tree and 10 meters from a natural stand, as per Public Tree Bylaw 18825. Prior to construction, all City of Edmonton trees within 5 meters of the construction area shall be protected in accordance with the Tree Preservation Guidelines, as well as to designate the trees outside the Access Activity area on City Lands. Please be advised that all costs associated with the removal, replacement or transplanting of trees shall be covered by the applicant as per the Corporate Tree Management Policy (C456C). The City of Edmonton will schedule and carry out all required tree work involved with this project.
21. Hard-surface access routes are preferred for large equipment.
22. Use of the area must be managed carefully to prevent any spills or release of contaminants.
23. There is no dumping or stockpiling on the site.
24. This project must not create any safety risk to the general public that has access to this site.
25. The site is left in an intended state that meets the City's satisfaction.

General Conditions:

1. All mitigation measures and commitments outlined by City reviewers must be incorporated into the construction work plan.
2. The proponent is responsible for seeking approval for any other regulatory permits from provincial and federal agencies.
3. For potential impacts to City parks and facilities:
    a. Hard surface access/haul routes are preferred.
    b. Please ensure restoration of the site occurs and meets existing site conditions. All damages to parkland must be restored to City of Edmonton Construction Standards and City Operations' satisfaction.
    c. Noxious weeds shall be managed and controlled as required within any fenced area and should be the responsibility of the contractor/department during construction.
    d. Signage must be posted indicating a project contact person and phone number for inquiries.
4. All trail closures shall adhere to the City's Trail Closure Procedures. All trail closure activities must be approved through River Valley Operations prior to construction and closure of trails. Please contact **Braeden Holmstrom** (Team Leader, River Valley & Horticulture) at **587-986-2841** to obtain the necessary trail closure approvals. This shall be done a minimum of two weeks in advance of planned construction.
5. Please attach this letter for any further City of Edmonton approvals.

Should you have any questions or concerns, please contact me by e-mail or by phone at 780-442-0695.

Regards,

Achyut Adhikari

URBAN PLANNING AND ECONOMY
PLANNING AND ENVIRONMENT SERVICES

City of Edmonton
7th Floor, 10111 - 104 Avenue NW
Edmonton, AB T5J 0J4

Email: sdrivervalleybylaw@edmonton.ca

December 1, 2021 Reference No. 407852315-001

To: Cyril Balitbit, City of Edmonton

From: Kyle Payne, Planning and Environment Services

Subject: KP21-60 Wellington Bridge Environmental Impact Assessment -Sign Off

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We have completed our review of KP21-60 Wellington Bridge Environmental Impact Assessment Project. This letter confirms that Administration has no further concerns with the proposed development under the North Saskatchewan River Valley Area Redevelopment Plan (NSRV ARP). Please adhere to the following conditions and advisements provided by reviewers.

Comments from Urban Growth and Open Space Strategy (Urban Planning and Environment):
We have reviewed the Wellington Bridge Renewal Environmental Impact Assessment Report and would like to provide our conditional support at this time. Please see our comments below for consideration once the project progresses to the next design stage.

- The EIA report has identified the key environmental issues and well described the biophysical characteristics of the project area. More specifically, the details were provided with wildlife design guideline reference to the proposed design and have considered potential assessments that fulfills the requirements of an EIA terms of reference.
- The EIA report was prepared with consideration of extended impacts that might overlap within the impact footprint of the proposed three separate concepts. Three preliminary designs were also developed to understand the high level impact and potential mitigation options. The outlined mitigation options in general sound reasonable for not but the EIA could explore in detail and verify the proposed measures at the time when the project team settled with one preferred option. Please consider revisiting the proposed mitigation options once the project picks one option with higher level of design consideration. This will provide further opportunity to identify particular mitigation options that could guide the future restoration plan more effectively.
- It was understood that the unnamed creek underneath the Wellington Bridge is currently directed through a corrugated steel pipe culvert. This project is exploring options to daylight this portion of the drainage pipe and integrate this channel with the broader stormwater management plan of the local area. We strongly support this concept and encourage the project team to engage our unit in future discussion.
- There are major erosion and stability concerns within the project area that may not be entirely within the scope of this project but this project could address general erosion issues through proper stormwater management plan. Successful integration of daylighting work will have a positive impact to improve ecological and hydrological connectivity through Ramsy Ravine.

Comments from Infrastructure Planning & Design (Engineering Services):
I reviewed the information provided for this file, including the Environmental Impact Assessment (EIA) prepared by Associated Engineering dated September 2021. Appended to the EIA was a geotechnical report prepared by Thurber Engineering Ltd. (Thurber), File 28874, dated February 04, 2021.

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Engineering Services - Geotechnical has been involved with this project, and continues to be involved, providing technical review, support and oversight to the design team. Engineering Services - Geotechnical reviewed the draft version of the appended Thurber report and the comments were incorporated into this final stamped report dated February 04, 2021. As such, we are confident that the geotechnical aspects of the project are being addressed satisfactorily throughout the project stages, and that any geotechnical issues that may arise will also be satisfactorily addressed through on-going support from the Geotechnical Engineer of Record (Thurber) for the project. As such, we have no issues with the project as presented.

Comments from Community and Recreation Facilities (River Valley Parks and Facilities):
Once construction dates have been determined please connect with Braeden Holmstrom to review trail/SUP closure requirements.

Comments from EPCOR Water and Sewer:
The Water and Sewer Servicing Section of EPCOR Water Services has reviewed the proposal and have the following comments:

Wellington Bridge
Our records indicate that no water and/or sewer services exist within the area of the proposal directly off EPCOR mains.

The owner/developer must conform to the requirements of the City of Edmonton Erosion and Sedimentation Control Guidelines and Field Manual.

If you have any questions about this reply, please contact this office at 780-496-5444, or e-mail us at wass.drainage@epcor.com.

Comments from Civic Events and Festivals:
There are 2 annual events that consistently use this roadway. One is the Edmonton Marathon, scheduled for Sunday, August 21, 2022. The second one is the High Street Mile which occurs in early May 2022 (date tbd). Please avoid construction work during these dates.

Comments from Partnership and Event Attraction Strategy:
No concerns or comments

Comments from Urban Forestry:

- Immediate tree conflicts exist within this project on either side of the Wellington Bridge. A site meeting with City of Edmonton Urban Forestry will be required prior to design approval. Please contact North Projects Forester Laurie Lacey with Urban Forestry at 780-868-2174 to schedule an on-site meeting as soon as possible, to review potential tree conflicts and take steps to avoid impacts.
- Please be advised that all costs associated with the removal, replacement or transplanting of trees shall be covered by the applicant as per the Corporate Tree Management Policy (C456C). Should removal or any landscape tree be required, the support of the surrounding community and the area forester is required as per City of Edmonton Live Tree Removal process.
- City of Edmonton Urban Forestry will schedule and carry out all required tree work involved with this project. If tree damage occurs, compensation or value will be enforced and shall be covered by the applicant as per the Corporate Tree Management Policy (C456C).

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- Prior to construction or lay-down area acceptance, all City of Edmonton trees within 5 meters of the proposed area shall be protected (hoarded) in such a way warranted by the City of Edmonton's Urban Forester. If tree damage occurs, compensation or value will be enforced and shall be covered by the proponent as per the Corporate Tree Management Policy (C456C).
- During construction or general use of lay-down area, no vehicles or equipment, construction supplies, or debris shall be placed within 5.0 metres of any tree or placed outside the designated fenced area. If construction equipment or material is found outside designated approval area, the proponent is to immediately remove or relocate items back into lay-down yard or costs or penalties will be issued under the Parkland by-law.
- Any soil damage or compaction compromising the trees root system within the parkland space, boulevard, or within the City's ROW buffer green space shall be corrected by and at a cost to the proponent/project. Please be advised that all costs associated with the soil remediation, watering of trees, removal, pruning, replacement, transplanting of trees and tree protection shall be covered by the proponent as per the Corporate Tree Management Policy (C456C).

Comments from EPCOR Drainage
Has EPCOR Drainage Planning and Engineering been consulted on the Drainage design? There are combined sewers in the area that we typically try not to add additional flows to so design would have to be looked at or a drainage analysis would have to be conducted to show that added flows to not have a negative impact on the system.

Comments from Parks and Roads Services (Natural Areas Operations):
- Please update the Corporate Tree Management Policy number to C456C.
- Please be aware that owl and raptor nesting season begins on February 15th and goes till April 15th. Disturbance should be minimized during this time and any vegetation removal will require a nest sweep be completed by a Professional Biologist.
- Please ensure all vegetation mitigation measures are adhered to throughout the length of the project. A Tree Preservation Plan will be required prior to construction and must be submitted when applying for a Tree Permit (the new Public Tree Bylaw will be enacted in spring of 2022). A Tree Removal Plan will need to be included in the preservation plan.
- All landscape plans should be circulated and reviewed prior to approval. Please consider the use of bio-engineering in this area for restoration along the slopes.
- Coordination with naturalareaoperations@edmonton.ca will be required to ensure our maintenance equipment can still use the trail.

General Conditions for vegetation removal:
1. Upon approval of the plan, a site meeting with Natural Areas will be required to review construction plans and tree protection. This meeting will need to be scheduled a minimum of four weeks in advance of the construction start date. This is to review access points, placement of all permanent or temporary construction material required for this project, and to determine tree protection requirements for construction within 5 meters of any City tree or 10 meters from a natural stand. For any vegetation removal, please ensure the area has been clearly staked. Note the laydown area fencing must be installed outside the dripline of any adjacent trees.
2. Please be advised that all costs associated with pruning, removal, tree damage, or replacement shall be covered by the Proponent as per the Corporate Tree Management Policy. Natural Areas will schedule and carry out all required tree work involved with this project. Please contact naturalareaoperations@edmonton.ca to arrange this meeting.

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3. Any soil damage or compaction compromising the tree's root system within the parkland space shall be corrected by and at a cost to the Proponent. Please be advised that all costs associated with soil remediation, watering, and tree protection shall be covered by the Proponent as per the Corporate Tree Management Policy.
4. Please note that the removal of vegetation has the opportunity to impact birds and bird habitat. Protection of migratory and non-migratory birds is legislated federally and provincially and enforceable regardless of whether or not individual environmental reviews conducted in accordance with the River Valley Bylaw include discussions of these topics. The onus is on the individual or company conducting habitat disturbance or construction activities to ensure that due diligence has been exercised to avoid harm to migratory and non-migratory birds. Individuals or companies that do not avoid harm to most wildlife species risk prosecution under the Wildlife Act and, in some cases, the Species at Risk Act. In the case of migratory birds, prosecution under the Migratory Birds Convention Act is also possible.

Comments from Parks and Roads Services (Resource Planning and Land Development):

1. A pre-construction inspection to areas that impact parkland prior to accessing the site and a post-construction inspection once parkland restoration has occurred will be conducted by Land Development. Email: parkslandscapeinventory@edmonton.ca to request inspections.
2. Project must be reviewed by Natural Areas Operations.
3. This project must follow all City Policies and Servicing Agreements.
4. The site is in compliance with the site's Natural Area Management Plan.
5. Impacts to vegetation may require biological surveys such as rare plant surveys, breeding bird surveys, etc. These surveys must be completed within the appropriate time frame and with consideration to seasonality and construction timelines.
6. Erosion and Sedimentation Control Measures must be in place prior to any construction activity to prevent any contaminants from entering Infrastructure or water bodies.
7. Any lay down, staging or haul route area on Parkland must be approved and fenced, with no vehicular or project activity outside of the fenced area. There should be no access to the lay down, staging or haul route area to ensure public safety. The restoration of the entire area must be repaired to the existing turf/natural conditions. Soil compaction protection, aeration and re-sodding; including the maintenance (eg watering, mowing and weed control) of restored areas will be the responsibility of the proponent until the area is established and accepted by PARS. Email: parkslandscapeinventory@edmonton.ca to request a laydown area approval site meeting.
8. All damaged maintained turf areas shall be re-sodded (not topdress and seed) and the maintenance (watering, mowing, public access control, etc) of all restored turf areas will be the responsibility of the proponent until the turf is established and accepted by PARS. There should be no access to the construction areas to ensure public safety.
9. All damages to natural areas must be repaired with approved natural grass seed mixtures and natural plantings/vegetation as per current Landscape Construction Standards and the maintenance (watering, weed control, public access control, etc) of restored natural areas will be the responsibility of the proponent until the natural area planting material is established. All other damages to parkland inventory must be restored to pre-existing conditions and COE Construction Standards and City Operations and PARS satisfaction.
10. The contractor is solely responsible for securing the site at all times. There should be no access to the construction, lay down, staging or haul route areas to ensure public safety.
11. Site drainage must not be affected by this project. Any overland drainage issue that is a result of this project will be corrected and repaired by the proponent/developer/contractor and to the final acceptance by PARS.
12. Erosion Control Measures must be in place post construction to prevent overland drainage washout on areas that have been newly landscaped (e.g. slopes, trails, etc).

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13. Public access control measures must be in place post construction to prevent the public from accessing areas that have been newly landscaped (e.g. slopes, trails, paths, sides of stairs, etc).
14. Any trail closures shall adhere to the City's Trail Closure Procedures. All trail closure activities must be approved through River Valley Operations prior to construction and closure of trails. This shall be done a minimum of two weeks in advance of planned construction.
15. Any new trail construction or rehabilitation must meet current City of Edmonton trail construction standards and should have a minimum 1M buffer zone, free of vegetation on either side of the trail.
16. There is no dumping or stockpiling on the site.
17. Use of this area must be managed carefully to prevent any spills or release of contaminants.
18. Any holes should be filled immediately to ensure public safety. This includes mitigating future trip hazards from settlement.
19. Noxious weed control shall be managed as required within any fenced or construction area in the scope of this project and will be the responsibility of the proponent during construction in accordance with the Weed Control Act.
20. The developer/contractor is responsible for all maintenance and weed control programs on this site and/or lay down, haul route areas during construction and until the entire site has been given final acceptance by PARS
21. If tree conflicts (work within 5m of a tree) are anticipated, or arise during construction, or a tree is within 3m of the haul route a site meeting with the City of Edmonton Natural Area Forester will be required. Please be advised that all costs associated with the removal, replacement or transplanting of trees shall be covered by the applicant as per the Corporate Tree Management Policy (C456C). The City of Edmonton will schedule and carry out all required tree work involved with this project.
22. Tree protection is required around existing boulevard trees near the site access points. A minimum 2M protection barrier surrounding each tree is required.
23. The site is left in an intended state that meets the City's satisfaction.
24. Please follow The City of Edmonton Landscape Design and Construction Standards Volume 5 – Landscaping when designing any new landscape for this area.
25. For projects longer than one day, signage must be posted indicating a project contact person and phone number for inquiries.

General Conditions:

1. All mitigation measures and commitments outlined by City reviewers must be incorporated into the construction work plan.
2. The proponent is responsible for seeking approval for any other regulatory permits from provincial and federal agencies.
3. Please contact the Neighbourhood Resource Coordinator Darrell Bordell at 780-944-5424) in the area to ensure appropriate community notification.
4. For potential impacts to City parks and facilities:
    a. Hard surface access/haul routes are preferred.
    b. Please ensure restoration of the site occurs and meets existing site conditions. All damages to parkland must be restored to City of Edmonton Construction Standards and City Operations' satisfaction.
    c. Noxious weeds shall be managed and controlled as required within any fenced area and should be the responsibility of the contractor/department during construction.
    d. Signage must be posted indicating a project contact person and phone number for inquiries.

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Email: sdrivervalleybylaw@edmonton.ca

5. All trail closures shall adhere to the City's Trail Closure Procedures. All trail closure activities must be approved through River Valley Operations prior to construction and closure of trails. Please contact **Braeden Holmstrom** (Team Leader, River Valley & Horticulture) at **587-986-2841or braeden.holmstrom@edmonton.ca** to obtain the necessary trail closure approvals. This shall be done a minimum of two weeks in advance of planned construction.
6. Please attach this letter for any further City of Edmonton approvals.

Should you have any questions or concerns, please contact me by e-mail or by phone at 780-496-6397.

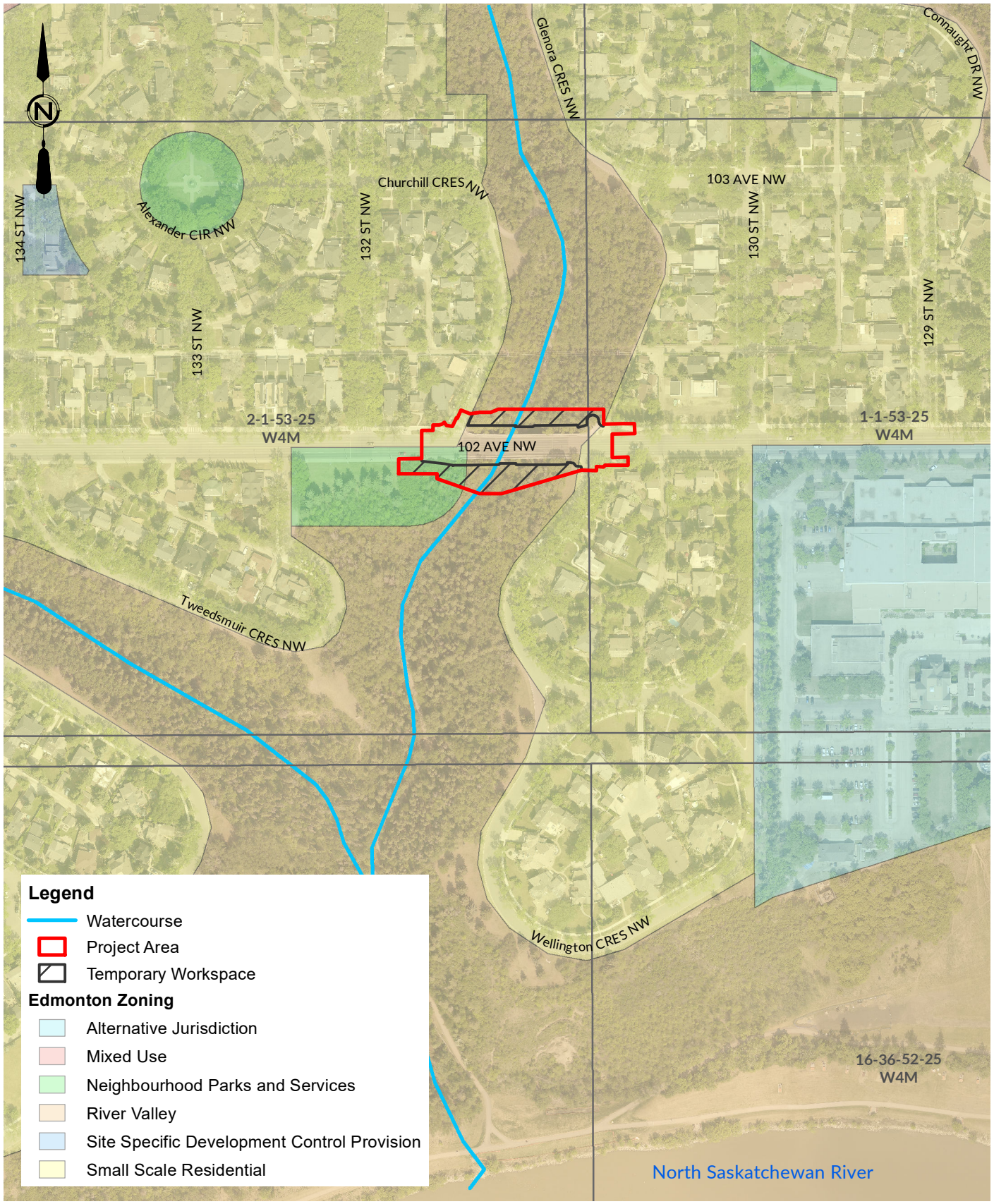
Regards,

Kyle Payne

APPENDIX B – UPDATED FIGURES

IF NOT 25 mm ADJUST SCALES
25 mm

SCALE(S) SHOWN ARE INTENDED FOR LETTER (8.5x11) SIZE DRAWINGS UNLESS NOTED OTHERWISE



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DRAWING PATH: D:\2020-3858_ela\EIA_Report\fig1-1_ProjectOverviewZoning.mxd
DATA SOURCE: :

Associated Engineering

BEST MANAGED COMPANIES
CANADA
Platinum member

AE PROJECT No.	2020-3858
SCALE	1:3,500
APPROVED	
DATE	2024MAY15
REV	
DESCRIPTION	ISSUED FOR REPORT

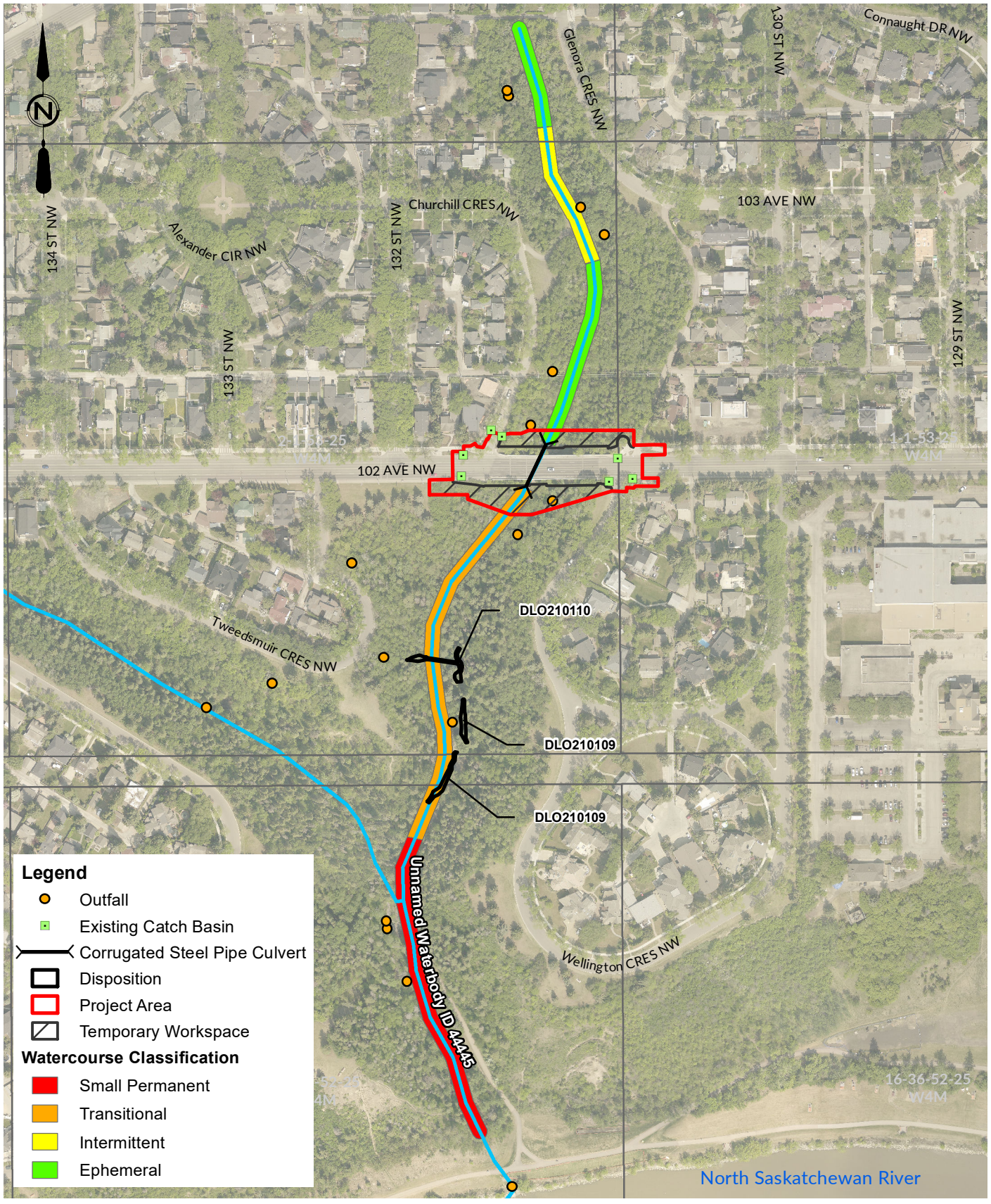
FIGURE 1

CITY OF EDMONTON
WELLINGTON BRIDGE REPLACEMENT

PROJECT OVERVIEW AND ZONING

IF NOT 25 mm ADJUST SCALES
25 mm

SCALE(S) SHOWN ARE INTENDED FOR LETTER (8.5x11) SIZE DRAWINGS UNLESS NOTED OTHERWISE



SAVE DATE: 2024-05-14 9:00:17 AM SAVED BY:
DRAWING PATH: D:\2020-3858_ala\EIA_Report\fig3-2_SurfaceWater.mxd
DATA SOURCE: :

Associated Engineering

BEST MANAGED COMPANIES Platinum member

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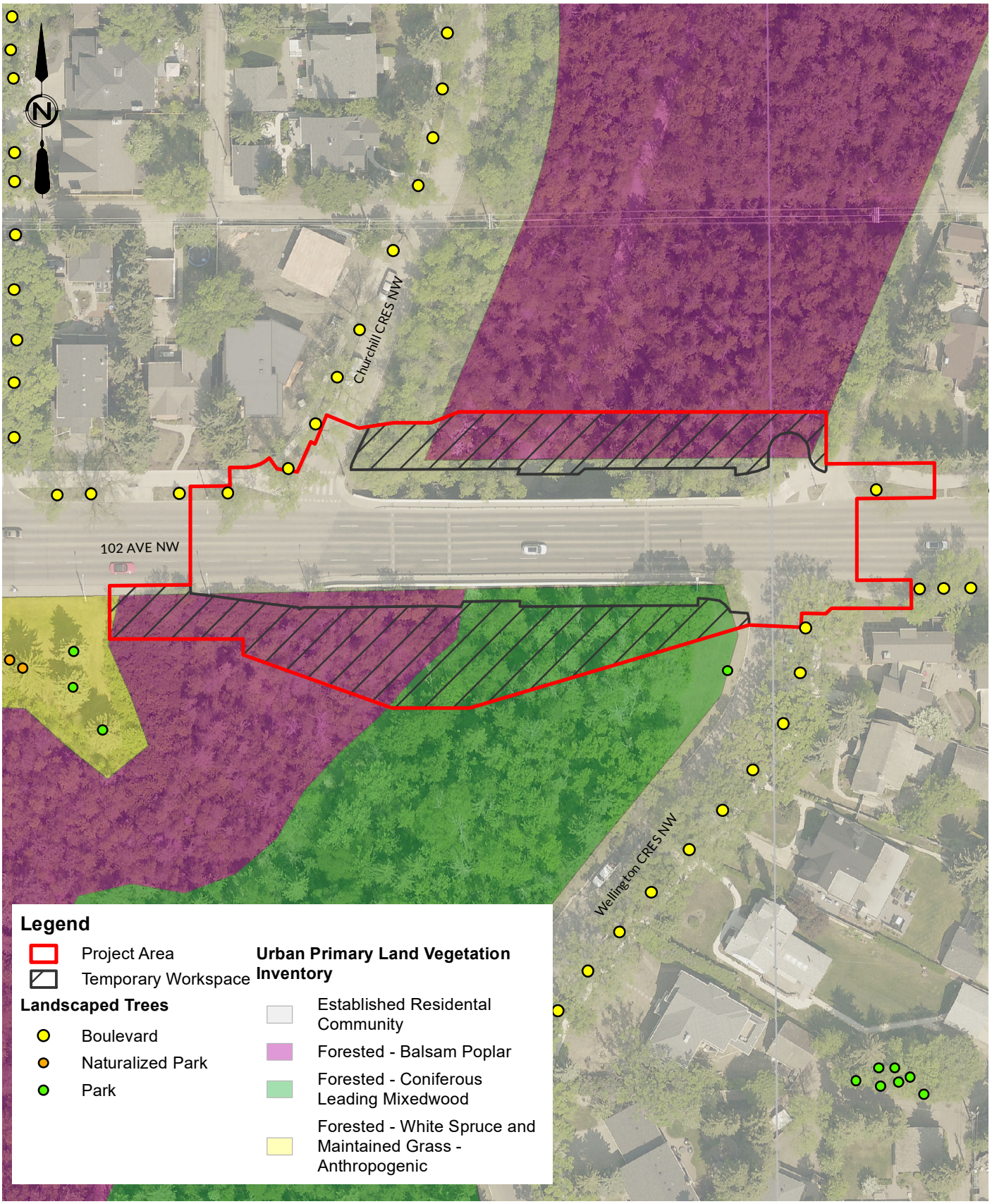
AE PROJECT No.	2020-3858
SCALE	1:3,500
APPROVED	
DATE	2024MAY15
REV	
DESCRIPTION	ISSUED FOR REPORT

FIGURE 2

CITY OF EDMONTON
WELLINGTON BRIDGE REPLACEMENT

SURFACE WATER

IF NOT 25 mm ADJUST SCALES
25 mm
SCALE(S) SHOWN ARE INTENDED FOR LETTER (8.5x11) SIZE DRAWINGS UNLESS NOTED OTHERWISE



SAVE DATE: 2024-05-14 9:03:36 AM SAVED BY:
DRAWING PATH: D:\2020-3858_ela\EIA_Report\fig3-4_Vegetation.mxd
DATA SOURCE: ;

Associated Engineering

BEST MANAGED COMPANIES Platinum member

0 10 20 30 40 Meters

AE PROJECT No.	2020-3858
SCALE	1:1,000
APPROVED	
DATE	2024MAY15
REV	
DESCRIPTION	ISSUED FOR REPORT

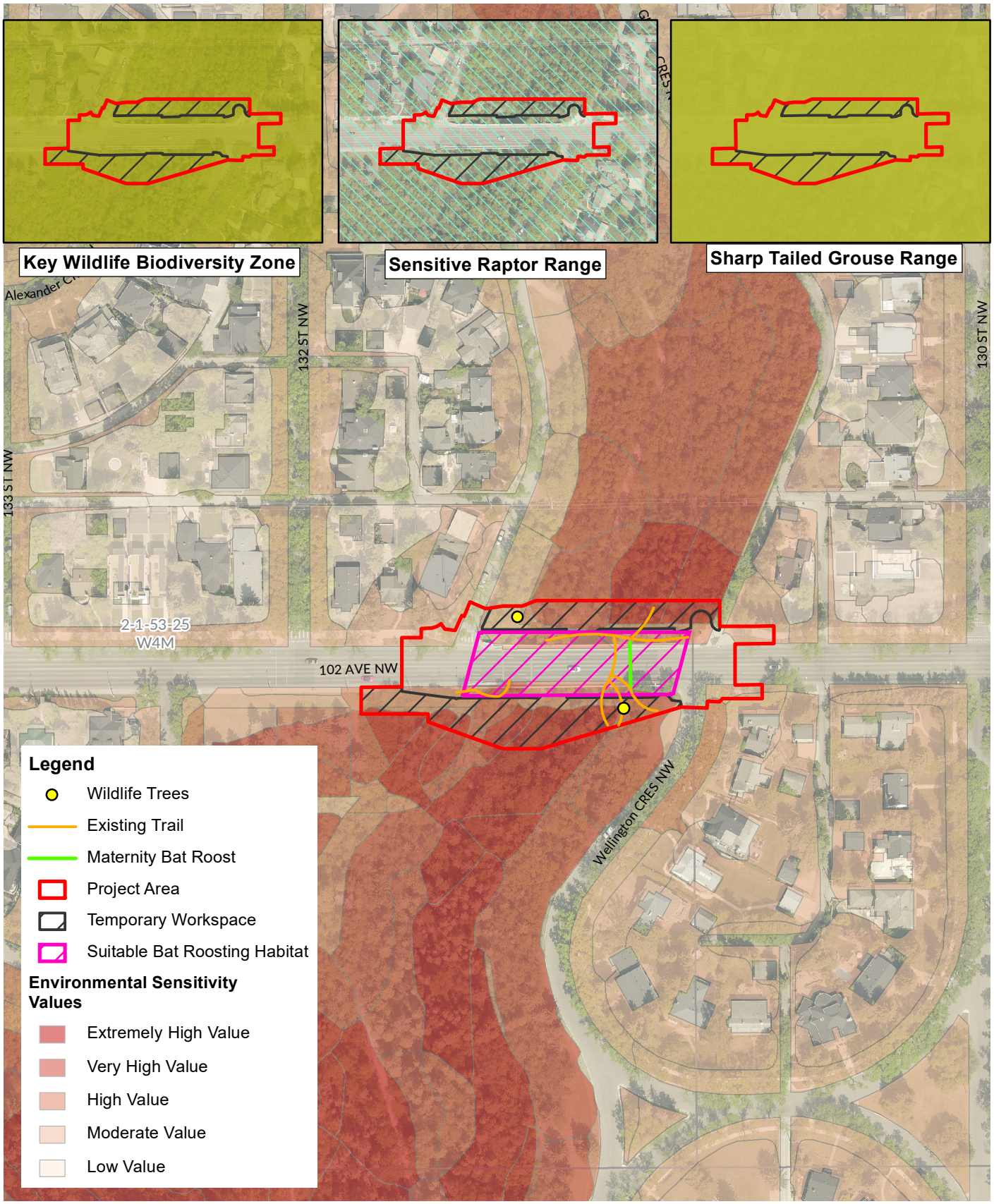
FIGURE 3

CITY OF EDMONTON
WELLINGTON BRIDGE REPLACEMENT

VEGETATION

IF NOT 25 mm ADJUST SCALES
25 mm

SCALE(S) SHOWN ARE INTENDED FOR LETTER (8.5x11) SIZE DRAWINGS UNLESS NOTED OTHERWISE



SAVE DATE: 2024-05-15 9:07:00 AM SAVED BY:
DRAWING PATH: D:\2020-3858_ale\EIA_Report\fig3-5_Wildlife.mxd
DATA SOURCE: :

Associated Engineering

BEST MANAGED COMPANIES Platinum member

Meters
0 20 40 60 80

AE PROJECT No.	2020-3858
SCALE	1:2,000
APPROVED	
DATE	2024MAY15
REV	
DESCRIPTION	ISSUED FOR REPORT

FIGURE 4

CITY OF EDMONTON
WELLINGTON BRIDGE REPLACEMENT

WILDLIFE

Achyut Adhikari

APPENDIX C – HAZARDOUS BUILDING MATERIALS TESTING REPORT

WWW.THURBER.CA

THURBER ENGINEERING LTD.

Hazardous Building Material Testing

Wellington Bridge Replacement Project
102 Avenue East of 132 Street NW
Edmonton, Alberta

Client Name: Associated Engineering Alberta Ltd.
Date: April 16, 2024
File: 28874.220

4127 Roper Road, Edmonton, Alberta T6B 3S5 | Phone: (780) 438-1460

THURBER ENGINEERING LTD.

TABLE OF CONTENTS

APPENDICES

THURBER ENGINEERING LTD.

1. INTRODUCTION

Thurber Engineering Ltd. (Thurber) was retained by Associated Engineering Alberta Ltd. (AEAL) to conduct Hazardous Building Material Testing (HBMT) on the Wellington Bridge along 102 Avenue, east of 132 Street NW in Edmonton, Alberta (the "Site"). The Site does not have a municipal address but consists of a four lane concrete bridge that carries 102 Avenue traffic across the Ramsay Ravine. The Site is shown on Drawing 39888-1 in Appendix A.

Authorization to proceed with the HBMT was provided by Mr. Chris Prya, P.Eng., MBA, of AEAL.

It is a condition of this report that Thurber's performance of its professional services is subject to the attached Statement of Limitations and Conditions.

2. SCOPE OF WORK

The general scope of work for the supplemental HBMT is outlined in Thurber's March 13, 2024, proposal. The scope of work for the supplemental HBMT generally consisted of:

- Mobilize Thurber personnel to the Site.
- Obtain and submit samples of selected building materials for asbestos and lead paint analyses.
- Observe fluorescent light ballasts and structure features for the identification of potential sources of polychlorinated biphenyls (PCBs), mercury, chlorofluorocarbons (CFCs) and radioactive materials.
- Compare results to provincial or federal guidelines.
- Prepare a report.

The number of samples was to be dependent on the features found on Site.

3. HAZARDOUS BUILDING MATERIAL TESTING

On April 2, 2024, Mr. Michael Halliwell, P.Eng., of Thurber, conducted the HBMT at the Site. The HBMT included collection of representative paint and building materials samples for subsequent lead paint and bulk asbestos analyses. The sample locations included full depth paint samples at location of visible paints and materials that commonly contain asbestos.

A total of 14 samples, including seven for lead paint and seven potential asbestos containing materials (such as concrete and caulking), plus two duplicates, were collected. Samples were placed into laboratory supplied plastic bags and stored in a cooler for delivery to Eurofins Enviro-Works (Eurofins) for chemical analyses.

Structure features were observed; however, no fluorescent lighting, high-intensity discharge lamps, HVAC systems, piping or other potential sources of PCBs, CFCs, mercury or radioactive materials were present.

4. GUIDELINES / ASSESSMENT SOURCES

The guidelines and assessment sources used to evaluate samples from Site are outlined below:

- Government of Canada, 2016 (as amended). “Surface Coating Materials Regulation” (SCMR, for lead paint assessment).
- Government of Alberta, 2019. “Alberta Asbestos Abatement Manual” (AAAM, for asbestos assessment).

5. ANALYTICAL RESULTS

5.1 Lead

Based on the Eurofins lead test results, as presented in Table 5.1 in Appendix B, all paint samples met the SCMR guideline (90 mg/kg). In general, the paint observed on the bridge was quite weathered, with the paint on bridge deck areas fairly well adhered and in overall fair condition. Areas along the paved trail below the bridge have been repeatedly graffitied and painted over, resulting in very thick coatings of weathered, poorly adhered paint (generally poor condition). Details of Eurofins lead paint analyses are included in Appendix B.

5.2 Asbestos

The Eurofins asbestos analyses, as summarized in Table 5.1, identified no detectable asbestos in any of the samples submitted. The analytical results and date of bridge construction (1932 is stamped into the west abutment), suggests that the bridge was installed after the period of widespread historical use of asbestos concrete, but prior to common use in other construction products. Details of Eurofins asbestos analyses are included in Appendix B.

5.3 PCBs, Mercury, CFCs and Radioactive Materials

Visual observations during the HBMT did not identify transformers, lamps with ballasts, fluorescent light tubes, batteries, smoke detectors or other features on Site that would be potential sources of PCBs, mercury, CFCs or radioactive materials.

6. CONCLUSIONS

Sampling of the bridge structure and visible paint did not identify asbestos or lead paint at the Wellington Bridge. Common sources of PCBs, mercury, CFCs and radioactive materials were not observed on Site at the time of the HBMT sampling. Additional HBMT sampling is not warranted at this time.

However, proper precautions should be in place to protect workers from other potential hazards that may be encountered during the project (i.e. silica) and if suspect materials are encountered within the structure during bridge deconstruction (i.e. hidden cementitious conduit materials), they should be tested to confirm their status.

THURBER ENGINEERING LTD.

7. CLOSURE

We trust this information meets your present needs. If you have any questions, please contact the undersigned at your convenience.

Michael Halliwell, M.Eng., EP, P. Eng.
Senior Environmental Engineer

Date: April 16, 2024
File: 28874.220

Craig Campbell, M.Eng., P. Eng.
Review Partner

THURBER

STATEMENT OF LIMITATIONS AND CONDITIONS

1. STANDARD OF CARE

This Report has been prepared in accordance with generally accepted engineering or environmental consulting practices in the applicable jurisdiction. No other warranty, expressed or implied, is intended or made.

2. COMPLETE REPORT

All documents, records, data and files, whether electronic or otherwise, generated as part of this assignment are a part of the Report, which is of a summary nature and is not intended to stand alone without reference to the instructions given to Thurber by the Client, communications between Thurber and the Client, and any other reports, proposals or documents prepared by Thurber for the Client relative to the specific site described herein, all of which together constitute the Report.

IN ORDER TO PROPERLY UNDERSTAND THE SUGGESTIONS, RECOMMENDATIONS AND OPINIONS EXPRESSED HEREIN, REFERENCE MUST BE MADE TO THE WHOLE OF THE REPORT. THURBER IS NOT RESPONSIBLE FOR USE BY ANY PARTY OF PORTIONS OF THE REPORT WITHOUT REFERENCE TO THE WHOLE REPORT.

3. BASIS OF REPORT

The Report has been prepared for the specific site, development, design objectives and purposes that were described to Thurber by the Client. The applicability and reliability of any of the findings, recommendations, suggestions, or opinions expressed in the Report, subject to the limitations provided herein, are only valid to the extent that the Report expressly addresses proposed development, design objectives and purposes, and then only to the extent that there has been no material alteration to or variation from any of the said descriptions provided to Thurber, unless Thurber is specifically requested by the Client to review and revise the Report in light of such alteration or variation.

4. USE OF THE REPORT

The information and opinions expressed in the Report, or any document forming part of the Report, are for the sole benefit of the Client. NO OTHER PARTY MAY USE OR RELY UPON THE REPORT OR ANY PORTION THEREOF WITHOUT THURBER'S WRITTEN CONSENT AND SUCH USE SHALL BE ON SUCH TERMS AND CONDITIONS AS THURBER MAY EXPRESSLY APPROVE. Ownership in and copyright for the contents of the Report belong to Thurber. Any use which a third party makes of the Report, is the sole responsibility of such third party. Thurber accepts no responsibility whatsoever for damages suffered by any third party resulting from use of the Report without Thurber's express written permission.

5. INTERPRETATION OF THE REPORT

a) Nature and Exactness of Soil and Contaminant Description: Classification and identification of soils, rocks, geological units, contaminant materials and quantities have been based on investigations performed in accordance with the standards set out in Paragraph 1. Classification and identification of these factors are judgmental in nature. Comprehensive sampling and testing programs implemented with the appropriate equipment by experienced personnel may fail to locate some conditions. All investigations utilizing the standards of Paragraph 1 will involve an inherent risk that some conditions will not be detected and all documents or records summarizing such investigations will be based on assumptions of what exists between the actual points sampled. Actual conditions may vary significantly between the points investigated and the Client and all other persons making use of such documents or records with our express written consent should be aware of this risk and the Report is delivered subject to the express condition that such risk is accepted by the Client and such other persons. Some conditions are subject to change over time and those making use of the Report should be aware of this possibility and understand that the Report only presents the conditions at the sampled points at the time of sampling. If special concerns exist, or the Client has special considerations or requirements, the Client should disclose them so that additional or special investigations may be undertaken which would not otherwise be within the scope of investigations made for the purposes of the Report.

b) Reliance on Provided Information: The evaluation and conclusions contained in the Report have been prepared on the basis of conditions in evidence at the time of site inspections and on the basis of information provided to Thurber. Thurber has relied in good faith upon representations, information and instructions provided by the Client and others concerning the site. Accordingly, Thurber does not accept responsibility for any deficiency, misstatement or inaccuracy contained in the Report as a result of misstatements, omissions, misrepresentations, or fraudulent acts of the Client or other persons providing information relied on by Thurber. Thurber is entitled to rely on such representations, information and instructions and is not required to carry out investigations to determine the truth or accuracy of such representations, information and instructions.

c) Design Services: The Report may form part of design and construction documents for information purposes even though it may have been issued prior to final design being completed. Thurber should be retained to review final design, project plans and related documents prior to construction to confirm that they are consistent with the intent of the Report. Any differences that may exist between the Report's recommendations and the final design detailed in the contract documents should be reported to Thurber immediately so that Thurber can address potential conflicts.

d) Construction Services: During construction Thurber should be retained to provide field reviews. Field reviews consist of performing sufficient and timely observations of encountered conditions in order to confirm and document that the site conditions do not materially differ from those interpreted conditions considered in the preparation of the report. Adequate field reviews are necessary for Thurber to provide letters of assurance, in accordance with the requirements of many regulatory authorities.

6. RELEASE OF POLLUTANTS OR HAZARDOUS SUBSTANCES

Geotechnical engineering and environmental consulting projects often have the potential to encounter pollutants or hazardous substances and the potential to cause the escape, release or dispersal of those substances. Thurber shall have no liability to the Client under any circumstances, for the escape, release or dispersal of pollutants or hazardous substances, unless such pollutants or hazardous substances have been specifically and accurately identified to Thurber by the Client prior to the commencement of Thurber's professional services.

7. INDEPENDENT JUDGEMENTS OF CLIENT

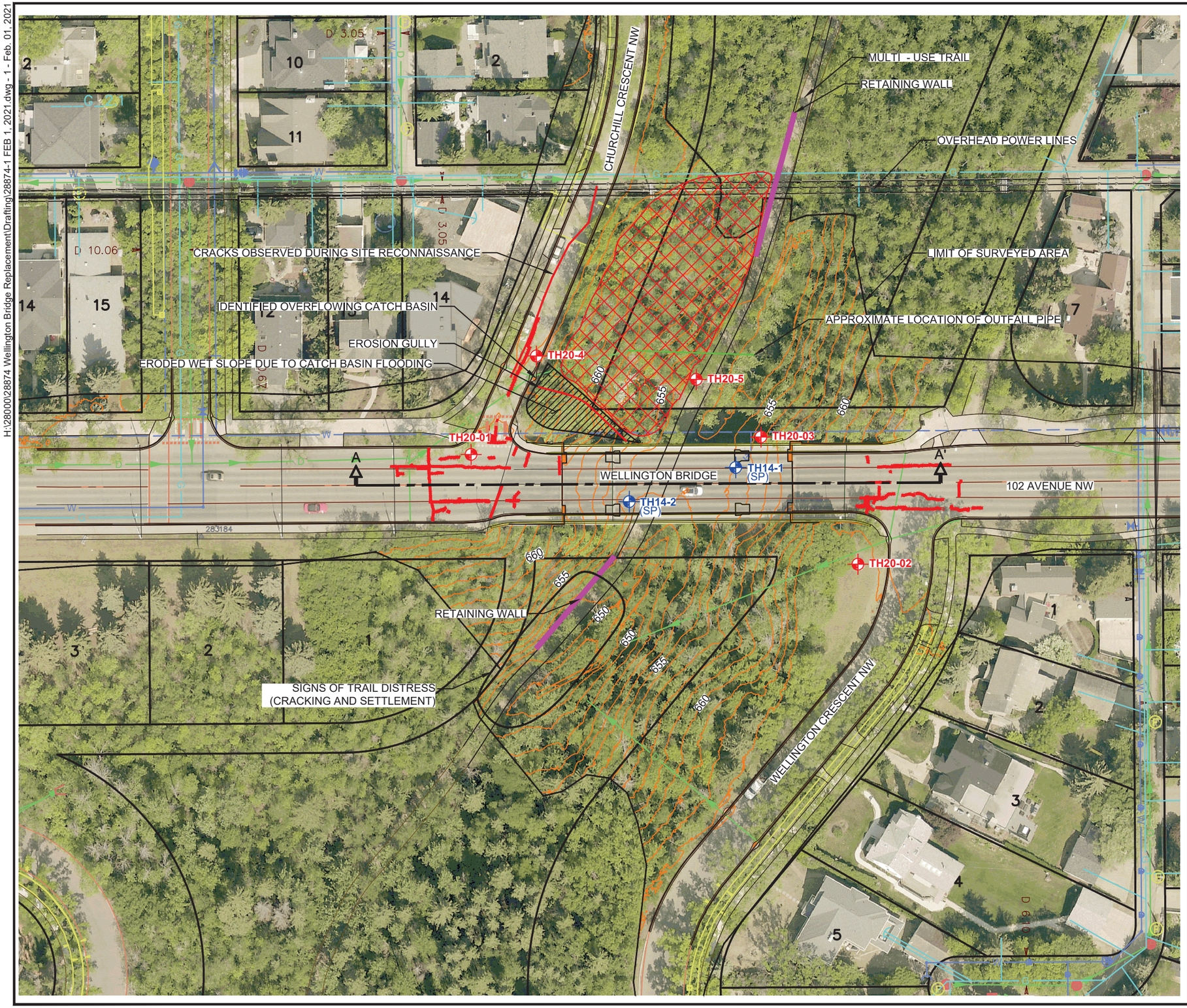
The information, interpretations and conclusions in the Report are based on Thurber's interpretation of conditions revealed through limited investigation conducted within a defined scope of services. Thurber does not accept responsibility for independent conclusions, interpretations, interpolations and/or decisions of the Client, or others who may come into possession of the Report, or any part thereof, which may be based on information contained in the Report. This restriction of liability includes but is not limited to decisions made to develop, purchase or sell land.

THURBER ENGINEERING LTD.

APPENDIX A

Drawing

H:\28000\28874 Wellington Bridge Replacement\Drafting\28874-1 FEB 1, 2021.dwg - 1 - Feb. 01, 2021



N
W E
S

LEGEND

- APPROXIMATE TEST HOLE LOCATION (2020)
- APPROXIMATE TEST HOLE LOCATION (2014)
- (SP) STANDPIPE PIEZOMETER
- CRACK
- GROUND SURFACE CONTOUR (CONTOUR INTERVAL = 1m)
- OVERHEAD POWER LINE
- LANDSLIDES IN ADVANCE STAGE: CRACKS AND SLIDE SURFACE DEVELOPED. LANDSLIDES ARE IN DORMANT OR SLOW MOVEMENT CONDITION. POTENTIALLY ACTIVE LANDSLIDES.

0 10 20 30 40 50m

SCALE 1:800

2019 AIR PHOTO FROM THE CITY OF EDMONTON

Associated Engineering

WELLINGTON BRIDGE REPLACEMENT

SITE PLAN SHOWING APPROXIMATE TEST HOLE LOCATIONS

DWG No. 28874-1

DRAWN BY	ML
DESIGNED BY	SEC
APPROVED BY	TSA
SCALE	1:800
DATE	FEBRUARY 2021
FILE No.	28874

THURBER ENGINEERING LTD.

THURBER ENGINEERING LTD.

APPENDIX B

Table 5.1

HBMT Chemical Analyses

TABLE 5.1 - Wellington Bridge HBMT Results

102 Avenue East of 132 Street NW, Edmonton, Alberta

Sample Date: 02 April 2024
Job #: 28874
Sampled By: MFH

Sample No.	Location	Description	Area / Quantity	Ease of Sampling, Status, Friability	Photo?	Lead (Guideline 90 mg/kg)	Asbestos
1	E. Abutment	Grafitti and covering paint	~75 m^2	Weathered, thick (many layers), cracking, easy to sample		<21.1	
2	NE Pier	Grafitti and covering paint	~40 m^2	Weathered, thick (many layers), cracking, easy to sample		<21.0	
3	NW Pier	Grafitti and covering paint	~40 m^2	Weathered, thick (many layers), cracking, easy to sample		<23.5	
4	W Abutment	Grafitti and covering paint	~75 m^2	Weathered, thick (many layers), cracking, easy to sample		<23.1	
5	SE Pier	Grafitti and covering paint	~40 m^2	Weathered, thick (many layers), cracking, easy to sample		<22.2	
6 & Dup 1	SW Pier	Grafitti and covering paint	~40 m^2	Weathered, thick (many layers), cracking, easy to sample		<23.3 / <22.87	
7	W. Abutment	Concrete material (typical)	Entire structure	Variable condition, some area quite weathered / degraded, no-friable			N.D.
8	SW Pier	Concrete material (typical)	Entire structure	Variable condition, some area quite weathered / degraded, non-friable			N.D.
9	Main Deck	Light brown / cream colored paint (typical)	All painted areas of deck	Weathered, cracking in places, generally well adhered.		<22.8	
10	Main Deck	Concrete material (typical, sample from north side)	Main deck	Generally good condition, non-friable			N.D.
11 / Dup 2	Main Deck	Caulking between joints (i.e. on "handrail")	Limited quantity	Weathered, generally good condition, non-friable			N.D. / N.D.
12	Main Deck	Baulstrade material	Portions of both sides of main deck	Generally good condition, non-friable			N.D.
13	Main Deck	Concrete "footer" at NW corner (typical of newer concrete added at abutments)	Limited quantity	Variable condition, some area quite weathered / degraded, non-friable			N.D.
14	Main Deck	Second concrete material sample (south side)	Main deck	Generally good condition, non-friable	---		N.D.

N.D. - None Detected

eurofins | Enviro-Works

18949 111 Avenue NW
Edmonton, Alberta T5S 2X4
Phone: 780-457-4652
email: info@enviro-works.com
web: www.enviro-works.com

Certificate of Analysis

Client: Thurber Engineering Ltd.
4127 Roper Road NW
Edmonton, AB T6B 3S5

Date Submitted: 4/2/2024
Date Completed: 4/5/2024

Lab ID: 24040270
COC No.: 128903
Project: 28874
Contact: Michael Halliwell
Analyst: cpotolicki

Method: ASTM E1645-16 (prep) and ASTM E3193-20 (analysis) - Lead Paint by FAAS

Sample ID	Date Sampled	Description	Lead (mg/kg)	Qualifier
24040270-001	4/2/2024	Sample 1	< 21.1	
24040270-002	4/2/2024	Sample 2	< 21.0	
24040270-003	4/2/2024	Sample 3	< 23.5	
24040270-004	4/2/2024	Sample 4	< 23.1	
24040270-005	4/2/2024	Sample 5	< 22.2	
24040270-006	4/2/2024	Sample 6	< 23.3	
24040270-007	4/2/2024	Sample 9	< 22.8	
24040270-008	4/2/2024	Dup 1	< 22.7	

Eurofins Enviro-Works Inc. is a proficient member of the AIHA ELPAT quality control program. Samples will be stored for 60 days after they are submitted. Eurofins Enviro-Works Inc. is not responsible for the procedures used during sample collection. Eurofins Enviro-Works Inc. is not responsible for any consultation, interpretation or course of action taken with respect to these results. Eurofins Enviro-Works Inc. privacy policy includes the limitation of access or discussion of these results to include only the client listed in the report.

ilac-MRA CALA Testing Accreditation No. A3166

Approved By:

Ann-Marie Kalman, B.Sc.
Lab Manager

eurofins | Enviro-Works

18949 111 Avenue NW
Edmonton, Alberta, T5S 2X4
Ph: 780-457-4652
Email: info@enviro-works.com
Web: www.enviro-works.com

Certificate of Analysis

Client: Thurber Engineering Ltd.
4127 Roper Road NW
Edmonton, AB T6B 3S5
Date Submitted: 02-Apr-24
Date Completed: 11-Apr-24

Lab ID : 24040269
COC No. 128903
Project: 28874
Contact: Michael Halliwell

Bulk Asbestos Fiber Analysis by Polarized Light Microscopy (PLM) NIOSH 9002

Sample No.	Date Sampled	Client Sample Description	Sample Type	Asbestos Type and Content	Non-Asbestos Constituents
24040269-001	2024-04-02	Sample 7	Cementitious Mix, Grey/Brown	None Detected	Other
24040269-002	2024-04-02	Sample 8	Cementitious Mix, Grey/Brown	None Detected	Other
24040269-003	2024-04-02	Sample 10	Cementitious Mix, White	None Detected	Other
24040269-004	2024-04-02	Sample 11	Putty, Grey/Brown	None Detected	Other
24040269-005	2024-04-02	Sample 12	Cementitious Mix, Grey	None Detected	Other
24040269-006	2024-04-02	Sample 13	Cementitious Mix, Grey	None Detected	Other
24040269-007	2024-04-02	Sample 14	Cementitious Mix, Grey/Brown	None Detected	Other
24040269-008	2024-04-02	Dup 2	Putty, Grey/Brown	None Detected	Other

* = Trace amounts detected; Below replicable detection limit

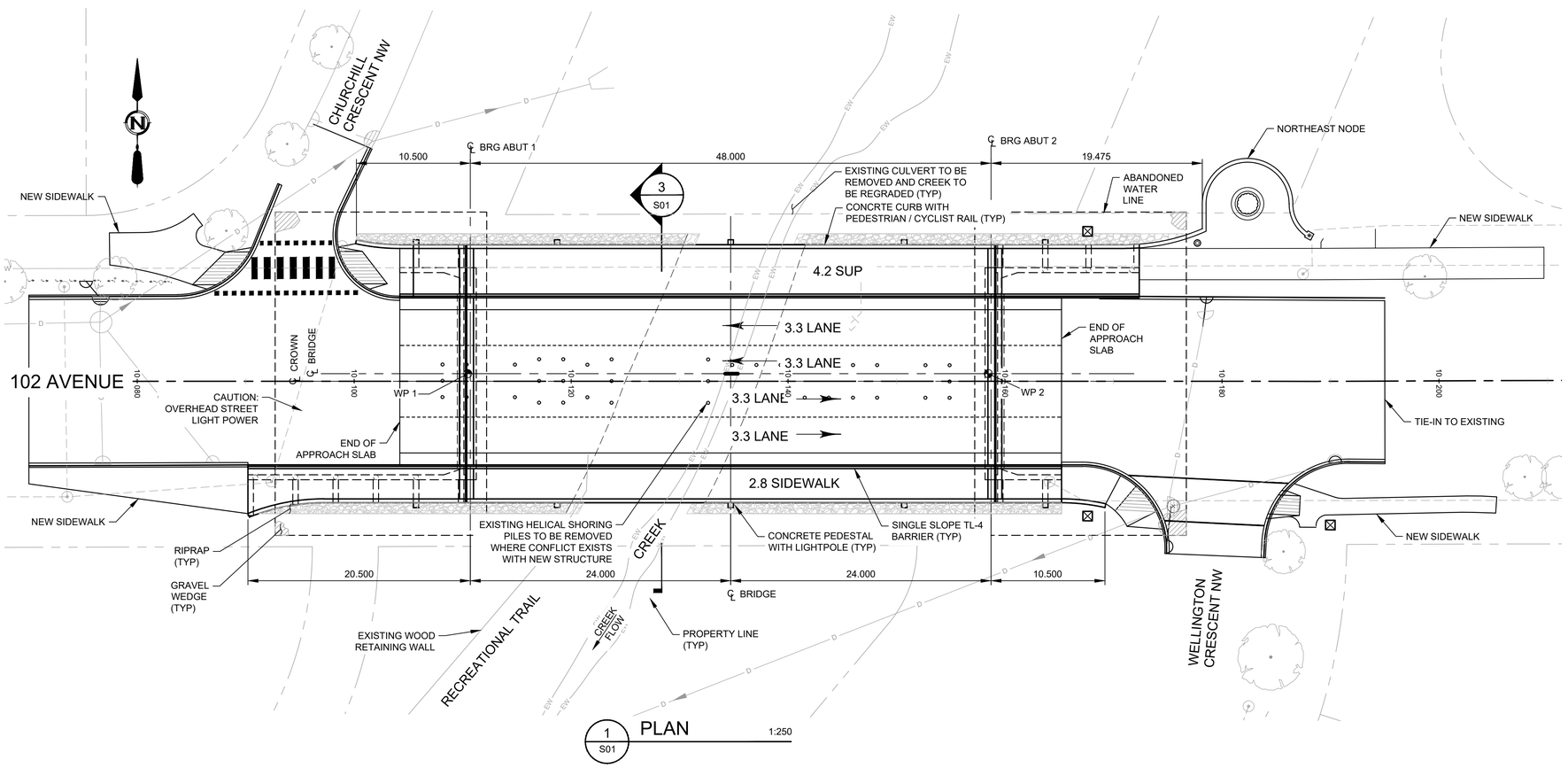
Eurofins Enviro-Works Inc. is accredited by CALA to ISO/IEC 17025. For scope of accreditation visit www.enviro-works.com. Samples will be stored for 60 days after they are submitted. This analytical report reflects only the results of the materials tested. Eurofins Enviro-Works Inc. is not responsible for the procedures used during sample collection. Eurofins Enviro-Works Inc. is not responsible for any consultation, interpretation or course of action taken with respect to these results. Please be aware that TEM is recommended for any cementitious material, and/or vermiculite matrix that are determined after analysis to be non-detected, as trace amounts of asbestos may be below the resolution of a PLM. Eurofins Enviro-Works Inc. privacy policy includes the limitation of access or discussion of these results to include only the client listed in the report.

ilac-MRA CALA Testing Accreditation No. A3166

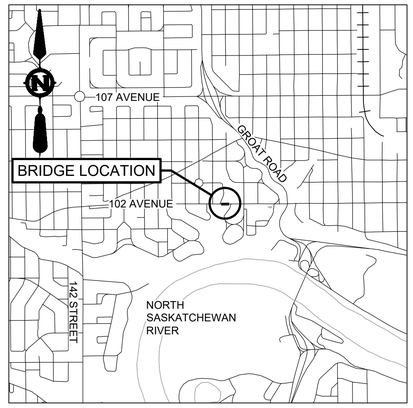
Approved By:

Ann-Marie Kalman, B.Sc.
Lab Manager

APPENDIX D – PRELIMINARY DESIGN DRAWINGS



1 S01 PLAN 1:250



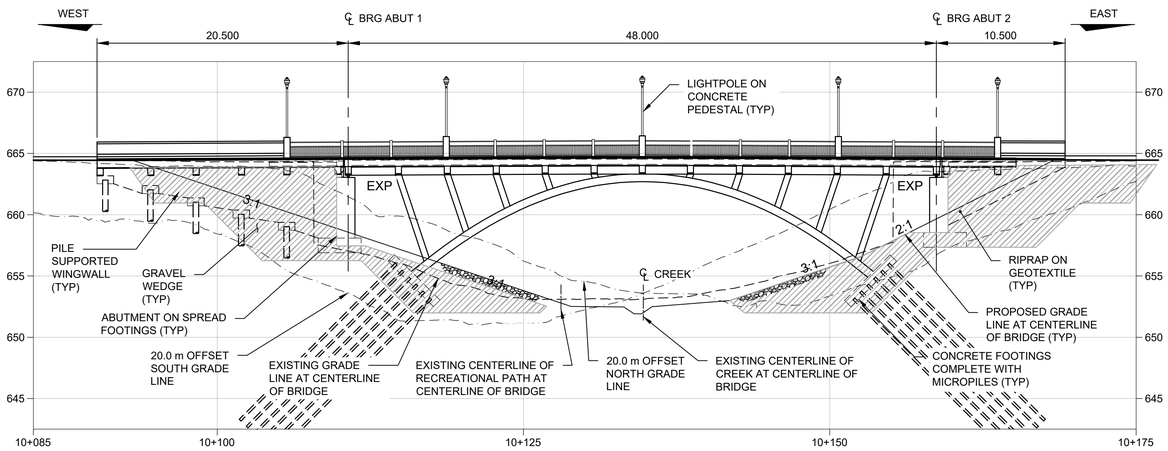
4 S01 PLAN 1:25000
SITE MAP

NOTES

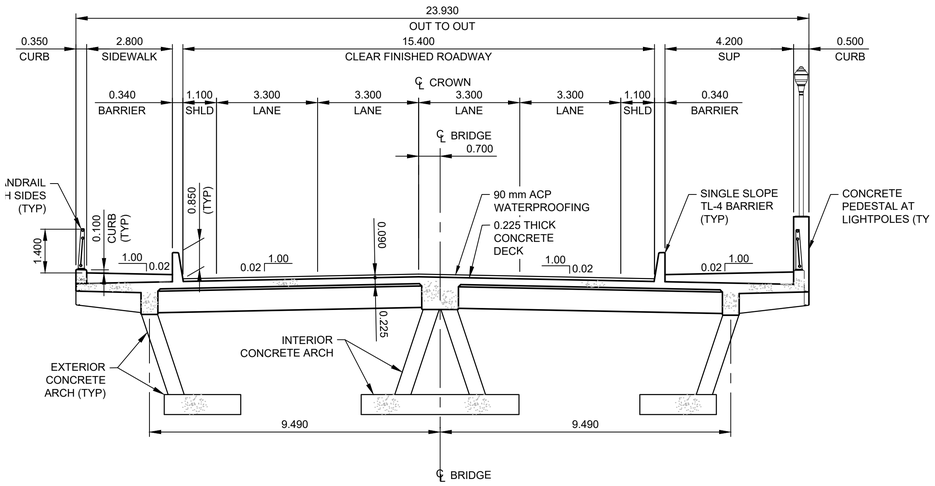
1. ALL DIMENSIONS ARE GIVEN IN MILLIMETERS UNLESS NOTED OTHERWISE

SURFACE UTILITY LEGEND

TROLLEY POLES	TELEPHONE MANHOLE
WOODEN POWER POLE	TELEPHONE POLE
POWER POLE	DRAINAGE MANHOLE (SANITARY)
POWER POLE (SURVEYED)	DRAINAGE MANHOLE (STORM)
STREET LIGHT POLE	CATCH BASIN MANHOLE
STREET LIGHT POLE (SURVEYED)	CATCH BASIN
POWER MANHOLE	FIRE HYDRANT
POLE ANCHOR	FIRE HYDRANT (SURVEYED)
TRAFFIC POLE	WATER VALVE
TRAFFIC POLE (SURVEYED)	WATER TEE
TRAFFIC CABINET	ANODE
NEW LIGHTPOLE	ROADWAY SIGN



2 S01 ELEVATION 1:250



3 S01 SECTION 1:250

NO.	REVISIONS	BY	DATE	APP'D
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5				
4				
3				
2				
1	ISSUED FOR DRAFT PRELIMINARY	JG	16APR2024	TA

NO.	ISSUE	BY	DATE
4			
3			
2	AS BUILT / TO GIRS		
1	TENDER AWARD DATE		

PROGRAM NO.

CONTRACT NO.

CONSTRUCTION RETURN

CONTRACTOR

SURVEYOR

DATE

FILE NUMBER

CONSTRUCTION ENGINEER DATE

GENERAL SUPERVISOR DATE

DESIGN CONSULTANT

Associated Engineering

PRELIMINARY/ FOR DISCUSSION NOT FOR CONSTRUCTION

APPROVED FOR CONSTRUCTION

DATE

DEPARTMENT / BRANCH	APPROVAL	DATE
TRANSPORTATION PLANNING AND DESIGN SUPERVISOR		

TRANSPORTATION INFRASTRUCTURE DELIVERY DATE

- MM/DD/YY

SURVEY -

JOB NO. -

SCALE

SCALES SHOWN ARE CORRECT FOR FULL SIZE PLOTS (A1 SHEET SIZE)

DRAWN T. KIRK DATE APR 2024

DESIGNED J. GAGNE DATE APR 2024

CHECKED T. ALEXANDER DATE APR 2024

Edmonton

INTEGRATED INFRASTRUCTURE SERVICES

INFRASTRUCTURE DELIVERY BRANCH

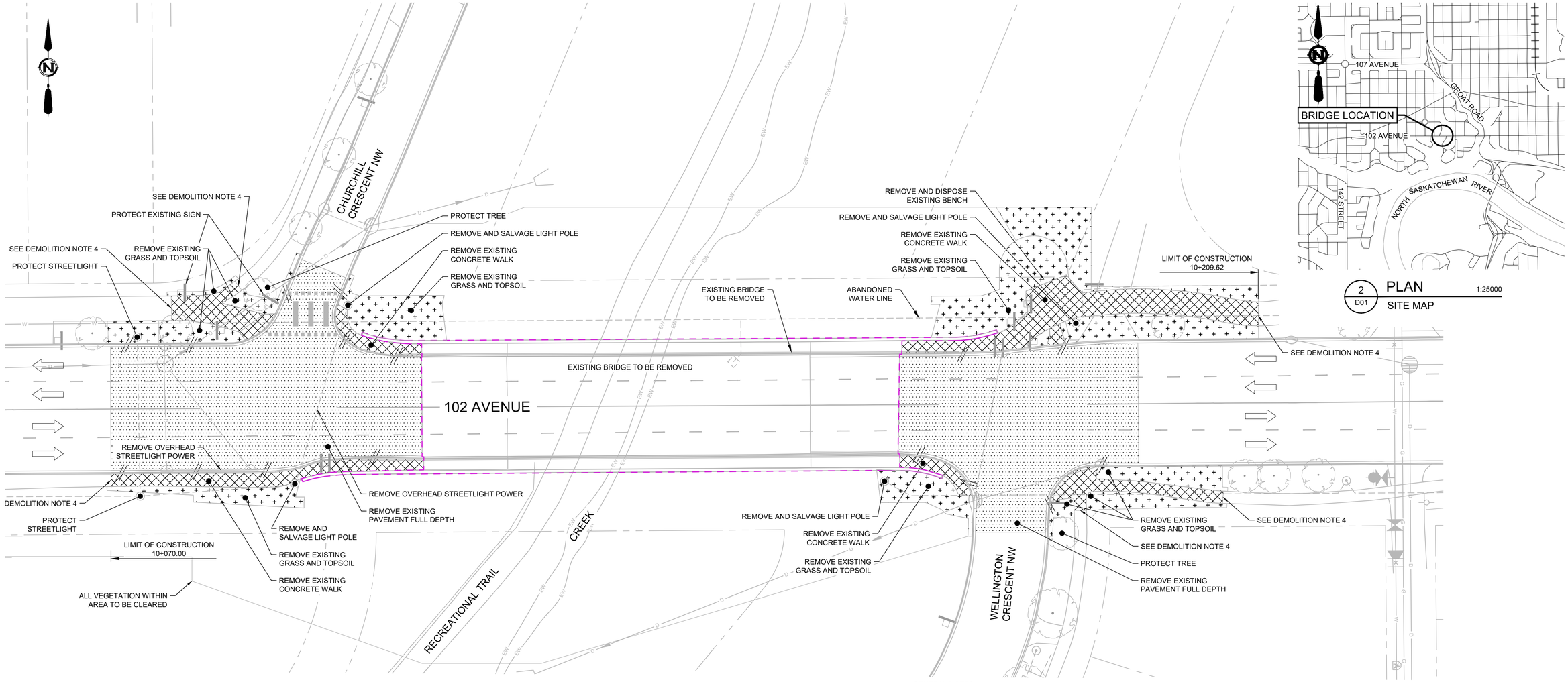
PROJECT

102 AVENUE OVER RAMSAY RAVINE B499 - WELLINGTON BRIDGE REPLACEMENT

MODERN ARCH - GENERAL LAYOUT

DRAWING

A102 P241 S01



2 / D01 PLAN 1:25000
SITE MAP

1 / D01 PLAN 1:250
102 AVENUE

LEGEND

CONCRETE REMOVAL

GRASS AND TOPSOIL REMOVAL

CURB AND / OR GUTTER REMOVAL

FULL DEPTH PAVEMENT REMOVAL

GENERAL NOTES:

1. FINAL LIMITS OF GRASS REMOVAL, BASE REMOVAL, CURB REPLACEMENT AND MILLING AT MATCH LOCATIONS TO BE CONFIRMED WITH THE ENGINEER IN THE FIELD.
2. ALL EXISTING SIGNS AFFECTED BY THE WORK TO BE REMOVED AND SALVAGED.
3. ASPHALT AND CONCRETE REMOVALS TO BE DISPOSED OF AT AN APPROVED FACILITY. CONTRACTOR IS RESPONSIBLE FOR ANY DISPOSAL FEES.
4. EXISTING SURFACE AND UNDERGROUND STRUCTURES SHOWN ON THE DRAWINGS MAY CONTAIN OMISSIONS. MEASUREMENTS AND LOCATIONS OF THE EXISTING UNDERGROUND STRUCTURES SHOWN ON THE DRAINGS ARE NOT GUARANTEED TO BE ACCURATE. CONTRACTOR TO CONFIRM LOCATIONS OF ALL UTILITIES THAT MAY BE IN CONFLICT WITH PROPOSED WORKS.
5. ALL TREE PROTECTION, TREE RELOCATION AND SHRUB BED PROTECTION AND REMOVALS TO BE COORDINATED BETWEEN THE CONTRACTOR AND CONSULTANT/OWNER PRIOR TO COMMENCEMENT OF WORK.
6. ASPHALT AND CONCRETE REMOVALS TO BE DISPOSED OF AT AN APPROVED FACILITY. CONTRACTOR IS RESPONSIBLE FOR ANY DISPOSAL FEES.
7. ALL MATERIAL AND WORKMANSHIP SHALL MEET CITY OF EDMONTON STANDARDS.
8. ADJUST ALL AFFECTED MANHOLE AND CATCH BASIN FRAMES AND COVERS TO MATCH ELEVATION OF NEW ASPHALT.
9. THE CONTRACTOR MUST CONFORM TO THE REQUIREMENTS OF THE CITY OF EDMONTON EROSION AND SEDIMENTATION CONTROL GUIDELINES AND FIELD MANUAL.
10. ALL DIMENSIONS IN METRES UNLESS OTHERWISE NOTED.
11. PROTECT ALL APPURTENANCES TO REMAIN IN PLACE OR TO BE SALVAGED. REPLACE ITEMS DAMAGED DURING CONSTRUCTION ACTIVITY.
12. ALL SIGNS WITHIN THE CONSTRUCTION LIMITS TO BE REMOVED, SALVAGED, AND REINSTATED UNLESS OTHERWISE NOTED.

DEMOLITION NOTES:

1. REMOVE EXISTING CURB, GUTTER AND WALK AS REQUIRED.
2. FINAL LIMITS OF BASE REMOVAL, CURB REPLACEMENT AND MILLING AT MATCH LOCATIONS TO BE FIELD DETERMINED.
3. SAW-CUT ASPHALT AT LIMITS OF FULL DEPTH REMOVALS.
4. LIMIT OF CONCRETE SIDEWALK REMOVALS TO BE CONFIRMED ON SITE. REMOVE UP TO AN EXISTING CONCRETE JOINT.

NO.	REVISIONS	BY	DATE	APP'D
7				
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5				
4				
3				
2				
1	ISSUED FOR DRAFT PRELIMINARY	WM	16APR2024	TA

PROGRAM NO.

CONTRACT NO.

NO.	ISSUE	BY	DATE
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CONSTRUCTION RETURN

CONTRACTOR

SURVEYOR

DATE

FILE NUMBER

CONSTRUCTION ENGINEER DATE

GENERAL SUPERVISOR DATE

DESIGN CONSULTANT

Associated Engineering

PRELIMINARY/ FOR DISCUSSION NOT FOR CONSTRUCTION

APPROVED FOR CONSTRUCTION

DATE

DEPARTMENT / BRANCH	APPROVAL	DATE
TRANSPORTATION PLANNING AND DESIGN SUPERVISOR		

TRANSPORTATION INFRASTRUCTURE DELIVERY DATE - MM/DD/YY

SURVEY -

JOB NO. -

SCALE

SCALES SHOWN ARE CORRECT FOR FULL SIZE PLOTS (A1 SHEET SIZE)

DRAWN T. KIRK DATE APR 2024

DESIGNED J. MAREE DATE APR 2024

CHECKED W. MCKAY DATE APR 2024

Edmonton

INTEGRATED INFRASTRUCTURE SERVICES

INFRASTRUCTURE DELIVERY BRANCH

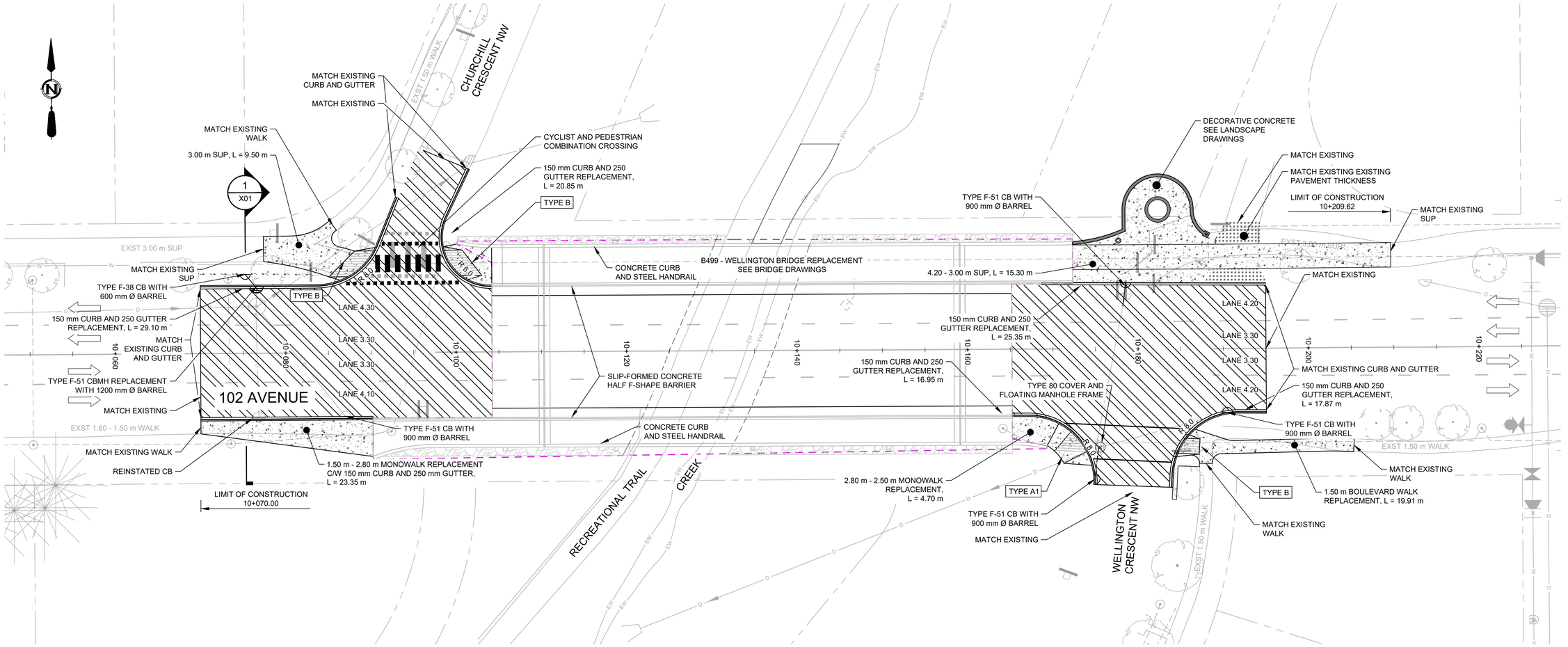
PROJECT

102 AVENUE OVER RAMSAY RAVINE
B499 - WELLINGTON BRIDGE REPLACEMENT

REMOVALS PLAN

DRAWING

A102 P241 D01



LEGEND

FULL REBUILD
60 mm 10 mm-HT ASPHALT
110 mm 20 mm-B ASPHALT
350 mm GRAVEL BASE
150 mm CEMENT STABILIZED SUBGRADE

CONCRETE

ALLEY ASPHALT PAVEMENT

150 mm CURB AND 250 mm GUTTER AS PER COMPLETE STREETS DESIGN AND CONSTRUCTION STANDARDS, DRAWING 5000 FOR CURB AND GUTTER AND DRAWING 5100 FOR MONOLITHIC WALK, CURB AND GUTTER

1 / D02 PLAN 1:250

102 AVENUE

SURFACE UTILITY LEGEND

TROLLEY POLES	TELEPHONE MANHOLE
WOODEN POWER POLE	TELEPHONE POLE
POWER POLE	DRAINAGE MANHOLE (SANITARY)
POWER POLE (SURVEYED)	DRAINAGE MANHOLE (STORM)
STREET LIGHT POLE	CATCH BASIN MANHOLE
STREET LIGHT POLE (SURVEYED)	CATCH BASIN
POWER MANHOLE	FIRE HYDRANT
POLE ANCHOR	FIRE HYDRANT (SURVEYED)
TRAFFIC POLE	WATER VALVE
TRAFFIC POLE (SURVEYED)	WATER TEE
TRAFFIC CABINET	ANODE
NEW LIGHTPOLE	ROADWAY SIGN

GENERAL NOTES:

1. ADJUST MANHOLES AND VALVES AS REQUIRED TO MATCH NEW PAVEMENT.
2. ALL AREAS OF DISTURBANCE ADJACENT TO NEW CONSTRUCTION SHALL BE LANDSCAPED AS REQUIRED.
3. LANDSCAPING OF ALL BOULEVARD AREAS TO MEET COMMUNITY SERVICES SPECIFICATIONS:
   ALL SOD OVER 100 mm TOPSOIL.
   ALL SEED OVER 150 mm TOPSOIL.
4. ALL CURB AND GUTTER CONSTRUCTION TO BE 150 mm STANDARD CURB AND 250 mm GUTTER AS PER DRAWING 5000 OF COMPLETE STREETS DESIGN AND CONSTRUCTION STANDARDS, UNLESS OTHERWISE NOTED.
5. A1 - CURB RAMP AS PER TYPE A1 ON DRAWING 5510 OF COMPLETE STREETS DESIGN AND CONSTRUCTION STANDARDS.
6. A2 - CURB RAMP AS PER TYPE A2 ON DRAWING 5510 OF COMPLETE STREETS DESIGN AND CONSTRUCTION STANDARDS.
7. B - CURB RAMP AS PER TYPE B ON DRAWING 5510 OF COMPLETE STREETS DESIGN AND CONSTRUCTION STANDARDS.
8. C - CURB RAMP AS PER TYPE C ON DRAWING 5510 OF COMPLETE STREETS DESIGN AND CONSTRUCTION STANDARDS.
9. THE PEDESTRIAN CROSSING TO BE CONSTRUCTED AS PER DRAWING 5215 OF COMPLETE STREETS DESIGN AND CONSTRUCTION STANDARDS.
10. CONCRETE WALKS AND SHARED USE PATH AS PER DRAWING 5140 (WITH VARYING WIDTH) OF COMPLETE STREETS DESIGN AND CONSTRUCTION STANDARDS.
11. ALL NEW MONOLITHIC SIDEWALKS TO BE 150 mm BARRIER CURBS AND 250 mm GUTTER, UNLESS OTHERWISE NOTED.
12. REMOVE EXISTING CURB, GUTTER AND WALK AS REQUIRED.
13. ALL TIES ARE TO LIP OF GUTTER (FOR CURB AND GUTTER CONSTRUCTION), TO CURB FACE (FOR SLAB-ON CONSTRUCTION).
14. FINAL LIMITS OF BASE REMOVAL, CURB REPLACEMENT AND GRINDING AT MATCH LOCATIONS TO BE FIELD DETERMINED.
15. NEW OVERLAY TO MATCH LIP OF GUTTER AT ALL NEW CURB RAMP LOCATIONS.
16. SAW-CUT AREAS OF BASE REMOVAL.
17. CATCH BASIN NOTES;
    a. RELOCATE/ADJUST CATCH BASINS TO MATCH NEW ALIGNMENT/GRADES (AS REQUIRED).
    b. IF NEW ASPHALT OVERLAY IS 50 mm OR LESS, WRAP ASPHALT TO MATCH EXISTING LIP OF GUTTER AT ALL CATCH BASINS.
    c. IF NEW ASPHALT OVERLAY IS GREATER THAN 50 mm, RECONSTRUCT CURB, GUTTER AND CATCH BASINS TO MATCH OVERLAY REQUIREMENT.
    d. REPLACE CATCH BASIN FRAMES AND COVERS AS REQUIRED (TO BE DETERMINED IN FIELD).

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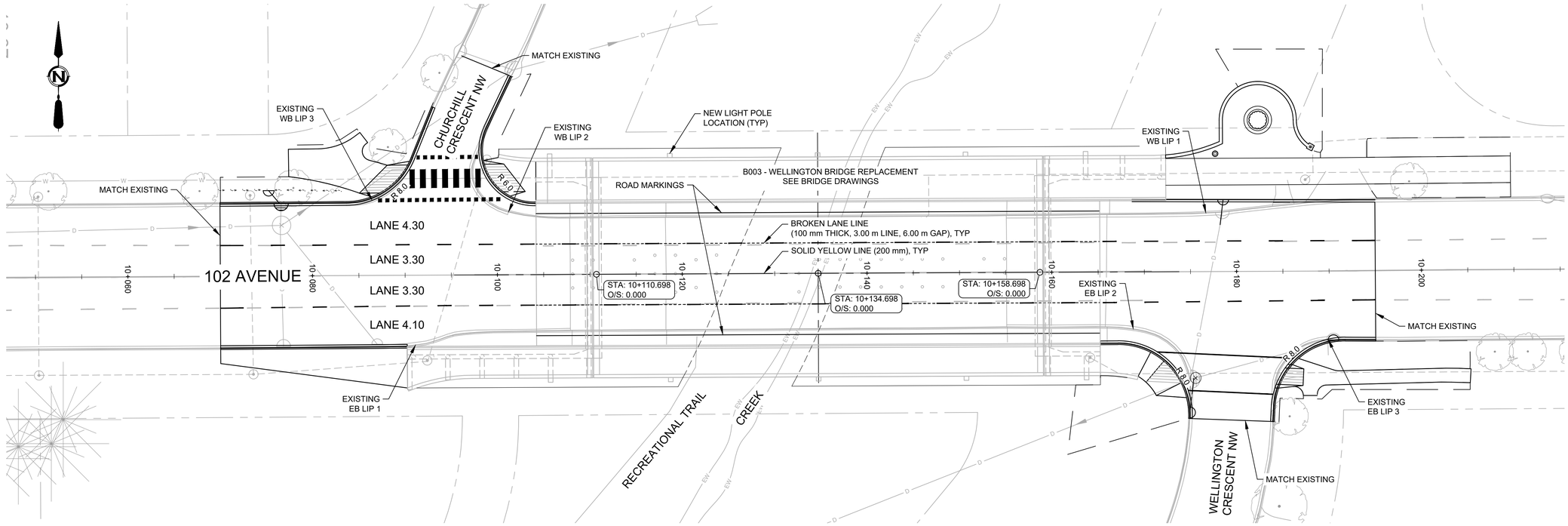
DRAWN T. KIRK DATE APR 2024
DESIGNED J. MAREE DATE APR 2024
CHECKED W. MCKAY DATE APR 2024

Edmonton
INTEGRATED INFRASTRUCTURE SERVICES
INFRASTRUCTURE DELIVERY BRANCH

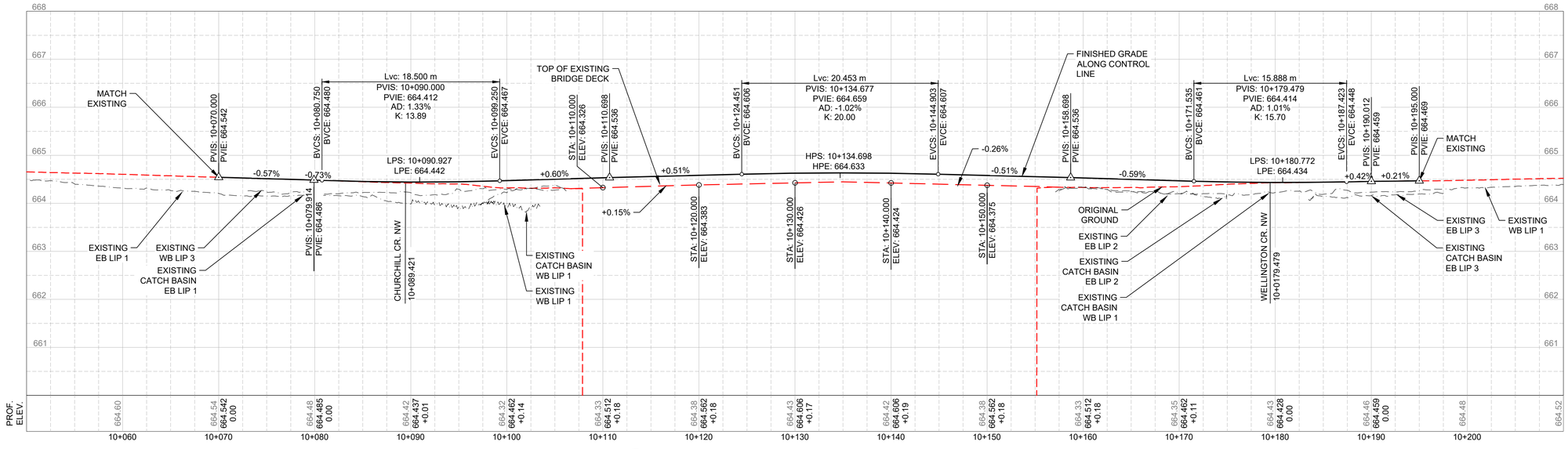
PROJECT
102 AVENUE OVER RAMSAY RAVINE B499 - WELLINGTON BRIDGE REPLACEMENT
NEW CONSTRUCTION PLAN

DRAWING
A102 P241 D02



1 / G01 **PLAN** 1:250

102 AVENUE



2 / G01 **PROFILE** HZ 1:250, VT 1:25

102 AVENUE OVER WELLINGTON BRIDGE

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JOB NO. -

SCALE

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DRAWN T. KIRK DATE APR 2024

DESIGNED J. MAREE DATE APR 2024

CHECKED W. MCKAY DATE APR 2024

Edmonton

INTEGRATED INFRASTRUCTURE SERVICES

INFRASTRUCTURE DELIVERY BRANCH

PROJECT

102 AVENUE OVER RAMSAY RAVINE B499 - WELLINGTON BRIDGE REPLACEMENT

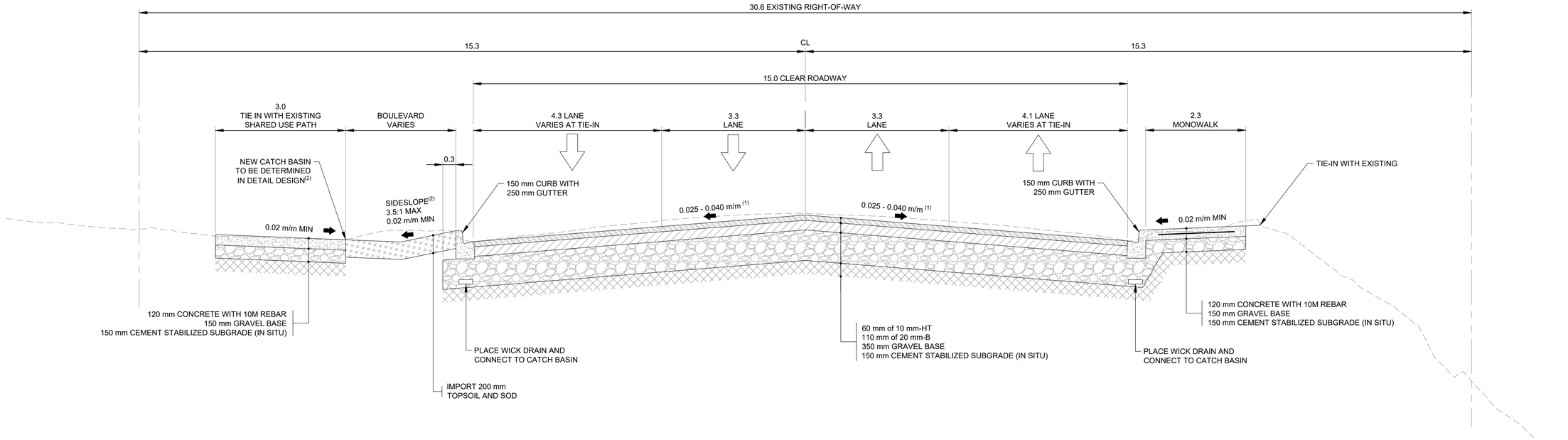
PLAN AND PROFILE

DRAWING

A102 P241 G01

NOTES:

1. THE PROPOSED ROAD CROSSFALL TO BE 2.5% ON THE BRIDGE DECK. THE CROSSFALL WILL INCREASE TO 4.0% AND THEN TRANSITION INTO A PARABOLIC CROWN OVER 10-15 m TO TIE INTO THE EXISTING ROAD.
2. WHERE THE SHARED-USE PATH AND BOULEVARD CANNOT MEET THE MINIMUM SLOPE OF 2.0%. IT IS PROPOSED TO INSTALL A CATCH BASIN AT THE LOW POINT.



1 / X02 SECTION — 1:50 H 1:25 V

TYPICAL AT RECONSTRUCTION OF 102 AVENUE

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SURVEY: -

JOB NO.: -

SCALE: SCALES SHOWN ARE CORRECT FOR FULL SIZE PLOTS (A1 SHEET SIZE)

DRAWN: T. KIRK — DATE: APR 2024

DESIGNED: J. MAREE — DATE: APR 2024

CHECKED: W. MCKAY — DATE: APR 2024

Edmonton

INTEGRATED INFRASTRUCTURE SERVICES

INFRASTRUCTURE DELIVERY BRANCH

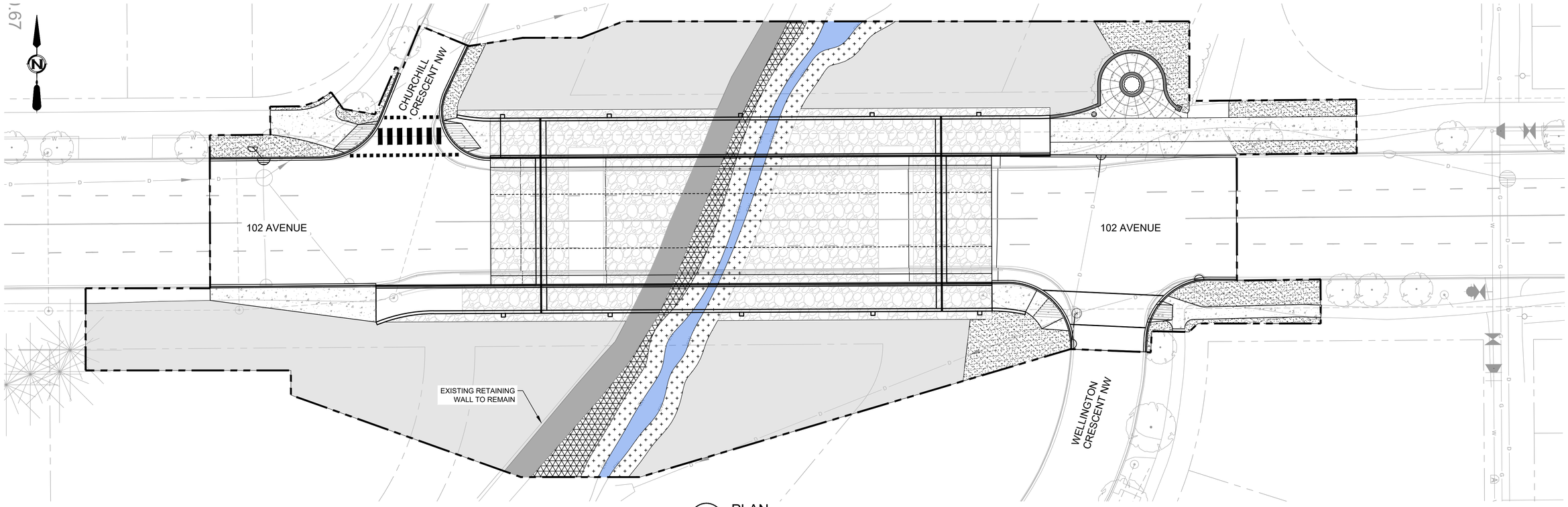
PROJECT

102 AVENUE OVER RAMSAY RAVINE
B499 - WELLINGTON BRIDGE REPLACEMENT

TYPICAL CROSS SECTION

DRAWING

A102 P241 X01



1 / L-100 PLAN 1:250
RESTORATION LAYOUT

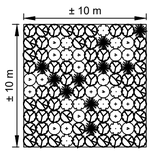
LEGEND

- RESTORATION BOUNDARY
- RESTORED ASPHALT PATH - SEE CIVIL DRAWINGS
- EXISTING CREEK
- CONCRETE WALKWAY - SEE CIVIL DRAWINGS
- RIP-RAP - SEE STRUCTURAL DRAWINGS
- ROUGH AND LOOSE SOIL TREATMENT WITH TREE AND SHRUB PLANTING - TOTAL AREA: 1791 m²
- PARKS MAINTENANCE #1 MIX - SEE LANDSCAPE RESTORATION DRAWING
- LIVE WILLOW STAKING - TOTAL AREA: 256 m²
- SHRUB PLANTING - TOTAL AREA: 128 m²

TREE AND SHRUB PLANTING 10 x 10 ENLARGEMENT SAMPLE

QTY	SYM	BOTANICAL NAME	COMMON NAME	SPACING
CONIFEROUS TREES				
10		*Picea glauca*	White Spruce	1.0 m
DECIDUOUS TREES				
40		*Populus balsamifera*	Balsam Poplar	1.0 m
20		*Populus tremuloides*	Trembling Aspen	1.0 m
DECIDUOUS SHRUBS				
10		*Cornus sericea*	Red Osier Dogwood	1.0 m
10		*Rosa woodsii*	Wild Rose	1.0 m
10		*Symphoricarpus albus*	Snowberry	1.0 m

* TREE AND SHRUB SYMBOLS ILLUSTRATED AT 1.0 m SIZE AND SPACING NOTED ABOVE

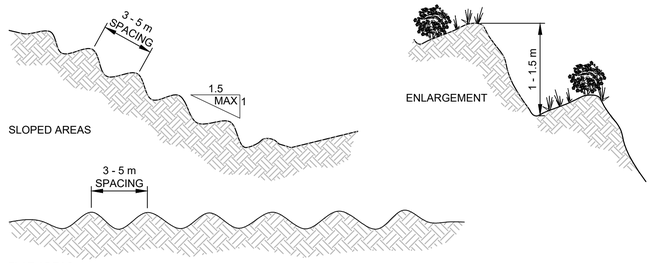


RESTORATION PLANTING QUANTITIES

QTY	SYM	BOTANICAL NAME	COMMON NAME	SIZE	NOTES
CONIFEROUS TREES					
179		*Picea glauca*	White Spruce	1 GAL. POT.	UNIFORM BRANCHING, SINGLE STRAIGHT LEADER
DECIDUOUS TREES					
716		*Populus balsamifera*	Balsam Poplar	1 GAL. POT.	UNIFORM BRANCHING, SINGLE STRAIGHT LEADER
358		*Populus tremuloides*	Trembling Aspen	1 GAL. POT.	UNIFORM BRANCHING, SINGLE STRAIGHT LEADER
DECIDUOUS SHRUBS					
179		*Cornus sericea*	Red Osier Dogwood	1 GAL. POT.	SHRUBS TO BE FULL AND HAVE NATURAL FORM
179		*Rosa acicularis*	Prickly Wild Rose	1 GAL. POT.	SHRUBS TO BE FULL AND HAVE NATURAL FORM
179		*Symphoricarpus albus*	Snowberry	1 GAL. POT.	SHRUBS TO BE FULL AND HAVE NATURAL FORM

SHRUB PLANTING

QTY	BOTANICAL NAME	COMMON NAME	SIZE	NOTES
DECIDUOUS SHRUBS				
32	*Cornus sericea*	Red Osier Dogwood	1 GAL. POT.	SHRUBS TO BE FULL AND HAVE NATURAL FORM. 1.0 m SPACING
32	*Rosa acicularis*	Prickly Wild Rose	1 GAL. POT.	SHRUBS TO BE FULL AND HAVE NATURAL FORM. 1.0 m SPACING
32	*Symphoricarpus albus*	Snowberry	1 GAL. POT.	SHRUBS TO BE FULL AND HAVE NATURAL FORM. 1.0 m SPACING
32	*Viburnum trilobum*	Highbush Cranberry	1 GAL. POT.	SHRUBS TO BE FULL AND HAVE NATURAL FORM. 1.0 m SPACING



NOTES:

1. TOPSOIL AND COARSE WOODY DEBRIS TO BE SALVAGED PRIOR TO CONSTRUCTION AND STOCKPILED FOR USE DURING RESTORATION.
2. ROUGH AND LOOSE SOIL TREATMENT TO BE INSTALLED ON SLOPES 2:1 OR FLATTER. MODIFIED BRUSH LAYERS TO BE INSTALLED IN STEEPER AREAS WHERE SOIL ROUGHENING CANNOT BE COMPLETED DUE TO EQUIPMENT ACCESS.
3. ROUGHEN THE SURFACE TO CREATE HOLES AND MOUNDS.
4. CREATE HOLES USING AN EXCAVATOR WITH A DIGGING BUCKET.
5. PLACE SOIL HALF IN AND HALF OUT OF THE HOLE THAT WAS JUST SCOOPED OUT.
6. MOVE HALF BUCKET WIDTH TO THE RIGHT OF FIRST HOLE AND TAKE ANOTHER SCOOP OF SOIL AND TAKE CARE TO SHATTER THE COLUMN BETWEEN THE HOLES WITH THE SIDE OF THE BUCKET PLACING IT BETWEEN THE TWO HOLES.
7. MOVE A HALF BUCKET WIDTH TO THE RIGHT OF THE SECOND HOLE AND TAKE ANOTHER SCOOP OF SOIL PLACING BETWEEN THE SECOND AND THIRD HOLES.
8. REPEAT WITHIN REASONABLE SWING OF EXCAVATOR THEN BACK UP THE WIDTH OF THE ROW OF HOLES AND MOUNDS LINING UP THE HOLES IN THE NEW ROW WITH THE MOUNDS IN THE PREVIOUS ROW.
9. CONTINUE UNTIL WHOLE AREA IS COVERED WITH HOLES AND MOUNDS.

2 / L-100 DETAIL NTS
ROUGH AND LOOSE SOIL TREATMENT

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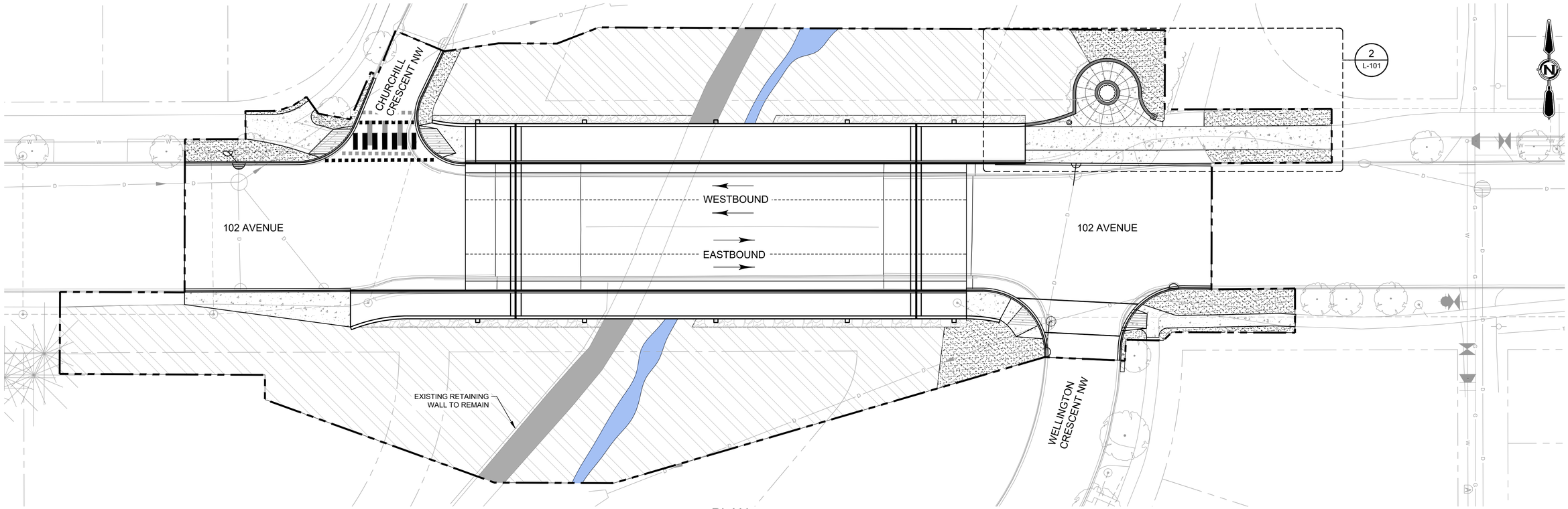
SURVEY -
JOB NO. -
SCALE
SCALES SHOWN ARE CORRECT FOR FULL SIZE PLOTS (A1 SHEET SIZE)

DRAWN D. CHARTRAND DATE 04/16/24
DESIGNED K. ANDERSEN DATE 04/16/24
CHECKED C. ISHII DATE 04/15/24

Edmonton
INTEGRATED INFRASTRUCTURE SERVICES
INFRASTRUCTURE DELIVERY BRANCH

PROJECT
102 AVENUE OVER RAMSAY RAVINE B499 - WELLINGTON BRIDGE REPLACEMENT
RAVINE AND CREEK RESTORATION

DRAWING
A102 P241 L01



PLAN 1:250

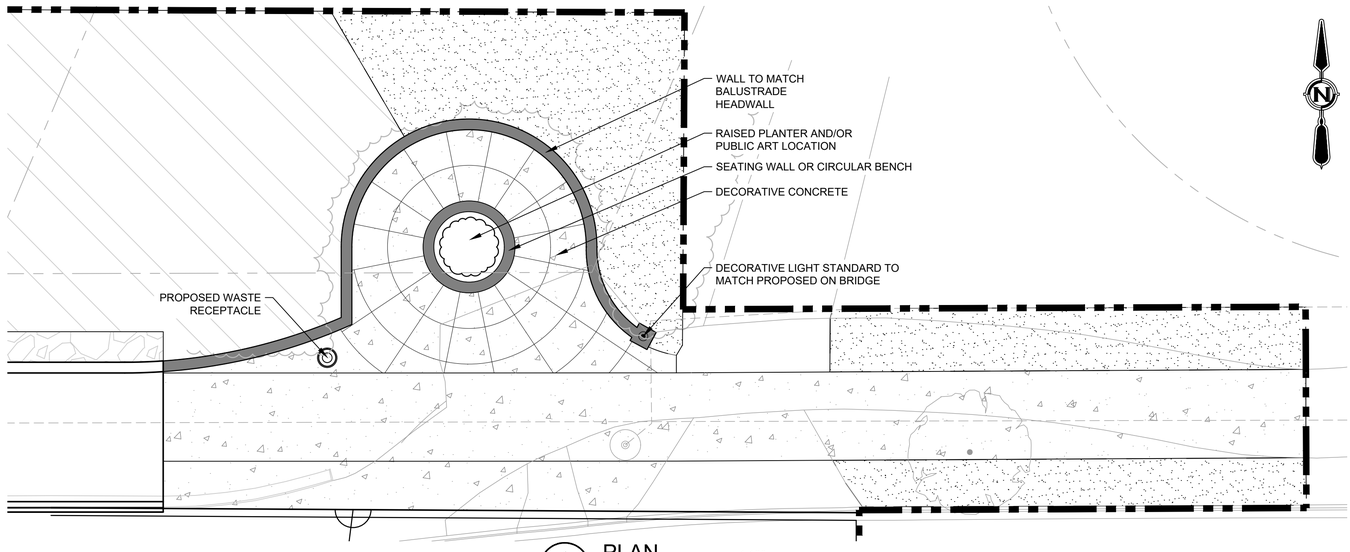
LANDSCAPE RESTORATION

LEGEND

- RESTORATION BOUNDARY
- RESTORED ASPHALT PATH - SEE CIVIL DRAWINGS
- EXISTING CREEK
- CONCRETE WALKWAY - SEE CIVIL DRAWINGS
- RIP-RAP - SEE STRUCTURAL DRAWINGS
- RESTORATION TREATMENTS - SEE RAVINE AND CREEK RESTORATION DRAWING
- PARKS MAINTENANCE #1 MIX OVER 150 mm TOPSOIL - TOTAL AREA: 318 m²

PARKS MAINTENANCE #1 MIX

TOUCHDOWN KENTUCKY BLUEGRASS	30%
CREEPING RED FESCUE	30%
BANFF KENTUCKY BLUEGRASS	20%
FIESTA II PERENNIAL RYE GRASS	20%



1 / L-101 PLAN 1:100

NODE ENLARGEMENT

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TRANSPORTATION INFRASTRUCTURE DELIVERY DATE: - MM/DD/YY

Edmonton

INTEGRATED INFRASTRUCTURE SERVICES

INFRASTRUCTURE DELIVERY BRANCH

SURVEY: -

JOB NO.: -

SCALE: SCALES SHOWN ARE CORRECT FOR FULL SIZE PLOTS (A1 SHEET SIZE)

DRAWN: D. CHARTRAND 04/16/24

DESIGNED: J. BENNETT 04/16/24

CHECKED: M. KEITH 04/16/24

PROJECT

102 AVENUE OVER RAMSAY RAVINE B499 - WELLINGTON BRIDGE REPLACEMENT

LANDSCAPE RESTORATION

DRAWING

A102 P241 L02

Achyut Adhikari

APPENDIX E – WELLINGTON BRIDGE REPLACEMENT BAT MITIGATION PLAN

Associated Engineering | GLOBAL PERSPECTIVE. LOCAL FOCUS.

REPORT

City of Edmonton

Wellington Bridge Replacement
Bat Mitigation Plan

APRIL 2024

TABLE OF CONTENTS

1 INTRODUCTION

Wellington Bridge, constructed in 1932, is a three-span concrete arch bridge that carries 102 Avenue NW over the Ramsay Ravine in Edmonton, Alberta. The bridge is in poor condition and has reached the end of its lifespan. Since 2014, the bridge has been supported by a temporary falsework system to safely maintain vehicular traffic until the bridge is replaced. The City of Edmonton (the City) retained Associated Engineering Alberta Ltd. (Associated) to complete preliminary design, detailed design, resident engineering, and post-construction services for the replacement of the Wellington Bridge at 102 Avenue NW over the Ramsay Ravine, including the shared use path (the Project). As the Ramsay Ravine is part of the North Saskatchewan River Valley and within the North Saskatchewan River Valley Area Redevelopment Plan, Bylaw 7188 (City of Edmonton 2018), an environmental impact assessment (EIA) was completed for the Project in September 2021.

As part of the EIA, Associated's Erin Cawthorn, BIT, and Stephanie Findlay, P.Biol., conducted a bat survey on July 4, 2021. The survey identified bats roosting in the gaps, cracks, and expansion joint of Wellington Bridge. A maternity colony was identified in the expansion joint adjacent to the abutment on the east side of the bridge. In addition, other bats were observed roosting in a crack between the concrete on the underside of the bridge, west of the pedestrian pathway. A large amount of bat guano and two adult carcasses were identified beneath the maternity roost and were sent in for genetic testing. The DNA test results identified that the fecal matter and carcasses were associated with the little brown bat (*Myotis lucifugus*), which is protected provincially and federally. Little brown bat is listed as Threatened under Schedule 6 of the *Wildlife Regulation* and Endangered under the *Species at Risk Act*. The presence of a little brown bat maternity roost under the Wellington Bridge presents a unique situation, whereby the Project will permanently remove vital habitat during critical life stages for the species. Therefore, the Project cannot proceed until mitigation measures have been developed to protect the bats. The City retained Associated to develop a mitigation plan to prevent harm to the little brown bat and provide it with supplemental habitat during bridge replacement activities.

2 BACKGROUND

2.1 Site Description

Wellington Bridge is located in SE 01-053-25 W4M of the Alberta Township System and exists within in the North Saskatchewan River Valley and Ravine System overlay. The bridge crosses over the Ramsay Ravine at 102 Avenue NW between Wellington Crescent NW and Churchill Crescent NW, on lands that are owned by the City.

Land uses in the Project area include vehicular and pedestrian transportation on 102 Avenue NW, natural forested areas of the Ramsay Ravine, an unnamed watercourse at the bottom of the ravine (waterbody ID 44445), and recreational activities on the multi-use trail at the bottom of the ravine. Well-established residential communities exist east and west of the Ramsay Ravine. Wellington Bridge provides an important transportation connection to the City's downtown core. Zoning of the lands in the Project area includes Metropolitan Recreation Zone (A), Public Parks Zone (AP), and Single Detached Residential Zone.

The Ramsay Ravine is a forested, meandering valley. The east and west banks of the ravine consist of steep, heavily forested slopes that flatten out toward the centre. The centre of the ravine is relatively flat and contains a shared-use path to the east of an unnamed watercourse (waterbody ID 44445) that bisects Wellington Bridge.

Slopes in the Project area are approximately 3H:1V, and some sections approach 2H:1V (Thurber Engineering Ltd. 2021). Slope stability and erosion issues throughout the Ramsay Ravine have resulted in four landslide areas in and immediately adjacent to the Project area.

As per the City's Urban Primary Land and Vegetation Inventory, the Project area consists of naturally wooded areas classified as forested stand types and developed areas classified as established residential communities (City of Edmonton 2024). In the Project area, an open area of maintained grass exists at the crest of the ravine on the southeast side of Wellington Bridge. Northwest of Wellington Bridge, outside the Project area, another open area of maintained grass exists where the shared-use path from the ravine connects with Churchill Crescent NW. Landscape trees grow along 102 Avenue NW, Churchill Crescent NW, and Wellington Crescent NW.

The forested areas surrounding the Wellington Bridge are deciduous dominated, while the understorey is dominated by shrubs. Herbaceous plants in the Project area are limited due to the dense shrub layer. The vegetation in the Project area is characteristic of an area that has been influenced by human disturbance, given the occurrence and cover of many non-native species. With regard to wildlife habitat quality, most of the land in the Project area is considered moderate to high value, as per the City's Environmental Sensitivities database (City of Edmonton 2016). Small areas in the Project area are considered very high and extremely high wildlife habitat value. The existing bridge structure provides passage for wildlife, frequently used by birds and small- to medium-sized mammals.

2.2 Field Survey Methods and Results

The EIA identified bats roosting in the gaps and cracks of Wellington Bridge. Therefore, a bat survey was conducted to determine the nature of the bat roost in the bridge structure.

The bat survey was completed on July 4, 2021 to determine the presence or absence of bat roosts in the bridge structure. The survey included the use of passive and active acoustic detectors and infrared cameras. The survey methods followed those in the Handbook of Inventory Methods and Standard Protocols for Surveying Bats in Alberta (AFWD 2010). Additional surveys were completed by the City in 2023 and included acoustic and fecal analysis (Mazur 2024).

The bat survey identified a maternity colony roost in expansion joint adjacent to the abutment on the east side of the bridge. Degraded pieces of foam along the east abutment created the void space for the maternity colony. In addition to using the expansion joint as a maternity roost, bats were also using cracks between the concrete on the underside of the bridge, west of the pedestrian pathway, as a roost. Foam pieces along the west abutment appear in better condition and there is less void space available.

A large amount of guano had accumulated beneath the maternity colony roost at the east bridge abutment, indicating frequent use by many individuals and reuse over several years. Two live bat pups, one female and one male, were observed below the maternity colony roost at the east bridge abutment. These pups were young-of-the-year and non volant. One pup was retrieved by the mother after sunset.

At least 26 individuals were counted during the point count survey on July 4, 2021, although the maternity colony roost likely contains more individuals. Based on the frequency of the echolocation calls, at least two species of bats appeared to be using the maternity colony roost. Low-frequency calls (i.e., 20–40 kHz) indicate a large-bodied bat species, and high-frequency calls (i.e., 50–80 kHz) indicate a small-bodied bat species. Low- and high-frequency echolocation calls were both recorded emerging from the maternity roost. Two adult carcasses of a small-bodied bat

species were located at the base of the maternity colony roost; however, these species could not be identified in the field. Carcasses and feces were collected for species identification through genetic testing. After the 2023 surveys, the City identified accumulated guano along the west abutment expansion gap, and additional acoustic surveys identified additional bat species in the ravine, including the hoary bat (*Lasiurus cinereus*).

The bat carcasses and feces were sent to Northern Arizona University for metabarcoding. The genetic testing detected only the little brown bat. Little brown bat is federally and provincially protected. This species is listed as Threatened under Schedule 6 of the *Wildlife Regulation*. Further, it is listed as Endangered under the *Species at Risk Act*; therefore, the roosting locations in Wellington Bridge are considered critical habitat. The Project will result in the loss of habitat for maternity roosting bats once the bridge is demolished. Thus, a mitigation plan, including long-term and short-term strategies, must be developed to provide long-term roosting habitat and reduce the impacts of the Project on little brown bat maternity roosting activities.

2.2.1 Life History of Little Brown Bat

Little brown bats are small, brown bats with black ears, wings, and a tail membrane (van Zyll de Jong 1985). They weigh approximately 7–9 g and have a wingspan of approximately 22–27 cm, with females slightly larger than males (Harvey et al. 2011). Their diet can vary significantly based on geographic location; however, they generally feed nocturnally on insects (e.g., moths, mayflies, flies, beetles, and caddisflies) and spiders (Moosman et al. 2012, Clare et al. 2014).

In Canada, little brown bats have been confirmed in every province and territory, except for Nunavut. The Canadian populations of little brown bats generally use the boreal forest south of the treeline, down to the US border (COSEWIC 2013). The habitat requirements for little brown bats vary seasonally and consist of overwintering habitat (for hibernation and overwinter survival); summering habitat, including roosts (i.e., maternity roosts and night roosts) within commuting distance of foraging habitat; and swarming habitat for late summer and early fall mating and socializing (Norquay et al. 2013, Randall and Broders 2014). Wellington Bridge consists of summer roosting habitat for little brown bats but does not provide suitable overwintering habitat. Therefore, only roosting habitat is relevant to the Project and is the only habitat type explored in this report.

Roosts provide thermal regulation and shelter from weather and predation and can be the sites for interaction (Barclay and Kurta 2007). Roost selection is a function of numerous characteristics occurring at a range of spatial scales, including roosting structure, stand-scale, and landscape scale effects (Fabianek et al. 2011). Little brown bats use buildings and other anthropogenic structures (e.g., bridges, bat boxes) to roost; however, they also use natural features if suitable ones exist (Slough 2009, Randall et al. 2014).

Females choose suitable maternity roosts at the expense of travelling longer distances to forage, indicating a limited number of suitable maternity sites (Randall et al. 2014). Female little brown bats show a high degree of philopatry, returning to the same natural maternity roost sites for upwards of 10 years and anthropogenic structures for upwards of 50 years (COSEWIC 2013). Maternity colonies are used for giving birth and raising pups and are usually active in the spring/summer, and inactive in the fall/winter (Figure 1).

Major threats to the little brown bat include residential and commercial development, agriculture and aquaculture, energy production and mining, transportation and service corridors, biological resource use, human intrusion and disturbance, natural system modification, invasive and other problematic species, and pollution (COSEWIC 2013).

3 MITIGATION MEASURES

3.1 Alternative Bat Habitat

Removing Wellington Bridge will result in the loss of roosting habitat for little brown bats in the Ramsay Ravine. This habitat loss may cause the existing maternity colony to disperse and move into adjacent residential properties or may cause them to harm other tree-roosting bat species in the ravine. Providing alternative habitat by installing bat boxes will offset the loss of habitat and promote roosting in locations away from residential areas (Miller 2018). Bat boxes must be designed in a way that provides suitable conditions to ensure individuals can reproduce successfully; otherwise, the colony may decline over time. Single-chambered boxes and rocket-style boxes do not appear to attract bats in urban settings and are not recommended as alternative habitat (Miller 2018). Multi-chambered bat boxes can support hundreds of bats and allow for movement within the roost to access warmer areas or prevent overheating (Alberta Community Bats 2023).

The following bat box design specifications are recommended when constructing bat boxes and were adapted as per the Holroyd et al. (2023) Best Management Practices for the Use of Bat Houses in the U.S. and Canada:

- Use a design similar to the Bat Conservation International's four-chambered nursery house (Appendix B).
- Design the box to a minimum of 61 cm tall and 43 cm wide.
- Use wood screws (exterior grade, weatherproof, stainless or galvanized steel, Teflon-coated). Bend or file off any exposed sharp edges.
- Construct boxes using 1 cm thick wood (exterior-grade plywood, pine, cedar, etc.); plastics and other synthetic materials do not provide sufficient insulation.
- Locate vertical landing strips below the entrance of the box.
- Ensure that the interior chamber spacing ranges between 1.9 cm and 2.5 cm.
- Cut or drill holes through the interior panels to allow for access to other chambers.
- Roughen or score wood with grooves on the landing strips and in the interior chambers to provide grip points for the bats.
- Paint or stain the exterior of the box with a dark colour to promote absorption of solar radiation. The paint/stain must be exterior grade and water based. Oil-based paints or stains contain high amounts volatile organic compounds and will deter or potentially harm bats.
- Seal (using caulking or glue) all seams to limit heat loss and prevent water penetration.

Bat boxes should be placed near the same ravine as the existing maternity roost but far enough to avoid disturbance while the bridge is removed and reconstructed. Bridge construction activities will present a high degree of disturbance and may act as a physical barrier in the ravine. As a result, bat boxes must be placed at least 150 m south of the bridge structure to limit disturbance during construction, retain fidelity to the ravine, and allow access to the North Saskatchewan River. Tree-roosting bat species, such as the northern long-eared bat (*Myotis septentrionalis*), may also roost in the ravine, and individuals displaced from the bridge structure may harm other resident species. It is not recommended to scatter bat boxes throughout the ravine as it will increase competition for other bat species in the area (Olson 2024).

The following bat box installation specifications are recommended when placing the bat boxes and were adapted as per the Holroyd et al. (2023) Best Management Practices for the Use of Bat Houses in the U.S. and Canada:

- Install bat boxes in the suitable areas identified in Figure 2. Exact locations must be approved by the City project manager.
- Install boxes between March 1 and May 31, 2024, before the bats arrive from their overwintering habitat.
- Consider installing four bat boxes to mitigate for the loss of the maternity roost.
- Mount boxes on poles as much as possible.
- Install boxes 3 to 5 m above the ground surface to protect from ground predators and human interference.
- Install boxes away from tree limbs or large perches. Prune adjacent limbs or perches if necessary.
- Install predator-deterring features, such as bird spikes and sheet metal wraps.
    - Sheet metal wraps should be at least 1 m off the ground.
- Place bat boxes away from areas illuminated by street lights.
- Install boxes individually or with two boxes placed back-to-back.
- Install boxes in areas with varying degrees of solar exposure (i.e., sunny, south-facing areas and shady areas) to provide habitat for species with differing ecological requirements.

3.2 Bridge Exclusion Methods

By law in Alberta, bats cannot be excluded from any structure, including bridges, during periods when females are raising their pups (GoA 2024). For maternity roosts, female bats typically arrive mid-March and give birth in June (Alberta Community Bats 2019). Pups are born non volant (they cannot fly) and remain in the roost overnight when females emerge to forage or drink (Altringham 2011). Using exclusion materials is not permitted once the pups have been born as these measures will trap individuals within the bridge structure (GoA 2024). By late summer, pups begin to fly; however, they continue to return to the maternity roost until mid-September, when the females and young-of-the-year migrate to their overwintering habitat. These are general timing windows, and the arrival and departure of bats can vary if seasonal temperatures are not suitable for spring or fall migration.

Based on the proposed Project schedule, bridge removal activities are anticipated to begin in August 2025, directly affecting the active period for the maternity roost. To avoid affecting roosting bats, implement exclusion measures in fall or winter 2024, after females and young-of-the-year have left the roost. The following exclusion practices should be adhered to and were developed as per the Best Management Practices for Bats in British Columbia: Chapter 9 Bridges (BC Ministry of Environment and Climate Change Strategy 2022) guidelines:

- Do not undertake exclusion activities while the roost is occupied (mid-March to mid-September).
- Conduct a wildlife survey no more than 7 days before installing exclusion measures.
    - If a wildlife survey cannot confirm that roosts are vacant, postpone exclusion activities until overnight temperatures fall below freezing for at least 1 week concurrently.
- Retain a qualified environmental professional to supervise the installation of bat exclusion measures.
- If a bat is discovered while exclusion measures are installed, stop work immediately and contact the site environmental professional determine additional mitigation measures.
- Fill roost entrances and any other potential roosting crevices with expanding foam, caulking, weather stripping, or sealant.
- Install netting, with mesh no larger than 3/8″, under the entire of the bridge deck.
    - Avoid placing netting below any bridge drains to avoid damaging the net.
- Do not use toxic materials, sticky fly ribbon, or glue traps.

- Inspect exclusion materials on a regular basis, especially after heavy rain, snow, or high-wind events. Repair any damaged exclusion materials as soon as possible.
- If exclusion materials are damaged during periods when bats may be present, an addition wildlife sweep may be required to ensure bats have not circumvented the exclusion materials.
- Do not handle bats. Bats may be handled only by a qualified environmental professional with a recent rabies vaccination or antibody immunity testing.
- Handle all bat in accordance with the Government of Alberta's Alberta Wildlife Animal Care Committee Class Protocol #004 (2005) and the Addendum to Class Protocol #004: Bat Capture, Handling, and Release (2009).

3.3 Construction Mitigation Measures

The probability of encountering bats in the Ramsay Ravine during construction is high. The following mitigation measures are recommended during construction to limit direct and indirect impacts to bat species:

- Ensure all bridge construction activities, including site access routes, laydown areas, or stockpiling, are not located within 100 m of the bat boxes placed as alternative habitat.
- Schedule high-impact disturbance activities (i.e., demolition, vegetation clearing, piling) outside the sensitive species windows to avoid impacts.
- Avoid scheduling construction activities overnight between May 1 and August 31, where possible.
- Before the bridge is demolished, inspect exclusion materials regularly, especially after heavy rain, snow, or high-wind events. Repair any damaged exclusion materials as soon as possible.
- Inspect bat boxes for signs of vandalism or damage. Report any deficiencies to the site supervisor and City project manager.
- Avoid illuminating non-essential areas of the Project after sunset between May 1 and August 31.
    - Illumination may be a suitable deterrent to exclude bats from sensitive areas of the construction site.
- If a bat is discovered in the Project area (i.e., roosting on the side of equipment or on a structure), stop work and contact the site supervisor and/or project manager immediately.
    - A qualified environmental professional may need to relocate bats roosting on equipment or any construction structures before work resumes.
    - If a bat comes into direct contact with a worker, stop work and report the incident immediately. The worker may require medical attention.
- Report all bat sightings to the site supervisor, City project manager, and consulting engineer project manager.

CLOSURE

This report was prepared for the City of Edmonton to provide guidance with regard to the provisions of alternative bat habitat, bat exclusion activities, and construction mitigation measures.

The services provided by Associated Engineering Alberta Ltd. in the preparation of this report were conducted in a manner consistent with the level of skill ordinarily exercised by members of the profession currently practising under similar conditions. No other warranty expressed or implied is made.

Respectfully submitted,

Associated Engineering Alberta Ltd.

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APPENDIX A – FIGURES

\\AE.CA\DATA\WORKING\EDM\2020-3858-00\GIS\ARCPRO\WILDLIFE\REV0\AE20203858_BAT_HAB_REV0.APRX
IMAGERY: ESRI, DIGITALGLOBE, GEOEYE, I-CUBED, USDA FSA, USGS, AEX, GETMAPPING, ROAD: STATISTICS CANADA, 2022. HYDROGRAPHY: ALTALIS LTD., 1996; ATS GRID: ALTALIS LTD., 2020.

Associated Engineering

Edmonton

LEGEND

- Alternative Habitat
- Bridge Footprint
- Buffer (150m)

Base Data

- Highway
- Watercourse
- Water Body

0 20 40 60 80 100 m

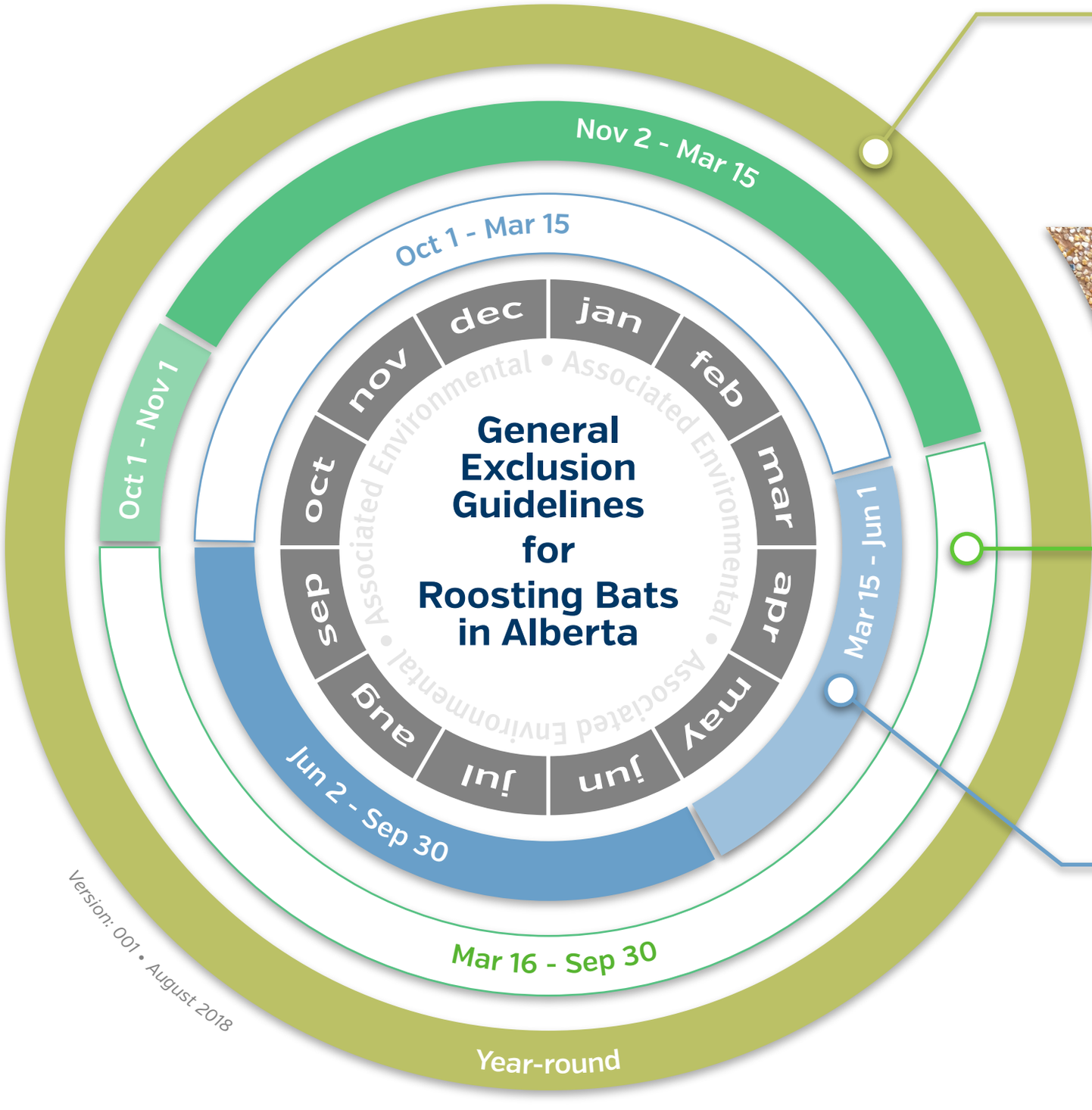
AE PROJECT NO.	2020-3858-00
SCALE	1:5,000
COORD. SYSTEM	NAD 1983 3TM 114
DATE	2024-03-05
REV	00
DRAWN BY	WL
CHECKED BY	JL
DESCRIPTION	ISSUED FOR INFO

FIGURE 2
ALTERNATIVE HABITAT LOCATIONS

CITY OF EDMONTON
WELLINGTON BRIDGE REPLACEMENT

BAT MITIGATION PLAN

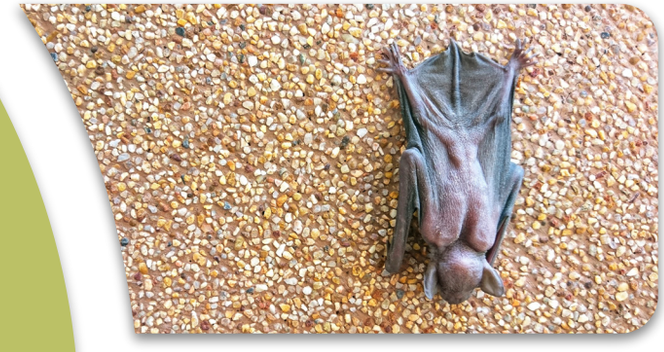
Restrictions Based on Roost Type as Determined by Bat Survey



Version: 001 • August 2018

Year-round Occupation

Considered active all year; requires written permission from Minister for exemption to Section 36(1) of the Wildlife Act



Hibernaculum

March 16 - September 30:
Best time to exclude

October 1 - November 1:
Exclusion possible using one-way exits

November 2 - March 15:
Do not exclude or disturb

Maternity Colony

June 2 - September 30:
Do not exclude or disturb

October 1 - March 15:
Best time to exclude

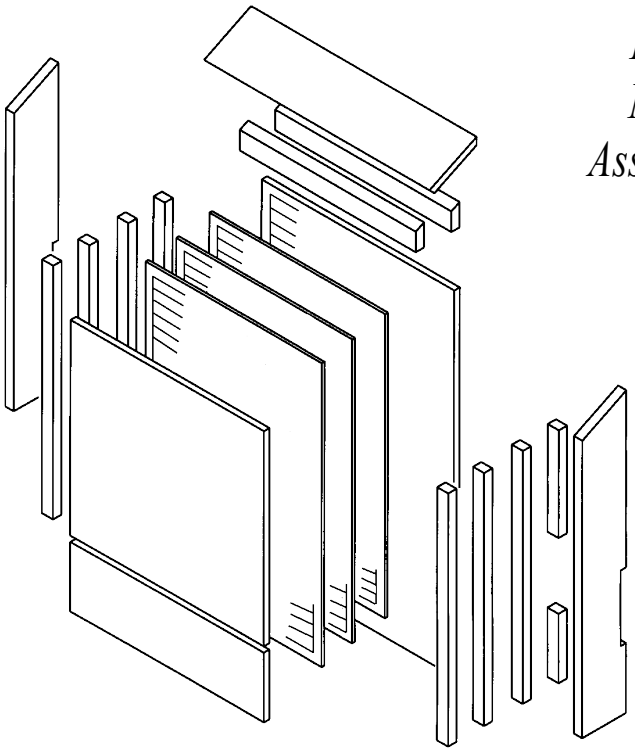
March 16 to June 1:
Exclusion possible using one-way exits

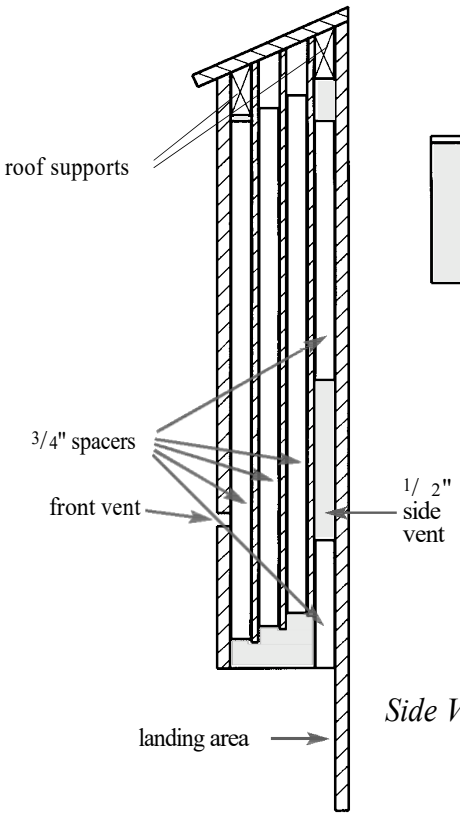
APPENDIX B – BAT BOX DESIGN

Adapted from The Bat House Builder's Handbook

FIGURE 1

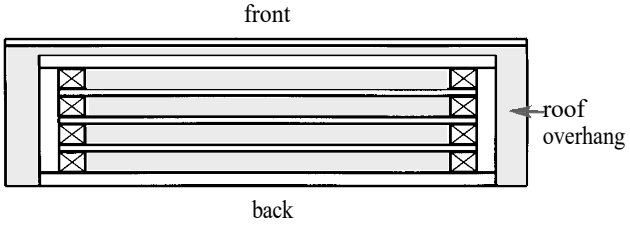
Four-chamber Nursery House Assembly Diagrams

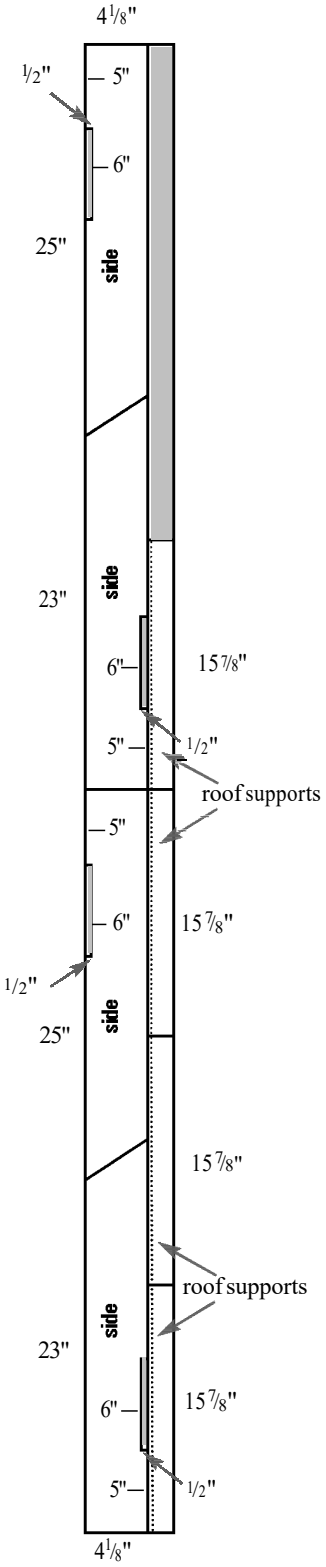




Side View

Bottom View

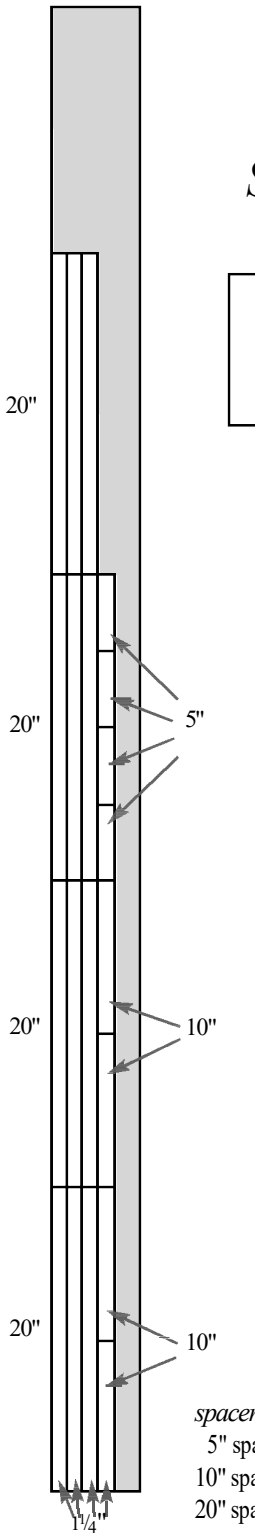




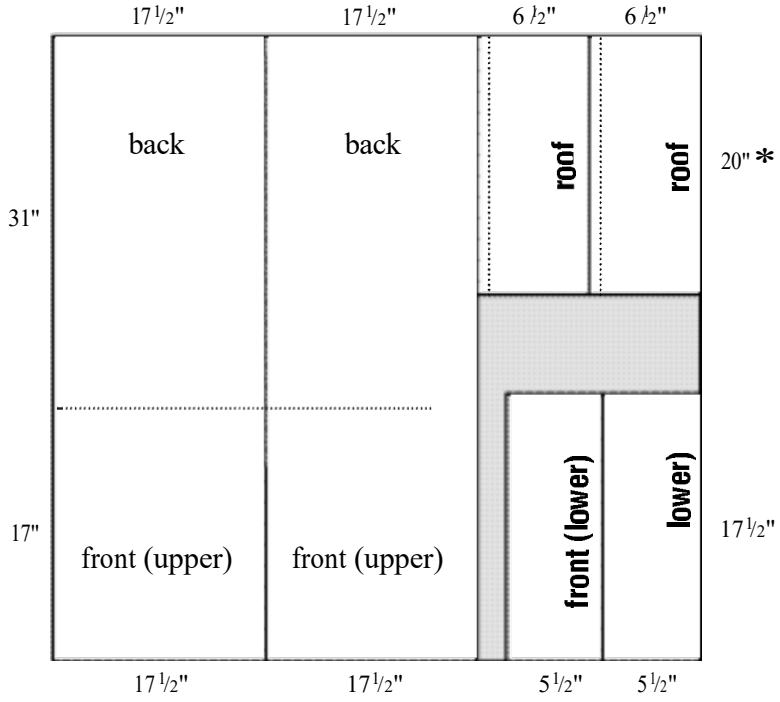
1" x 6" x 8' board

FIGURE 2

Four-chamber Nursery House Sawing Diagrams

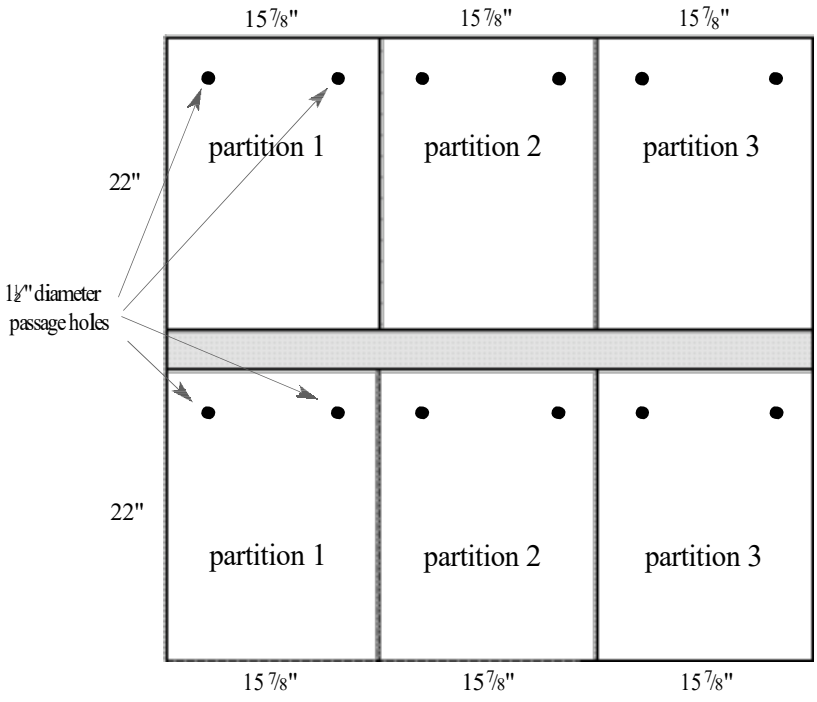


1" x 6" x 8' board



4' x 4' x ½" plywood

* 19" if mounted between two poles



4' x 4' x ⅜" plywood