

PRELIMINARY DESIGN REPORT

Engineering Services for the Capital Line South LRT Extension (Century Park to Ellerslie Road)



PREPARED FOR



Blackmud Creek Crossing -
Site Location Study

NOVEMBER 2024

Rev. 2



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Executive Summary

The 2019 Site Location Study (SLS) was revised in 2024 to include a summary of design changes, and updated references and regulatory legislation.

This SLS is intended to meet the requirements under the North Saskatchewan River Valley Area Redevelopment Plan, Bylaw 7188 (City of Edmonton 2018), which states that developments that are deemed by the City of Edmonton (the City) as “Major Facilities” or have not been reviewed by City Council require completion of a SLS (City of Edmonton 2018). The purpose of the SLS is to confirm the need for the proposed development of the Capital Line South Extension Light Rail Transit (LRT) Blackmud bridge and multi-use trail (MUT) within the Blackmud Creek valley. Associated Environmental Consultants Inc. (Associated) was retained by the City to complete this SLS.

In the City’s Transportation Master Plan (City of Edmonton 2009), public transit, including Light Rail Transit (LRT), is identified as a key component in shifting Edmonton’s transportation system from a car-oriented system to one that emphasizes active and public modes of transportation. The Capital Line South Extension is part of the Transportation Master Plan to expand LRT service to all sectors of the City by 2040. The Capital Line South Extension will extend south from Century Park (111 Street at 24 Avenue) along the west side of 111 Street. It will cross Blackmud Creek and Anthony Henday Drive where it will turn west until continuing south again along 127 Street to Ellerslie Road. This report focuses on the development of the LRT bridge and MUT where the alignment crosses Blackmud Creek

The financial, social, environmental, and institutional opportunities and constraints associated with the development of the LRT bridge and MUT were examined as part of the SLS. The proposed location of the new LRT bridge and MUT is the most appropriate site to meet the objectives of the Transportation Master Plan without incurring significant financial costs to the approved alignment. The MUT will maintain trail connectivity within Blackmud Creek, increasing accessibility to this area, and enhancing the social value for Blackmud Creek trail users. The potential impact on the surrounding community residents during construction is a social constraint that will be mitigated through ongoing public communication and participation. The proposed location of the new LRT bridge and MUT is within previously disturbed areas, reducing the impacts on the surrounding natural environment. The proposed development of the LRT bridge and MUT is expected to have low environmental impacts on the identified Valued Ecosystem Components (VECs). The institutional constraints are provided by the federal, provincial and municipal legislative and regulatory structure that must be met for the development of the site.



The proposed LRT bridge and MUT is considered an appropriate development for this location within the North Saskatchewan River valley because it supports achievement of the Transportation Master Plan outcomes related to accessibility and connectivity opportunities.



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The Blackmud Creek Crossing – Site Location Study (SLS) report (Associated Environmental Consultants 2019) was originally reviewed and approved by the City of Edmonton in 2019. The Blackmud Creek Crossing project has now progressed to the Design/Build phase. During technical negotiations, edits to the design of the bridge have been made to account for affordability considerations. The outcome of these discussions has resulted in a bridge design and project footprint that has been narrowed by 4.6 m.

While we do not have detailed design drawings showing the changes, the decreased project footprint is expected to have less impacts on the project valued ecosystem components than the original design. In order for the final design to be compliant with the existing EIA sign off, important environmental considerations will still be adhered to. These include:

- maintaining an appropriate openness ratio for optimal terrestrial movement under the structures by ensuring greater than 3.5 m spacing between the existing 111 Street bridge and the new LRT bridge; and
- ensuring the limits of all construction (including temporary lay down areas) remain above the 1:5 year HWL of Blackmud Creek, and all bridge components remain above the 1:100 year flood event.

The report has been updated from the 2019 version to include updated references and regulatory legislation.

1 INTRODUCTION

On behalf of Capital Line Partners, Associated Environmental Consultants Inc. (Associated), the environmental division of Associated Engineering, was retained by the City of Edmonton (the City) to complete a Site Location Study (SLS) for the proposed development of the Capital Line South Extension Light Rail Transit (LRT) bridge and multi-use trail (MUT) where the alignment crosses Blackmud Creek.

The SLS is required to meet the requirements under the North Saskatchewan River Valley Area Redevelopment Plan, Bylaw 7188 (City of Edmonton 2018). This Bylaw is a comprehensive plan that provides opportunities to manage a major portion of the river valley and ravine system for use as environmental protection areas as well as for urban and natural parks. An important purpose of Bylaw 7188 is to protect the river valley as part of an open-space heritage that provides a recreation-oriented land use system and incorporates formal and informal parks linked through a series of paths, trails, and open spaces.

The SLS is also required to confirm the need for the proposed development within the river valley.



1.1 PROJECT DESCRIPTION

The City's Transportation Master Plan (City of Edmonton 2009) identifies public transit, including LRT, as a key component in shifting Edmonton's transportation system from a car-oriented system to one that emphasizes active and public modes of transportation. The City plans to construct five LRT lines, with the goal of connecting all sectors of the city (i.e., southwest, southeast, northwest, northeast, west and east) to the downtown by 2040. The City believes that expansion of the LRT to all sectors will increase transit ridership and transit mode split, and spur the development of compact, urban communities (City of Edmonton 2009).

The approved Capital Line South Extension will extend south from Century Park (111 Street at 24 Avenue) along the west side of 111 Street. It will cross Blackmud Creek and Anthony Henday Drive where it will turn west until continuing south again along 127 Street to Ellerslie Road. The Heritage Valley Park and Ride Facility, LRT Station, and Operations and Maintenance (O&M) Facility will be located at the south end of the alignment.

This report focuses on the development of the new LRT bridge and MUT where the alignment crosses Blackmud Creek (Figure 1-1). The new bridge will be located on the west side of the two existing roadway bridges that span Blackmud Creek and will have a vertical profile similar to the existing infrastructure. The bridge will accommodate a MUT immediately along its west side. The Project Footprint includes the area that will be directly disturbed for construction, operation, and maintenance of the new bridge and MUT including the project components, the limit of construction and laydown areas. The Project Area for the SLS includes the North Saskatchewan River Valley zone north and south of the proposed bridge location and extends 10 m beyond the limit of construction to the east and west.; the immediate area that will be directly affected by the Capital Line South Extension project.

Blackmud Creek is part of the Whitemud and Blackmud Ravine trail network. This trail network provides opportunities for year-round recreation, including walking, running, cross-country skiing, camping, hiking, snowshoeing, dog walking, nature observation, biking, berry picking and photography. Blackmud Creek meanders through the Whitemud and Blackmud Ravines and is part of the North Saskatchewan River Valley watershed. The area is surrounded by residential development and roadway infrastructure; increasing accessibility to the trail systems within Blackmud Ravine. The area contains riparian habitat and natural vegetation communities as well as high-use wildlife trails.

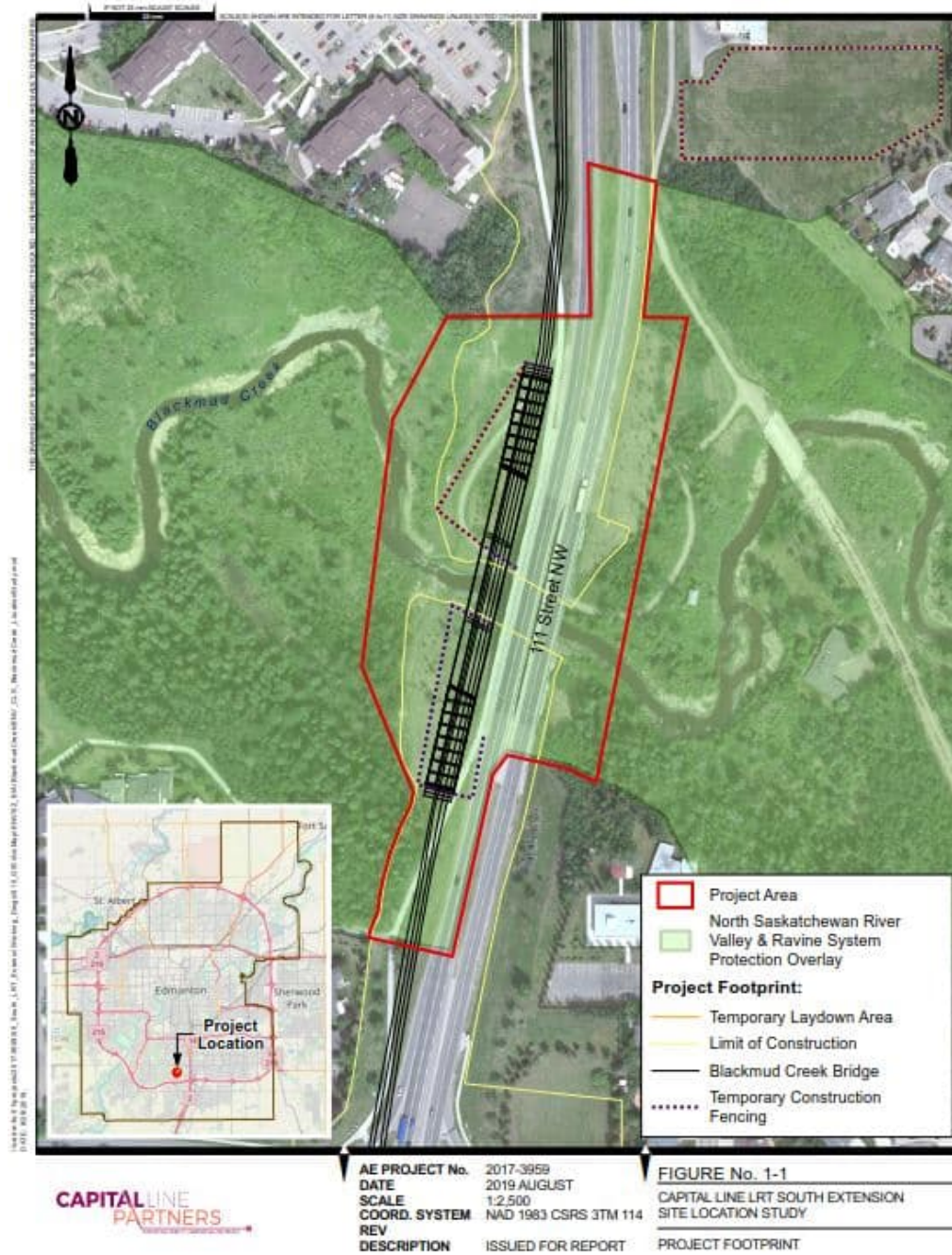


Figure 1-1
 Project Footprint

1.2 PROJECT SCOPE

Preliminary designs and details of the new bridge have been extrapolated from the preliminary design drawings (90% submission issue, Revision 1, 2018) for COE Integrated Infrastructure Services Project: South LRT Extension, Century Park to Ellerslie Road, Contract No. 931770 (Appendix A).

Figure 1-2 shows an artistic rendering of the proposed LRT bridge and MUT.



Figure 1-2
Project Location



2 LOCATION ANALYSIS AND JUSTIFICATION

2.1 ALTERNATIVE LOCATION REVIEW

Due to the location of the proposed south LRT alignment and the existing bridges over Blackmud Creek, there are no other feasible locations for the LRT bridge and MUT without significant disturbance to other areas of the North Saskatchewan River Valley and Ravine System (City of Edmonton 2018).

2.2 RIVER VALLEY DEPENDENCIES

The location of the project, within the North Saskatchewan River valley, is imperative to the Transportation Master Plan to develop an efficient, effective, accessible and integrated LRT network. It is not possible to locate the LRT bridge and MUT, as part of the Capital Line South Extension, outside of the North Saskatchewan River Valley Area Redevelopment Plan boundaries without being in contravention of the guiding principles of Transit-Oriented Development.

2.3 OVERVIEW OF BYLAWS, PLANS, AND POLICIES

The SLS included a review of municipal, provincial, and federal legislation. The proposed site development for the clear-span LRT bridge and MUT will require 4 major permits/approvals:

- Bylaw 7188 – SLS/EIA Approval
- *Water Act – Code of Practice Notification*
- *Environmental Protection and Enhancement Act – Notification*
- *Historical Resources Act – Approval*

Additional information on the regulatory context is provided in the EIA report (Associated Environmental 2019).

Other Acts that typically require permits for watercourse crossing projects that were reviewed for this project but determined not to require submissions to regulatory agencies include:

- *Public Lands Act (work outside of the bed and shore, therefore no disposition/TFA required)*
- *Fisheries Act*

Each of these is discussed in more detail in Section 3.4. Prior to construction, the project should be reviewed to determine if the legislative requirements outlined are still relevant, current, and address any changes that may need to be considered.



3 OPPORTUNITIES AND CONSTRAINTS ANALYSIS

3.1 FINANCIAL OPPORTUNITIES AND CONSTRAINTS

The proposed location of the new LRT bridge and MUT is the most appropriate site to meet the objectives of the Transportation Master Plan without incurring significant costs to the approved alignment. It is not financially feasible to purchase land and implement alternative infrastructure to locate the LRT bridge and MUT outside of the North Saskatchewan River valley.

Although no other locations for the LRT bridge and MUT were feasible, four LRT bridge types were considered which included a concrete arch bridge, a single tower cable stayed bridge, a single arch suspension bridge and a concrete girder bridge (AECOM 2010a). Upon review by the City, the first three options were abandoned based on visual impacts, which were deemed inappropriate for the surroundings, and maintenance concerns.

After this preliminary review, three bridge concepts were presented at public forums and included:

1. A girder bridge carrying the LRT and MUT;
2. A concrete girder bridge carrying the LRT and a separate stressed ribbon bridge for the MUT; and
3. An arch-suspension bridge carrying both the LRT and MUT.

In order to reduce environmental impacts to the Blackmud Creek ravine, the Edmonton Parks Branch indicated a preference for the single bridge concept and therefore Option 2 was eliminated (AECOM 2010a). The remaining options both have an overall length, including abutments of 207.1 m. In order to minimize excavation for girder lines and based on public feedback and cost considerations, Option 1 was chosen (Figure 1-2). For each bridge concept described above, the openness ratio remained the same because only the girder design was changed.

3.2 SOCIAL OPPORTUNITIES AND CONSTRAINTS

Public consultation has played an essential role in shaping the Valley Line LRT. From identification of the corridor in 2009, through the development of the concept plan, to the completion of preliminary design in 2013, public engagement has been a primary focus (City of Edmonton 2009).

The majority (77%) of Edmontonians use personal vehicles for everyday travel (City of Edmonton 2009). Public transit, including LRT, is a key component in shifting from a car-oriented transportation system to an improved system that emphasizes active and public modes of transportation (City of Edmonton 2009). The proposed LRT bridge and MUT will maintain



existing trail connectivity within Blackmud Creek. Accessibility to this area of the city is expected to improve through increased ridership. The development of the LRT bridge and MUT will enhance the social value for trail users in the Whitemud and Blackmud Ravine network.

A notable social constraint will be the potential impacts on the surrounding community residents during construction. Ongoing public communication and engagement will be required to ensure that concerns are identified and addressed.

3.3 ENVIRONMENTAL OPPORTUNITIES AND CONSTRAINTS

The proposed location of the new LRT bridge and MUT will be conducted in a previously disturbed area and the concerns can be easily managed by following best management practices and minimizing disturbance where possible.

The proposed development of the LRT bridge and MUT is expected to have low environmental impacts on the identified Valued Ecosystem Components (VECs):

1. Land use and zoning;
2. Blackmud Creek floodplain and channel hydraulics;
3. Topography and soil;
4. Surface water, groundwater and aquatic habitat;
5. Vegetation;
6. Wildlife and movement corridors; and
7. Historical resources.

The mitigation measures described in the EIA report (Associated 2019) are intended to reduce the short-term impacts of construction activities and minimize longer term residual impacts on the VECs. The key mitigation strategies are summarized as follows:

1. Design all components of the bridge so they are located above the HWL during the 1:100 year flood event.
2. Limits of construction has been established above the 1:5 year HWL of Blackmud Creek and avoids as much tree removal and vegetation clearing as possible.
3. Preliminary engineering designs have minimized the Project Footprint on areas with native and naturalized vegetation including the establishment of one laydown area located of the North Saskatchewan River Valley ARP boundary and the other laydown area overlaps with previously disturbed vegetation communities consisting largely of non-native vegetation species.
4. Restrict construction activities to daytime hours, to avoid potential disruption of coyote and deer movement. This area is an important corridor for coyote and deer and if blocked during construction could disrupt their movement.



5. If vegetation clearing, including trees, is required, all vegetation clearing activities should occur outside of the restricted periods (February 15 to August 31) for migratory birds and other sensitive species such as amphibians.
6. Prior to construction, conduct field verification (nest search) to determine the presence of barn swallows, a threatened species. The Project Area has some characteristics that would provide suitable habitat for barn swallows. Any vegetation clearing should occur outside of sensitive wildlife breeding/nesting periods, February 15 to August 31.
7. Revegetate and restore disturbed areas with native vegetation as quickly as possible after the end of construction activities to reduce the duration of impacts and minimize opportunities for the establishment of invasive plants.
8. Maintenance and fueling will occur at least 30 m from storm / sewer system catch basins and from the top of bank of Blackmud Ravine.
9. Implement an Environmental Construction Operations (ECO) Plan that describes appropriate erosion and sediment control measures to prevent stormwater runoff from eroding sediment and depositing it into Blackmud Creek.

Other mitigation strategies, best management practices and required project plans associated with the crossing are in Section 4 of the EIA (Associated Environmental 2019).

3.4 INSTITUTIONAL OPPORTUNITIES AND CONSTRAINTS

3.4.1 North Saskatchewan River Valley Area Redevelopment Plan, Bylaw 7188

The North Saskatchewan River Valley Area Redevelopment Plan, Bylaw 7188 (City of Edmonton 2018) identifies a boundary for the river valley and ravine system and a set of policies and development approval procedures for lands within this boundary. The Bylaw, adopted in 1985, serves to protect the North Saskatchewan River Valley and Ravine System as part of Edmonton's valuable open space heritage (City of Edmonton 2018):

One of the goals of Bylaw 7188 is to provide a pedestrian movement network, and other non-motorized vehicular networks including the provision of River and Ravine Crossings, throughout the Plan area.

The development of the LRT bridge and MUT conforms to a number of objectives and policies of Bylaw 7188 because it contributes to the transportation needs of the City and the Plan area within and alongside the natural features of the river valley (Table 3-1).

Under Bylaw 7188, all proposals for the development of a "Major Facility" that is publicly owned or is developed on public lands shall be subject to an environmental impact screening assessment, and a SLS detailing costs and social, environmental and institutional constraints, which make a river valley location essential, must be prepared for Council approval. These



studies shall be undertaken prior to Council committing funds for capital expenditure for the development of the proposal (Section 3.5.3 in City of Edmonton 2018).

This report is expected to fulfill the SLS Approval requirement under Bylaw 7188.

Table 3-1
 Relevant Objectives and Policies of Bylaw 7188

Number and Title	Bylaw 7188 Objective/Policy
Objectives	
2.3 Parkland Development Objective	2.3.3 To provide a pedestrian movement network, and other non-motorized vehicular networks including the provision of River and Ravine Crossings, throughout the Plan area.
2.5 Transportation Objectives	2.5.1 To support a transportation system which serves the needs of the City and the Plan area yet is compatible with the parkland development and the environmental protection of the River Valley and its Ravine System.
Policies	
3.2. Parkland Development Policy	3.2.10 Trail System It is the policy of this Plan to establish pedestrian and other non-motorized vehicular movement systems; which includes bicycles, cross-country ski trail developments and equestrian trails in selected areas; as the primary modes of movement along and through the River Valley.
	3.2.11 River and Ravine Crossings It is the policy of this Plan to develop and/or improve River and Ravine crossings for pedestrians and other non-motorized movement systems so as to connect recreational activity nodes and other park amenities.
3.3 Environmental Protection Policy	3.3.3 To ensure the application of an environmental impact screening and assessment to all proposed public development and development on public land.
3.4 Transportation Policies	3.4.1 Direct River and Direct Ravine Crossings by Major Transportation Corridors It is the policy of this Plan that new transportation corridors will not be approved except for direct River and direct Ravine crossings which are deemed essential and approved by City Council as in Policy 3.5.3.



Number and Title	Bylaw 7188 Objective/Policy
	<p>3.4.2 Negative Impacts of Existing and Future Transportation Facilities It is the policy of this Plan that existing and future transportation facilities will be reviewed with the objective to eliminate, minimize or mitigate the negative effects of the facilities through design and landscaping measures.</p>
	<p>3.4.3 Environmental Impact Assessment for Transportation Facility Proposals It is the policy of this Plan that proposals for the upgrading of approved transportation corridors and attendant facilities be subject to an environmental impact screening assessment (Schedule D) and that the identified adverse impacts be eliminated, minimized or mitigated through design and landscaping measures.</p>
<p>3.5 Major Facility and Natural Resource Development Policy</p>	<p>3.5.1 It is a policy of this Plan that major public facilities shall not be constructed or expanded unless their location within the River Valley is deemed essential and approved by the City Council.</p>
	<p>3.5.3 It is a policy of this Plan that all proposals for the development of a major facility that is publicly owned or is developed on public lands shall be subject to an environmental impact screening assessment as outlined in Schedule D, and a detailed site location study detailing costs, and social, environmental and institutional constraints which make a River Valley location essential must be prepared for Council approval. These studies shall be undertaken prior to Council committing funds for capital expenditure for the development of this proposal.</p>



3.4.3 Water Act

Work in or near a waterbody, including wetlands, is regulated under the provincial *Water Act* (R.S.A. 2000, C. W-3) and watercourse crossings, including bridges, are addressed under the Act's *Code of Practice for Watercourse Crossings* (Alberta Environment and Parks 2019). Blackmud Creek is a mapped Class C waterbody on the Alberta Code of Practice 1:500,000 St. Paul Management Area Map and has a restricted activity period of April 16 to June 30 (AESRD 2012). Under the Code of Practice, the new LRT bridge is considered a Type 1 crossing, as it is a single span (clear span) bridge, which does not have abutments that are placed within the bed or within the active channel of a water body (Alberta Environment and Parks 2019). Therefore, installation can be completed at anytime of year and does not require recommendations from a qualified aquatic environment specialist (Alberta Environment and Parks 2019). A Code of Practice Notification under the *Water Act* needs to be submitted no less than 14 days prior to the work commencing. A Public Notification (i.e., local newspapers advertisement) may be required as part of the application process.

Dewatering activities may require an Approval under this Act if the dewatering occurs for a duration greater than 6 months. However, it is anticipated that the footings of the piers will be constructed through drilling and, therefore, dewatering will not be required.

3.4.4 Environmental Protection and Enhancement Act

The provincial *Environmental Protection and Enhancement Act* (EPEA) (R.S.A. 2000, c. E-12) supports and promotes the protection, enhancement, and wise use of the environment and is administered by Alberta Environment and Parks. The EPEA regulates some municipal infrastructure systems, such as stormwater drainage, wastewater systems, and potable water systems.

The new bridge construction will connect to the existing system which outfalls directly to Blackmud Creek. Sewers will have to be realigned to avoid interfering with abutments, which involves the installation of two new manholes west of the LRT alignment. The new bridge construction will parallel the existing bridge drainage. Since there will be an addition to the existing system, notification under the *Wastewater and Storm Drainage Regulation* established under EPEA (Alberta Regulation 119/1993) will be required. Under subsection 6(1) of the Regulation, extension and replacement of wastewater or stormwater collection systems require a notification to undertake the extension or replacement. Notification will require coordination with EPCOR Drainage Services.



3.4.5 Historical Resources Act

Archaeological and paleontological resources are regulated under the provincial *Historical Resources Act* (R.S.A. 2000, C. H-9). The Project Area is within an area that has a high potential for archeological resources (Historical Resource Value: 5, archaeological and palaeontological) and, as a result, requires Clearance from Alberta Culture and Tourism (ACT).

An application for site clearance was made with ACT and Approval was granted on August 11, 2009 (Appendix B). A Historical Resources Impact Assessment (HRIA) was not required.

3.4.6 Other Relevant Policies and Plans

The following subsections describe local bylaws, plans, and policies aligned with the EIA. These local documents do not require permits/approvals, but they are discussed in this Institutional Constraints section to illustrate an overall cognizance with the development of the clear-span LRT bridge and MUT.

3.4.7 Public Lands Act

Crown land, including the bed and shore of permanent and naturally occurring waterbodies, is regulated under the *Public Lands Act* (R.S.A. 2000, C. P-40); permanent occupation of Crown land typically requires a disposition¹.

The new Capital Line South Extension LRT crossing over Blackmud Creek is not anticipated to require a disposition, because it is a clear span bridge and will not occupy the “bed and shore” of Blackmud Creek; in other words, as long as the piers are outside of the ordinary water mark, a disposition is not required.

3.4.8 Drainage Bylaw – Bylaw 18093

The purpose of Bylaw 18093 is to regulate surface drainage on public and private land and foster the well-being of the environment by prohibiting release of dangerous or hazardous materials into the sewerage system (City of Edmonton 2024a).

Releases of water into storm sewers and watercourses must adhere to the requirements for restricted wastes in Schedule B of this Bylaw. Oil and grit separators will be installed in the storm pipe system on the north and south ends of the bridge, upstream of existing outfalls, for water quality control during operation. Mitigation measures including erosion and sediment controls

¹ A disposition was in place beside the future Capital Line crossing, for existing 111 Street crossing and outfall; the 111 Street crossing disposition was cancelled on January 15, 2019 (DLO930764).



are to be incorporated into the ECO Plan to maintain compliance with this Bylaw during the construction phase of the project.

3.4.9 EPCOR Drainage Services Bylaw 18100

The purpose of Bylaw 18100 is to approve the terms and conditions for drainage services and a mechanism whereby Drainage Services Guidelines may be implemented by EPCOR Water Services Inc. (City of Edmonton 2024b).

Any releases of water into sanitary and combined sewers or into storm sewers and watercourses must adhere to the terms and conditions related to restricted wastes in Appendix B and C of this Bylaw, respectively.

3.4.10 Corporate Tree Management Policy C456C

The Corporate Tree Management Policy C456C protects the tree canopy in the City from destruction, loss, or damage. Where protection of trees is not possible, the Urban Forestry Department determines the financial value of the trees to be removed based on size and species (City of Edmonton 2019, 2020).

The City's Urban Forestry Department is to be contacted a minimum of four weeks prior to construction to review construction plans and tree protection. Any trees marked for removal to accommodate project work will be coordinated through Urban Forestry including a monetary fee for removal and compensation.

3.4.11 Community Standards Bylaw, Bylaw 14600

The Community Standards Bylaw, Bylaw 14600 (City of Edmonton 2023) regulates noise in the City. The Bylaw restricts construction activity to between 7 a.m. and 9 p.m. on any day other than Sunday or a holiday and between 9 a.m. and 7 p.m. on Sunday or a holiday.

3.4.12 Parkland Bylaw, Bylaw 2202

This Bylaw regulates the conduct and activities of people on Parkland in order to promote the safe, enjoyable and reasonable use of such property and to protect and preserve natural ecosystems for the benefit of all citizens of the City.

The contractor shall be responsible for obtaining any permits for activities occurring in Parkland areas that are not covered by another Bylaw.



3.4.13 Wildlife Act

The *Wildlife Act* (R.S.A. 2000, c. W-10) prohibits the willful molestation, disruption, or destruction of wildlife, or a house, nest, or den of wildlife.

The Project Area falls within two sensitive wildlife zones, the sensitive raptors (bald eagle) and sharp-tailed grouse zones (Government of Alberta 2015).

If bird surveys are required as part of construction mitigation activities, or if any animal relocation is planned, a permit under this Act will be required and must be obtained by a qualified environmental professional (Research Permit/Collection Licence).

3.4.14 Fisheries (Alberta) Act

Handling, capturing, or relocating fish is regulated under the *Fisheries (Alberta) Act* (R.S.A. 2000, c. F-16). For this project, no instream work is required and therefore the need to handle fish does not apply. If the project scope changes, a fish salvage may be required. Prior to the fish salvage, the fisheries biologist completing the salvage will need to obtain a Fish Research Licence under this Act. This work needs to be performed by a qualified individual with a project-specific Fish Research Licence.

3.4.15 Fisheries Act

Fish and fish habitat are regulated under the *Fisheries Act* (R.S.C., 1985, c. F-14), which is administered by Fisheries and Oceans Canada (DFO). The *Fisheries Act* prohibits causing harmful alteration, disruption, or destruction of fish habitat (HADD) and causing the death of fish under sections 35(1) and 34.4(1), respectively.

Projects requiring in-water works that may cause HADD or the death of fish must submit a Request for Review (RfR) to DFO, if code of practices do not apply. DFO will determine if the Project can proceed under a Letter of Advice or if Authorization is required.

DFO also has Codes of Practice in place for routine and low impact works, including construction of clear span bridges (i.e. Code of Practice: Clear Span Bridges). The DB contractor is responsible for determining the applicability of this Code of Practice and completing necessary submissions as required.



3.4.16 Canadian Navigable Water Act

The *Canadian Navigable Waters Act* (R.S.C. 1985, C. N-22) protects navigable waters and the public's right to travel on them. The Act can apply to anyone who is an owner of the works on navigable waters, interfering with navigation in Canadian Navigable Waters and/or planning something that affect navigation in navigable waters.

The DB contractor is responsible for determining the applicability of this Act and will be required to obtain approval, if required.

3.4.17 Migratory Birds Convention Act, 1994

The *Migratory Birds Convention Act, 1994* (S.C. 1994, c. 22) protects migratory birds, their eggs, and their nests. Any project activities that may impact migratory birds, their eggs, or nests, should be reviewed and appropriate mitigation implemented. All clearing and stripping activities have potential to disturb migratory and non-migratory birds. Disturbance to active migratory bird nests is prohibited by the federal *Migratory Birds Convention Act*, as is disturbance to active non-migratory bird nests protected by the provincial *Wildlife Act*. Timing constraints are further discussed in the EIA (Associated Environmental 2019).

3.4.18 Migratory Birds Regulations, 2022

The *Migratory Birds Regulations, 2022* (MBR 2022) (SOR/2022-105) provides protection to bird nests when they are considered to have a high conservation value for migratory birds. Effective July 30th, 2022, under the MBR 2022 it is now prohibited to damage, destroy, disturb, or remove migratory bird nests when they contain a live bird or a viable egg. There are 18 species of birds identified on Schedule 1, whose nests now have year-round nest protection, unless they have been shown to be abandoned. Table 3-2 below identifies which of these species may occur within the Edmonton area.

Table 3-2
 Schedule 1 Species That May Occur Within the Edmonton Area

Scientific Name	Common Name
<i>Ardea herodias</i>	Great Blue Heron
<i>Nycticorax nycticorax</i>	Black-crowned Night Heron
<i>Dryocopus pileatus</i>	Pileated Woodpecker



3.4.19 Species at Risk Act

Activities with potential to impact a species at risk or species of concern and/or their habitat are regulated under the *Species at Risk Act* (SARA) (S.C. 2002, c. 29).

A permit will be required if any species at risk listed in Schedule 1 of SARA may be handled during project construction.

3.4.20 Weed Control Act

The *Weed Control Act* (R.S.A., 2008, c. W-5.1) regulates weed species listed in Schedule 1 (prohibited noxious) and Schedule 2 (noxious) of the Act. Project activities must destroy weeds listed in Schedule 1, and control or prevent the spread of weeds listed in Schedule 2.



4 CONCLUSIONS

This SLS was prepared for the City of Edmonton to examine the financial, social, environmental, and institutional opportunities and constraints associated with the development of the clear-span LRT bridge and MUT, to meet the North Saskatchewan River Valley Area Redevelopment Plan, Bylaw 7188 (City of Edmonton 2018) goals and policies.

The project is expected to have low environmental impacts since it will be conducted in a previously disturbed area and the concerns can be easily managed by following best management practices and minimizing disturbance where possible.



Closure

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 practicing under similar conditions. No other warranty expressed or implied is made.

Respectfully submitted,
Associated Engineering Alberta Ltd.

A handwritten signature in black ink, appearing to be "S. Card".

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A handwritten signature in blue ink, appearing to be "S. Meidinger".

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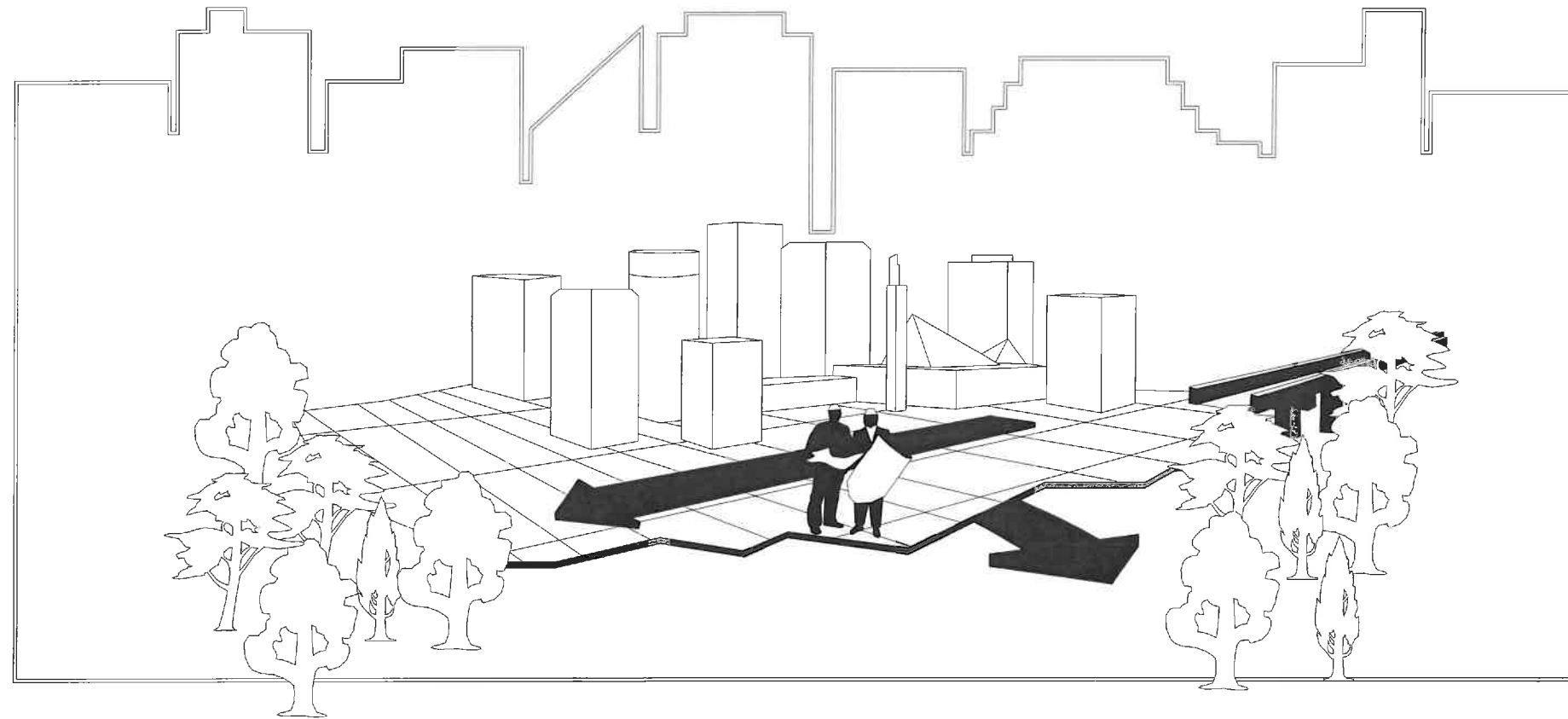
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Appendix A – Preliminary Design Drawings

THE CITY OF
Edmonton CAPITAL
CONSTRUCTION
LRT EXPANSION BRANCH



SOUTH LRT EXTENSION
CENTURY PARK TO ELLERSLIE ROAD

DIRECTOR, SPECIAL PROJECTS
LRT DELIVERY | INTEGRATED INFRASTRUCTURE SERVICES

DATE

CONTRACT No. D931770

CAPITAL LINE
PARTNERS
INTEGRATING MOBILITY, COMMUNITIES AND PEOPLE

**CROSSING AT
BLACKMUD CREEK
90% SUBMISSION TO
CLIENT - 2018OCT22**

**PRELIMINARY DESIGN
NOT FOR CONSTRUCTION**

DRAWING STANDARDS LEGEND

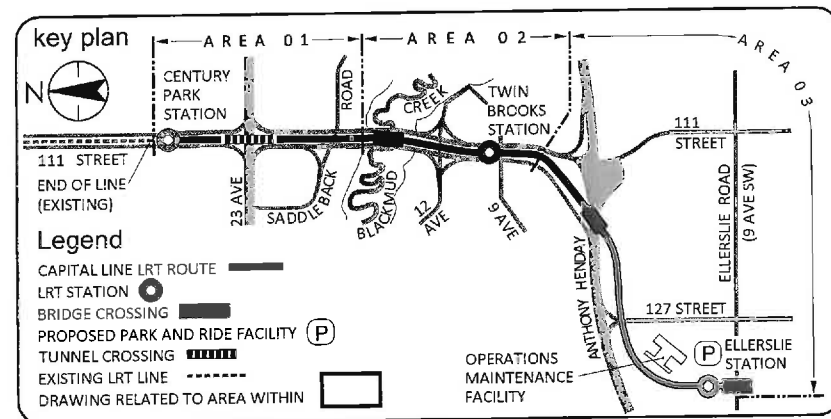
PROJECT NAME

SOUTH LRT EXTENSION - CENTURY PARK TO ELLERSLIE ROAD

LOCATION

THE CITY OF EDMONTON

KEY PLAN



THE KEY PLAN (EXAMPLE SHOWN ABOVE) ON EACH DRAWING SHEET PROVIDES TWO IMPORTANT ITEMS OF INFORMATION

1. THE AREA WHICH IS APPLICABLE TO THE DRAWING. PRIMARILY FOR DRAWING SET NAVIGATION PURPOSES, THE PROPOSED OVERALL SITE BOUNDARY IS DIVIDED INTO THREE (3) AREAS

AREA 01
AREA 02
AREA 03

- THE AREA DESIGNATOR IS REPRESENTED IN THE FIRST TWO (2) NUMBERS OF THE CONSULTANT DRAWING NUMBER
- WHEN A DRAWING APPLIES TO ALL AREAS (01, 02, AND 03), THE PREFIX "00" IS USED

2. A MARKER IDENTIFYING THE LOCATION (APPROX) OF THE AREA SHOWN ON THE DRAWING (WHEN IT APPLIES)

- GREEN RECTANGLE MARKER:

DRAWING NUMBERING SYSTEM

DRAWING NUMBER LEGEND

AREA	DISCIPLINE DESIGNATOR LEVEL 1	DISCIPLINE DESIGNATOR LEVEL 2	DISCIPLINE NUMBER SERIES	SEQUENTIAL NUMBER (1-999)
00	D	D	1	001

EXAMPLE: 00 - DD - 1001

DISCIPLINE DESIGNATOR DESCRIPTORS

DISCIPLINE TYPE	DISCIPLINE DESIGNATOR LEVEL 1	DISCIPLINE DESIGNATOR LEVEL 2	DESCRIPTION
ARCHITECTURE	A	AD	ARCHITECTURE DEMOLITION
		AE	ARCHITECTURE ELECTRICAL
CIVIL	C	CD	CIVIL DEMOLITION
		CG	CIVIL GRADING
		CI	CIVIL IMPROVEMENTS
		CP	CIVIL PAVING
		CS	CIVIL SITE
		CT	CIVIL TRANSPORTATION
		CU	CIVIL UTILITIES
DRAINAGE	D		
ELECTRICAL	E	EL	ELECTRICAL LIGHTING
		EP	ELECTRICAL POWER
		ET	ELECTRICAL TRACTION POWER
		EC	ELECTRICAL CATENARY
		EU	ELECTRICAL UNDERGROUND
		ER	ELECTRICAL RIGHT OF WAY
		ES	ELECTRICAL SIGNALS
GENERAL	G		
LANDSCAPE	L	LP	LANDSCAPE PLANTING
		LR	LANDSCAPE TREE REMOVAL AND RELOCATION
MECHANICAL	M	MH	MECHANICAL HVAC
		MF	MECHANICAL FIRE PROTECTION
		MP	MECHANICAL PLUMBING & PIPING
ROADS	R	RD	ROADS DEMOLITION
		RT	ROADS TRAFFIC ACCOMMODATION
		RM	ROADS MARKING
STRUCTURAL	S		

DISCIPLINE NUMBER SERIES

1	GENERAL (COVER SHEET, DRAWING INDEX, STANDARDS LEGEND)
9	TRACK AND INTEGRATED SYSTEMS
10	TRACTION POWER SUBSTATIONS & CATENARY
11	OPERATIONS AND MAINTENANCE (O&M) AND OPERATIONS CONTROL CENTRE
12	STRUCTURES
13	ROADWAYS, CYCLIST AND PEDESTRIAN
15	DRAINAGE
16	LRT STATIONS
17	TRANSIT CENTRES / PARK AND RIDES
18	LANDSCAPE
19	UTILITIES
21	GEOTECHNICAL

**PRELIMINARY DESIGN
NOT FOR CONSTRUCTION**

DRAWING INDEX

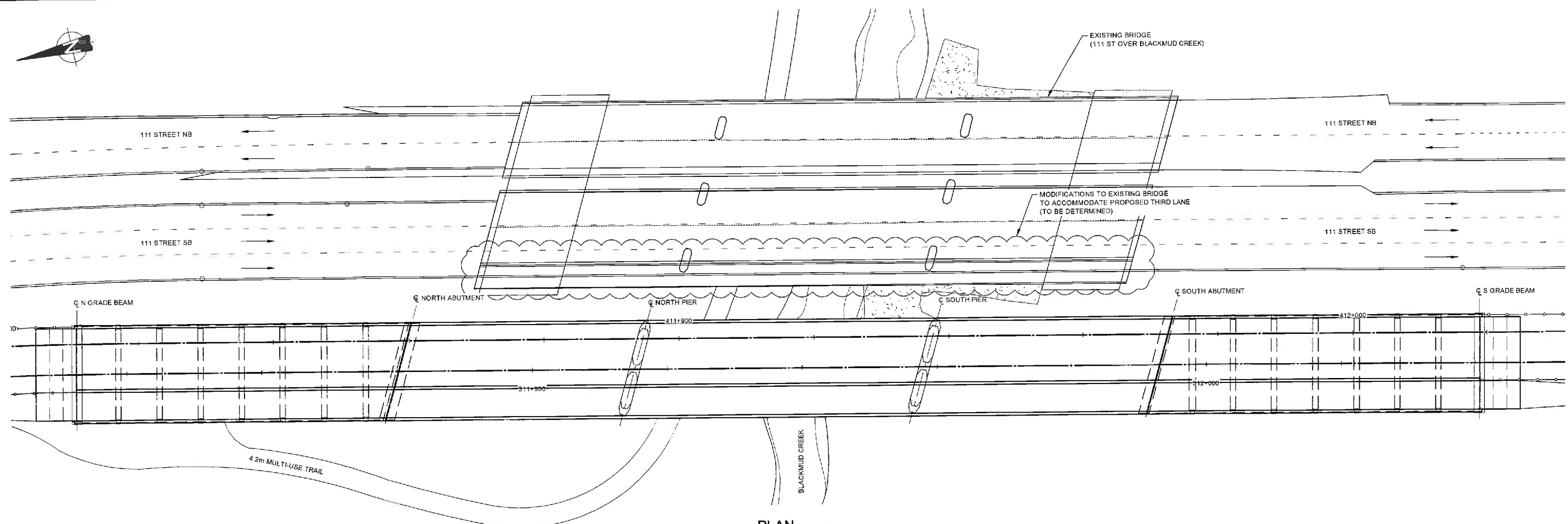
PROJECT NAME
LOCATION

SOUTH LRT EXTENSION - CENTURY PARK TO ELLERSLIE ROAD
THE CITY OF EDMONTON

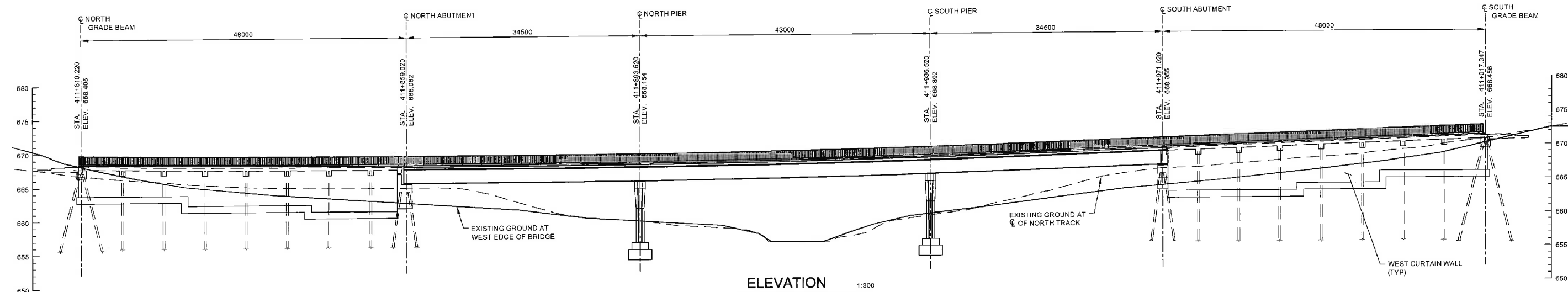
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CITY	CONSULTANT	LINE 1	LINE 2	CITY	CONSULTANT	LINE 1	LINE 2	CITY	CONSULTANT	LINE 1	LINE 2
1000 GENERAL				12000 STRUCTURES							
	00-G-1043	COVER SHEET		BRIDGE							
	00-G-1044	DRAWING STANDARDS LEGEND		02-S-12201		111 STREET AT BLACKMUD CREEK	GENERAL ARRANGEMENT				
	00-G-1045	DRAWING INDEX		02-S-12202		111 STREET AT BLACKMUD CREEK	SITE PLAN				
				02-S-12203		111 STREET AT BLACKMUD CREEK	SOUTH ABUTMENT SHEET 1				
				02-S-12204		111 STREET AT BLACKMUD CREEK	SOUTH ABUTMENT SHEET 2				
				02-S-12205		111 STREET AT BLACKMUD CREEK	NORTH ABUTMENT SHEET 1				
				02-S-12206		111 STREET AT BLACKMUD CREEK	NORTH ABUTMENT SHEET 2				
				02-S-12207		111 STREET AT BLACKMUD CREEK	PIERS				
				02-S-12208		111 STREET AT BLACKMUD CREEK	DECK - SHEET 1				
				02-S-12209		111 STREET AT BLACKMUD CREEK	DECK - SHEET 2				
				02-S-12210		111 STREET AT BLACKMUD CREEK	TRANSITION SLAB				

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**PRELIMINARY DESIGN
NOT FOR CONSTRUCTION**



PLAN 1:300



ELEVATION 1:300

NOTE:
STATIONS AND ELEVATIONS ARE GIVEN AT
CL NORTH TRACK AND SHALL BE ADJUSTED
TO OBTAIN THE CORRESPONDING ELEVATION
AT CL SOUTH TRACK

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consultant

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**PRELIMINARY DESIGN
NOT FOR CONSTRUCTION**

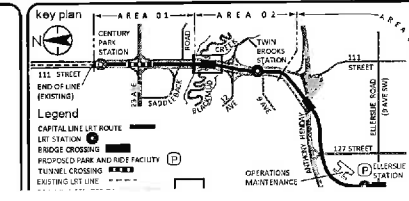
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city of edmonton project no

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client

CAPITAL CONSTRUCTION
LRT EXPANSION BRANCH

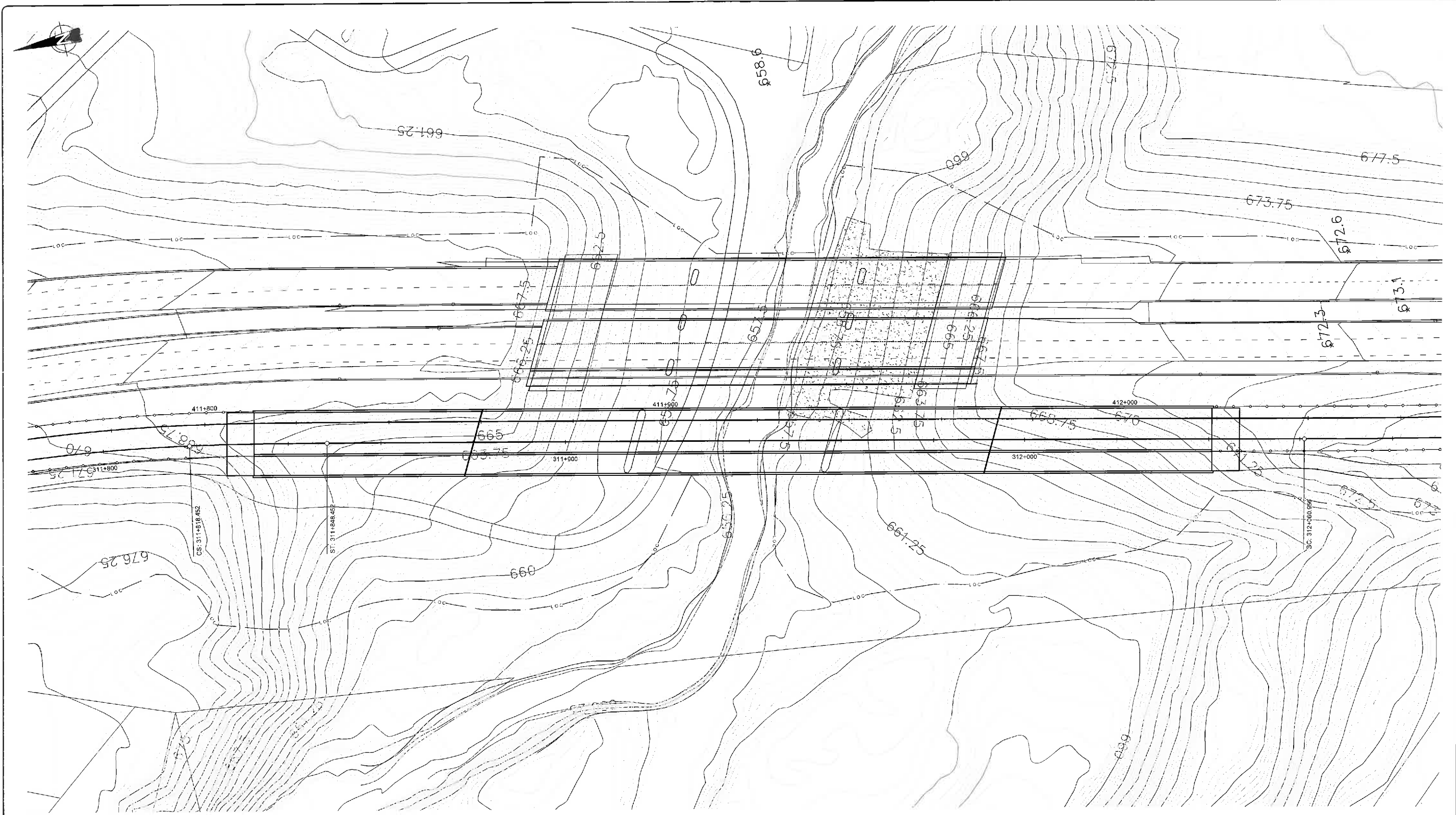
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CIVIL STRUCTURES

project

**SOUTH LRT
EXTENSION**

SOUTH LRT EXTENSION
CENTURY PARK TO
ELLERSLIE ROAD
EDMONTON, ALBERTA

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PLAN 1:400
 SITE PLAN

consultant

CAPITAL LINE PARTNERS

WE TAKE PROGRESS TO THE NEXT LEVEL

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**PRELIMINARY DESIGN
 NOT FOR CONSTRUCTION**

scale horizontal AS SHOWN
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key plan

Legend
 CAPITAL LINE LRT ROUTE
 LRT STATION
 PROPOSED PARK AND RIDE FACILITY
 TRANSFER CROSSING
 EXISTING LRT LINE

client

THE CITY OF **Edmonton** CAPITAL CONSTRUCTION
 LRT EXPANSION BRANCH

drawing title

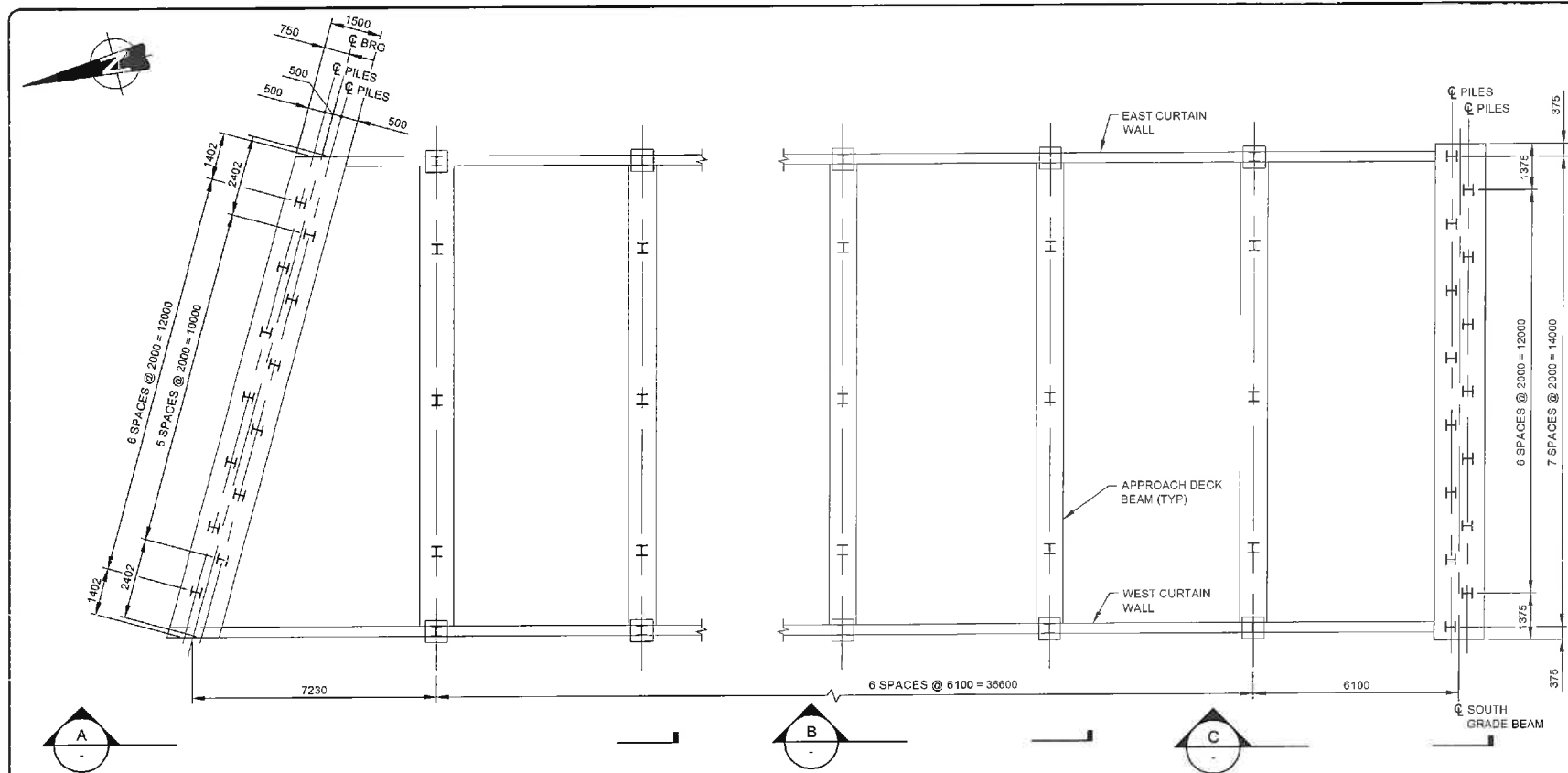
CIVIL STRUCTURES

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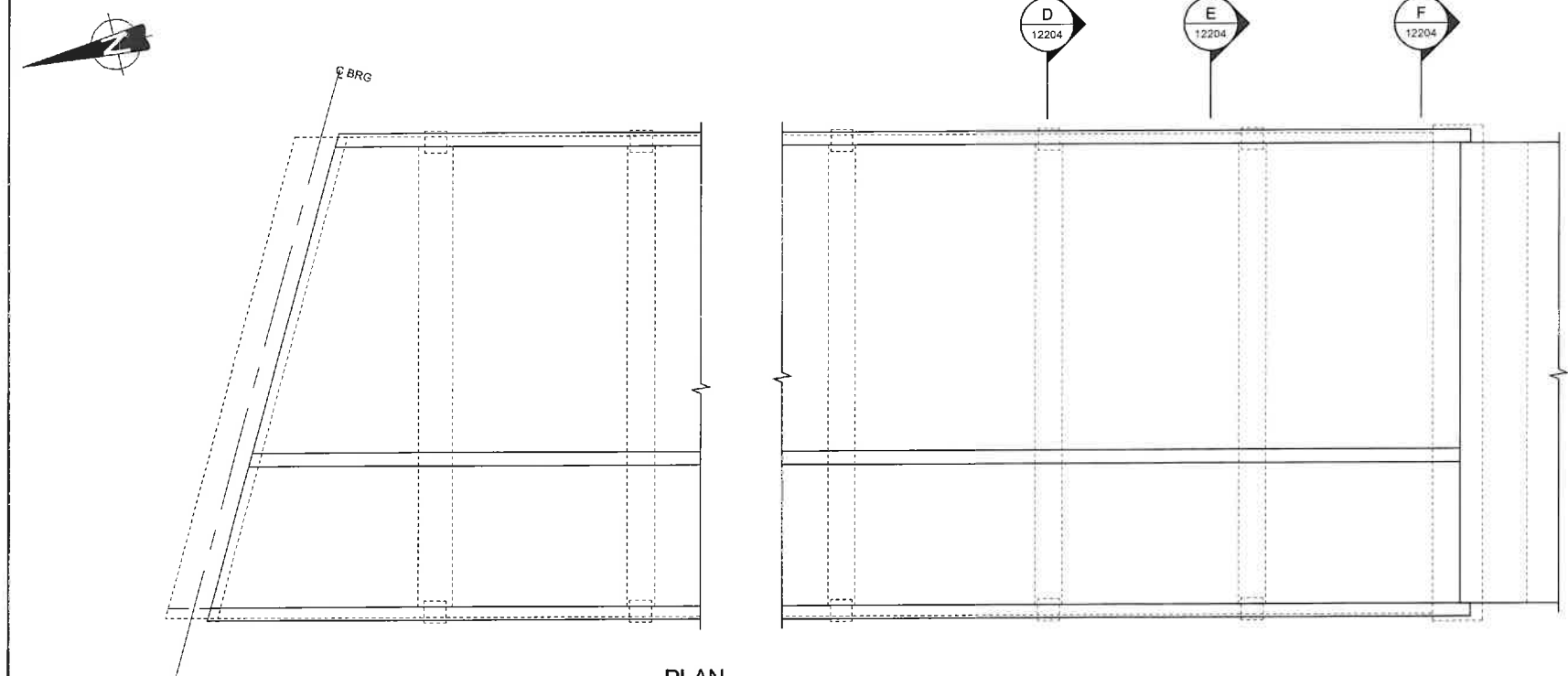
SOUTH LRT EXTENSION

SOUTH LRT EXTENSION
 CENTURY PARK TO
 ELLERSLIE ROAD
 EDMONTON, ALBERTA

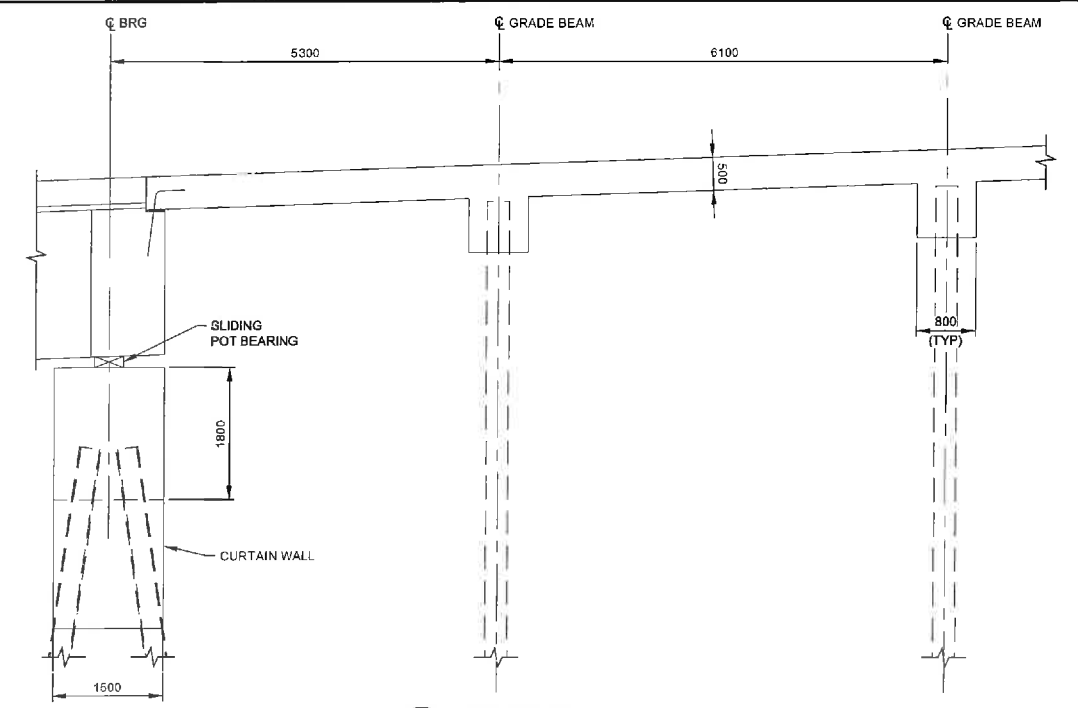
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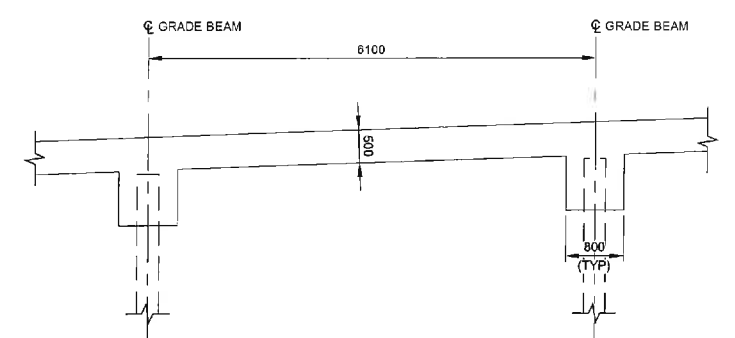
PLAN 1:100
 SOUTH ABUTMENT FOUNDATION



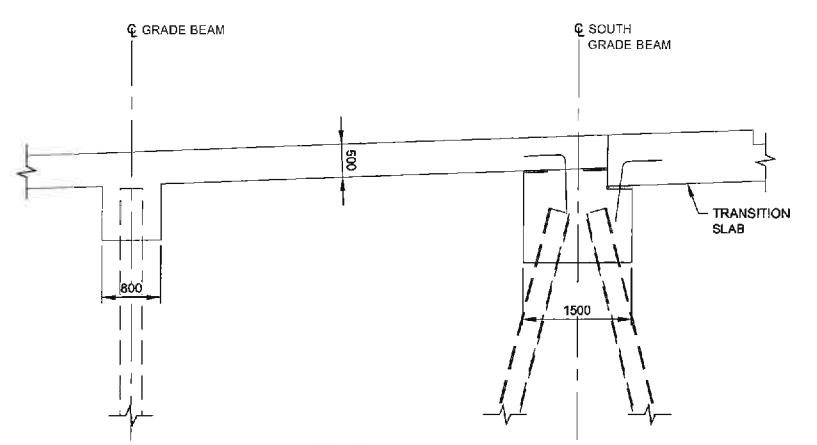
PLAN 1:100
 SOUTH ABUTMENT
 (TRANSITION SLAB NOT SHOWN)



SECTION A 1:50
 ABUT SEAT



SECTION B 1:50
 TYPICAL BEAM



SECTION C 1:50
 GRADE BEAM

consultant

MEMBERSHIP OF CIVIL ENGINEERS AND ARCHITECTS

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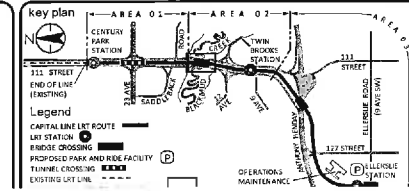
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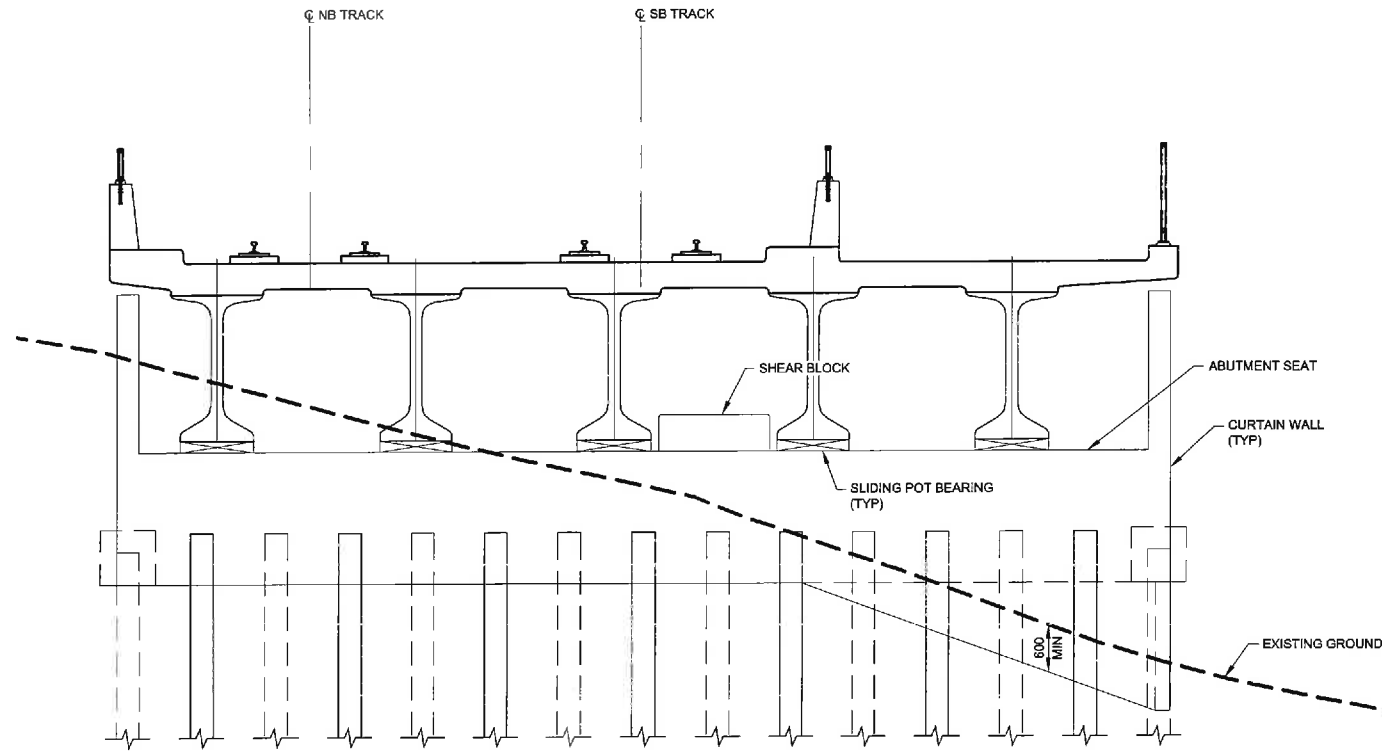
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drawing title CIVIL STRUCTURES

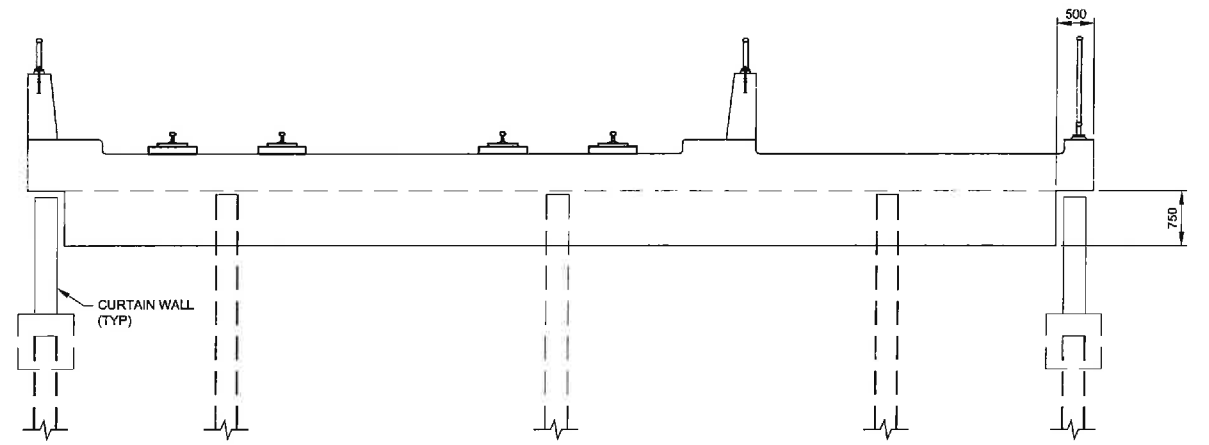
project SOUTH LRT EXTENSION

SOUTH LRT EXTENSION
 CENTURY PARK TO
 ELLERSLIE ROAD
 EDMONTON, ALBERTA

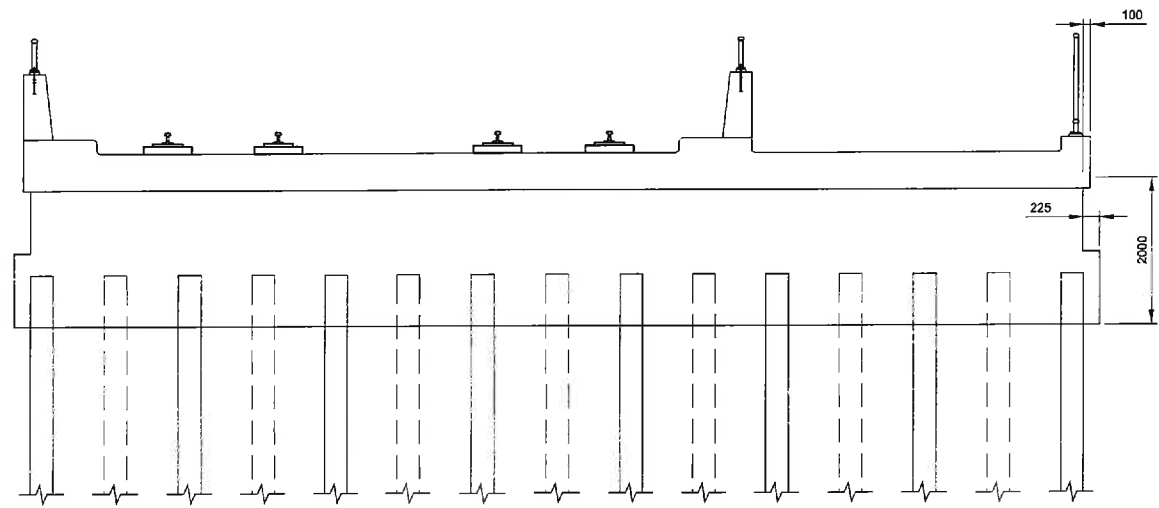
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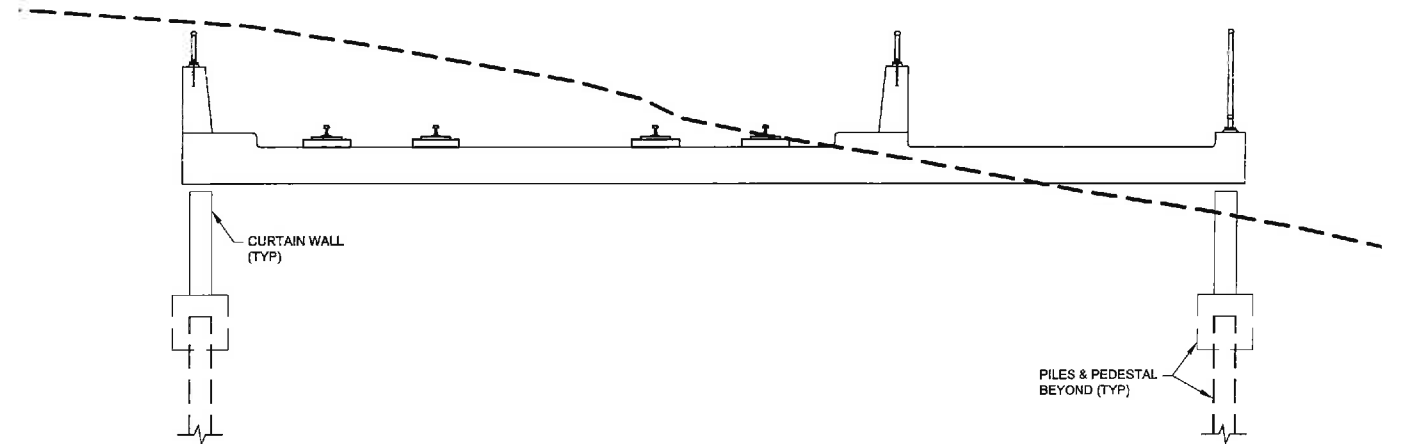
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 ABUTMENT SEAT ELEVATION
 FACING SOUTH



D SECTION 1:50
 12203 AT CENTER OF TRANSVERSE BEAM
 FACING SOUTH



F SECTION 1:50
 12203 SOUTH GRADE BEAM
 FACING SOUTH



E SECTION 1:50
 12203 BETWEEN TRANSVERSE BEAMS
 FACING SOUTH

consultant

CAPITAL LINE PARTNERS

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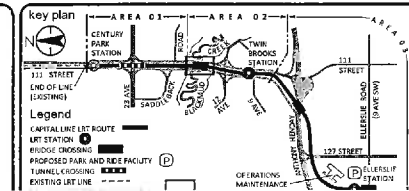
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THE CITY OF **Edmonton** CAPITAL CONSTRUCTION

LRT EXPANSION BRANCH

drawing title

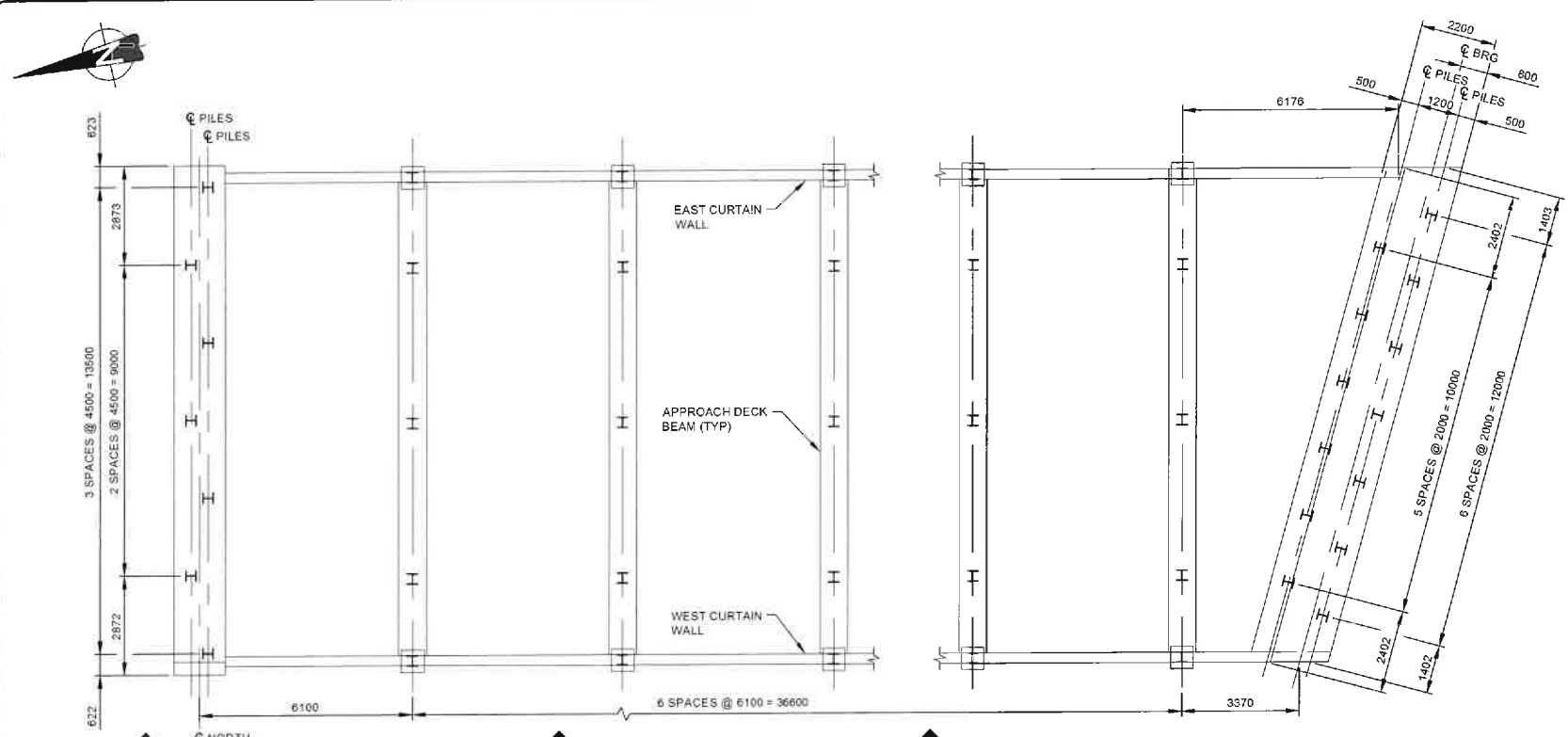
CIVIL STRUCTURES

BRIDGE

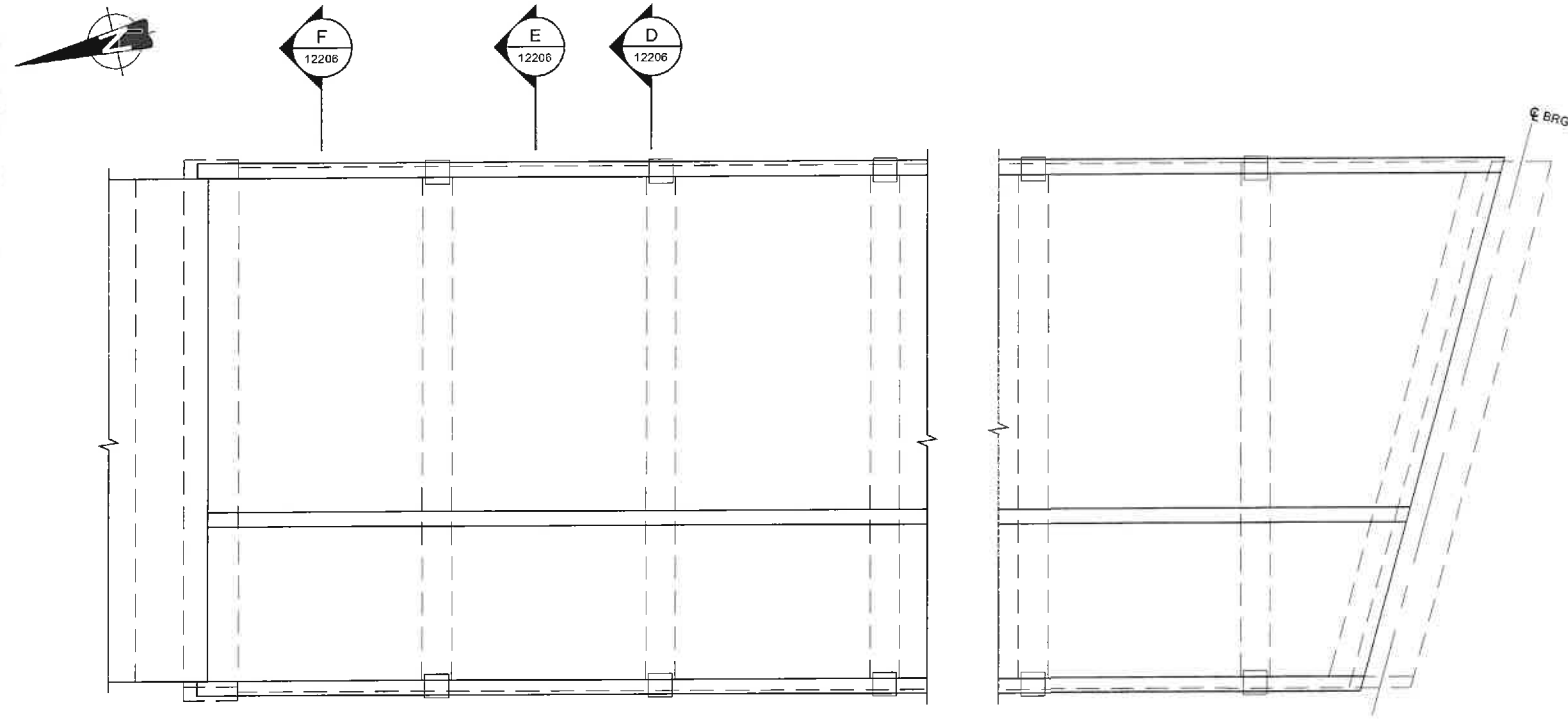
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SOUTH LRT EXTENSION

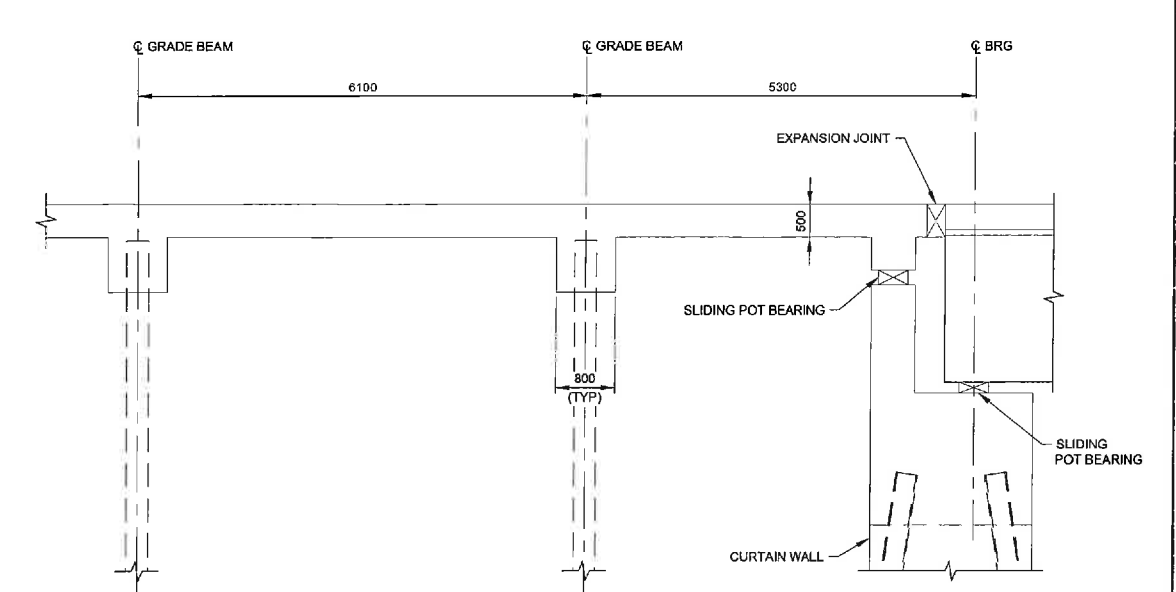
SOUTH LRT EXTENSION
 CENTURY PARK TO
 ELLERSLIE ROAD
 EDMONTON, ALBERTA



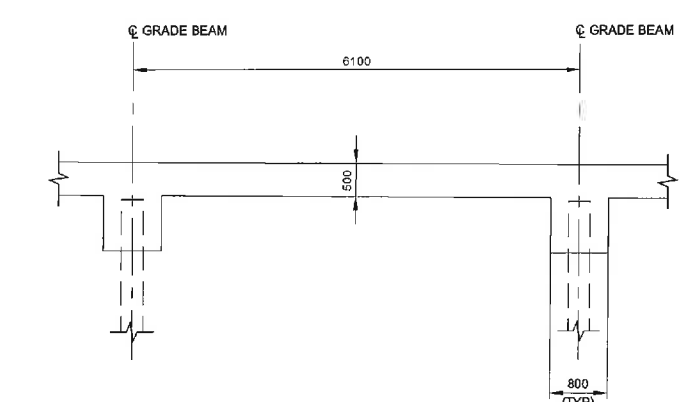
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1:100



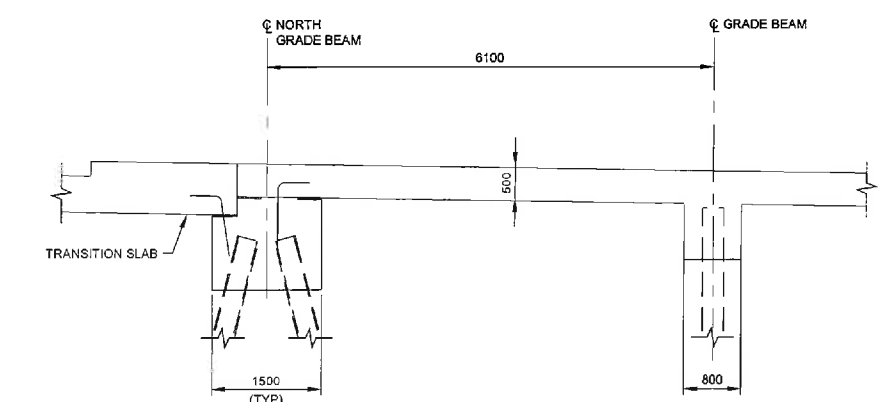
PLAN
NORTH ABUTMENT
1:100



A SECTION
ABUT SEAT
1:50



B SECTION
TYPICAL BEAM
1:50



C SECTION
GRADE BEAM
1:50

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consultant

VERIFIED GENERAL CONTRACTOR

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**PRELIMINARY DESIGN
NOT FOR CONSTRUCTION**

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THE CITY OF EDMONTON
LRT EXPANSION BRANCH

client CAPITAL CONSTRUCTION

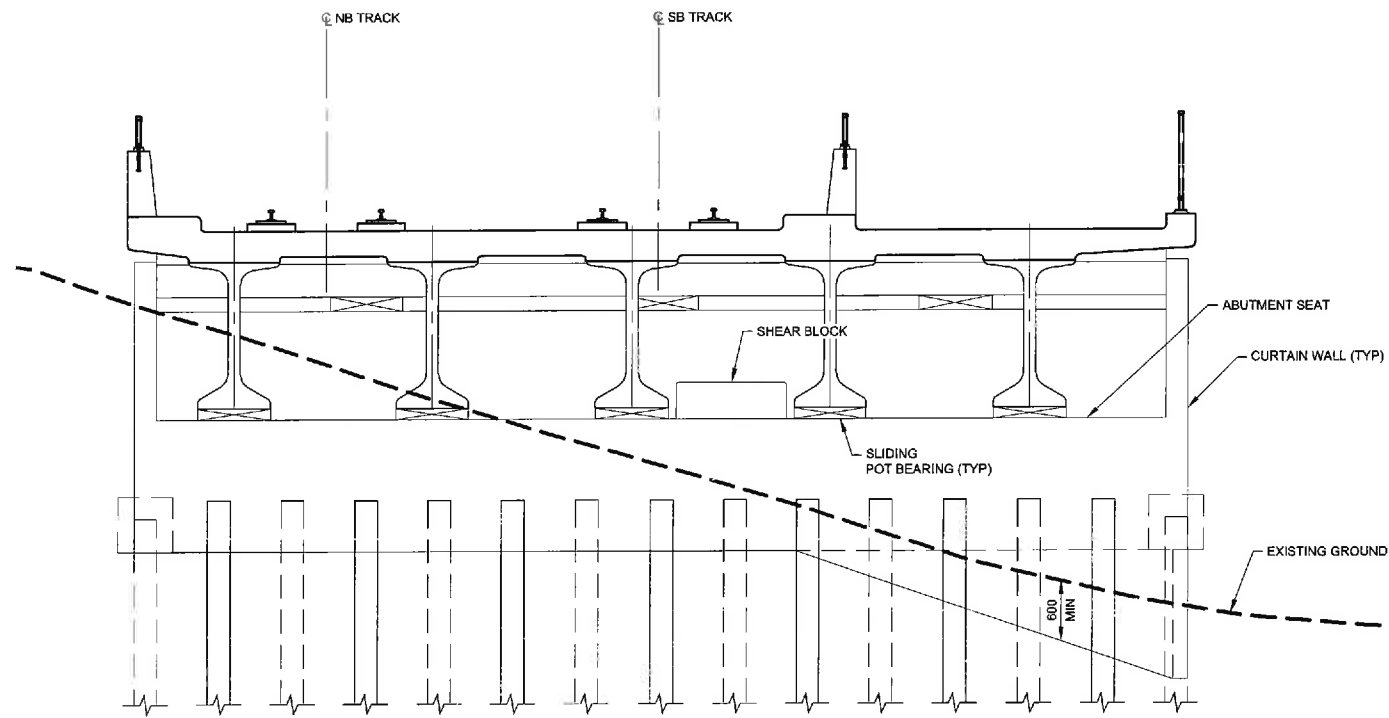
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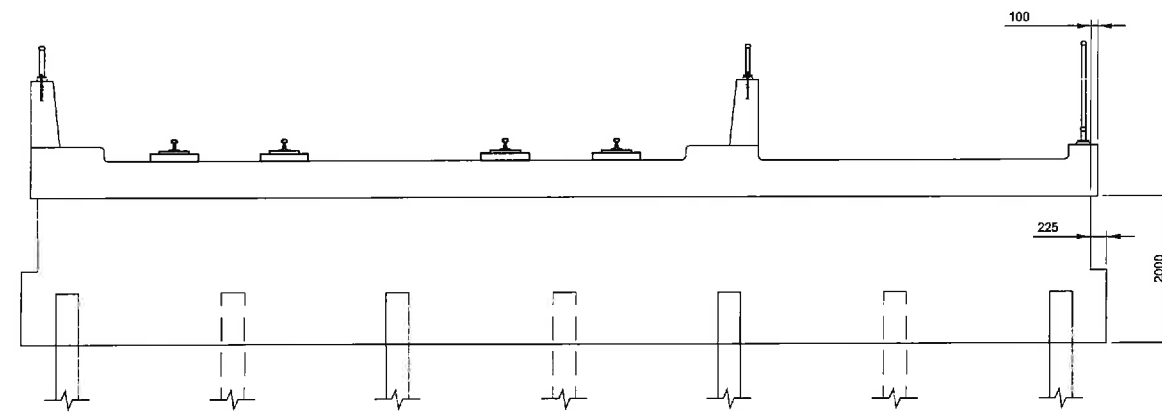
SOUTH LRT EXTENSION

SOUTH LRT EXTENSION
CENTURY PARK TO
ELLERSLIE ROAD
EDMONTON, ALBERTA

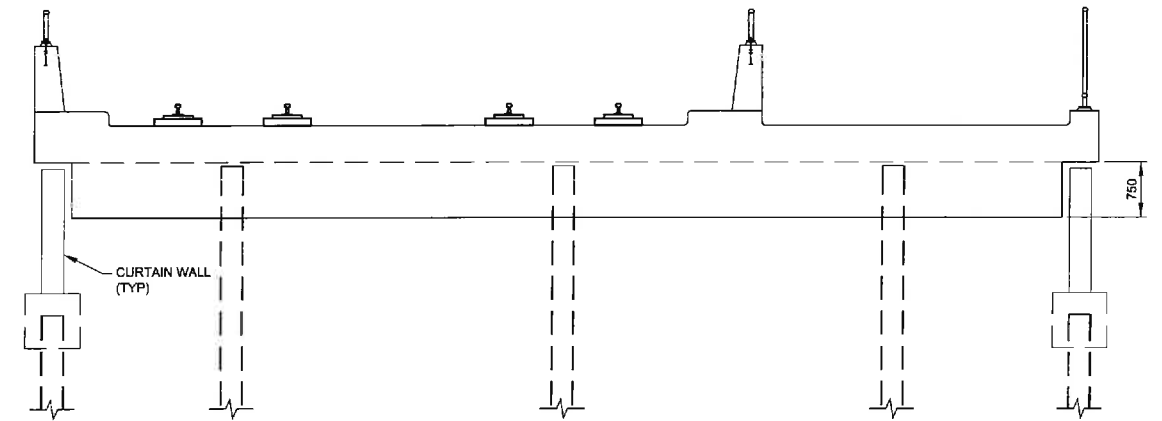
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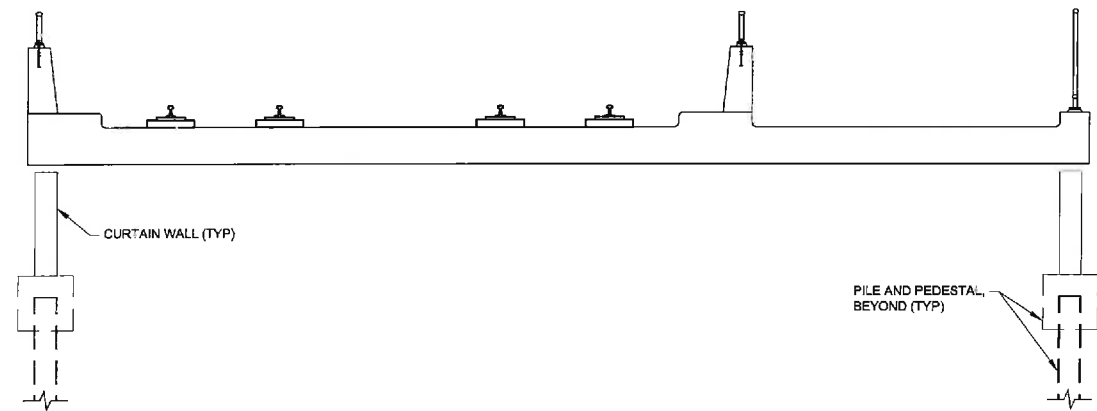
TYPICAL SECTION 1:50
 FACING SOUTH



F SECTION 1:50
 NORTH GRADE BEAM
 FACING NORTH



D SECTION 1:50
 AT CENTER OF TRANSVERSE BEAM
 FACING SOUTH



E SECTION 1:50
 BETWEEN TRANSVERSE BEAM
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consultant

WATERLOO | TORONTO | CALGARY | VANCOUVER

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**PRELIMINARY DESIGN
 NOT FOR CONSTRUCTION**

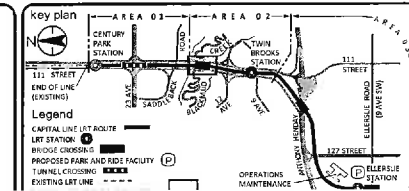
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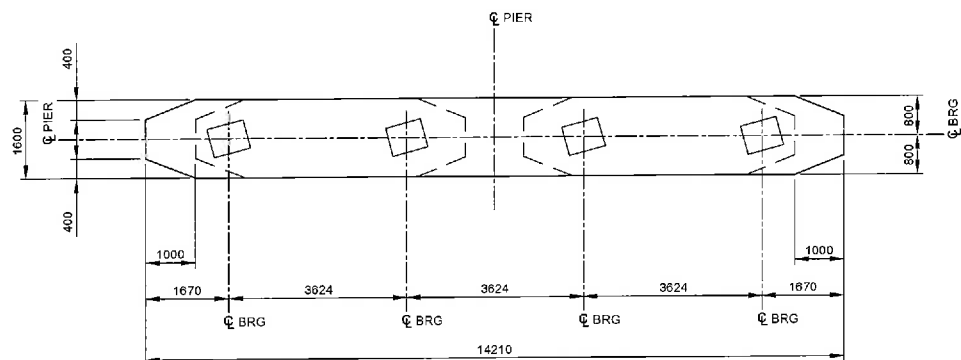
THE CITY OF **Edmonton** CAPITAL CONSTRUCTION
 LRT EXPANSION BRANCH

drawing title
 CIVIL STRUCTURES

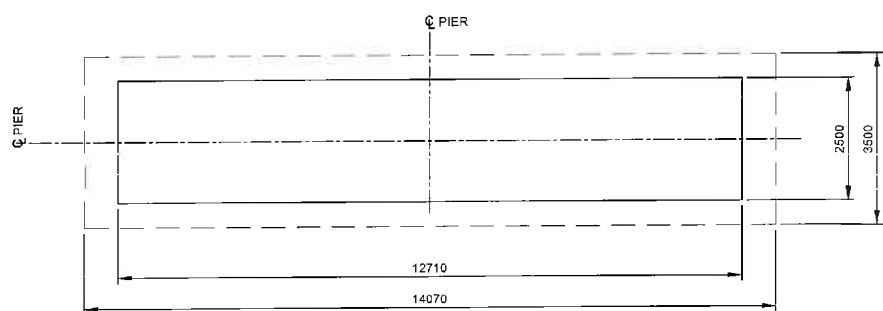
project

SOUTH LRT EXTENSION

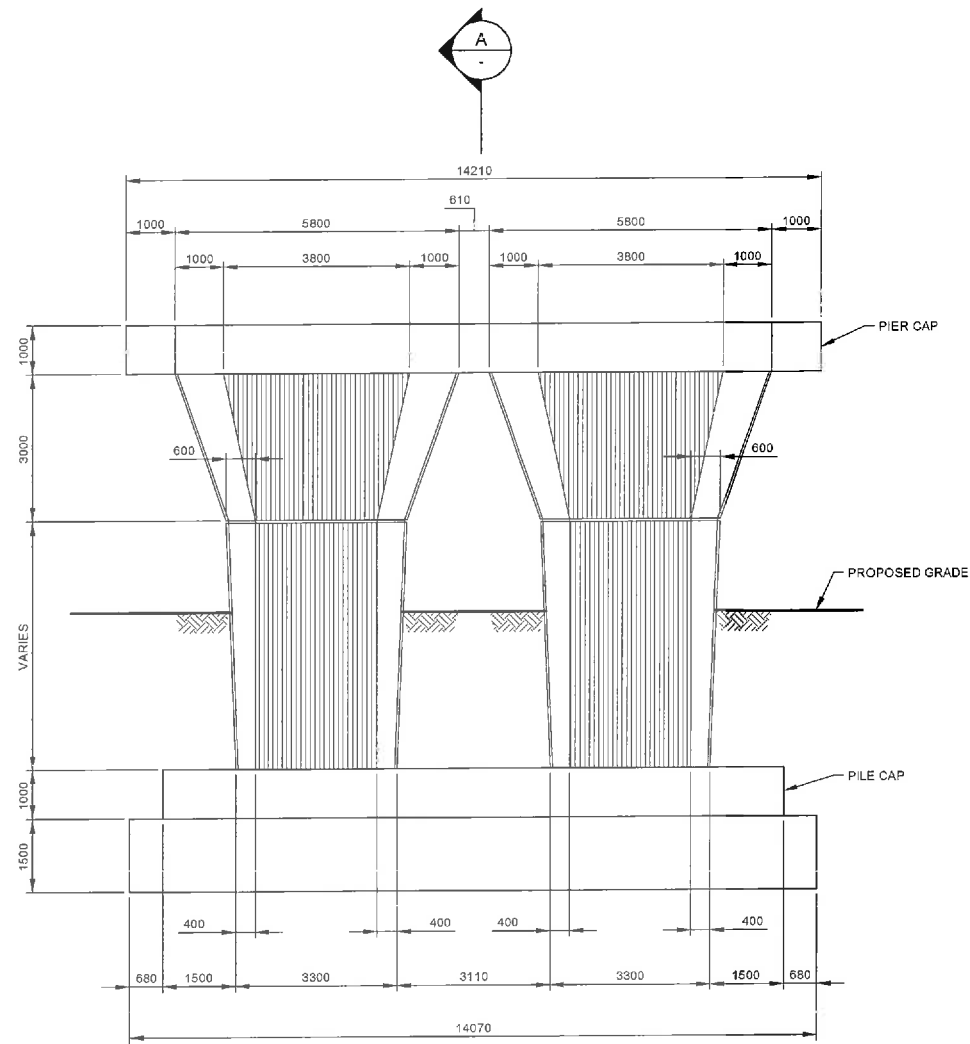
SOUTH LRT EXTENSION
 CENTURY PARK TO
 ELLERSLIE ROAD
 EDMONTON, ALBERTA



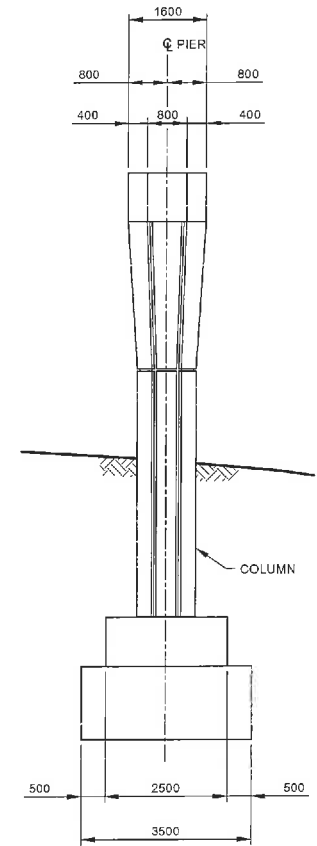
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PIER CAP



PLAN 1:75
PILE CAP



ELEVATION 1:75



ELEVATION 1:75
SIDE VIEW

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CAPITAL LINE PARTNERS

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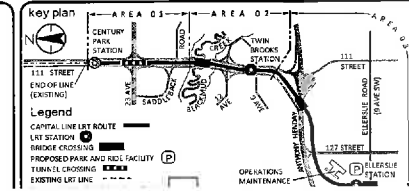
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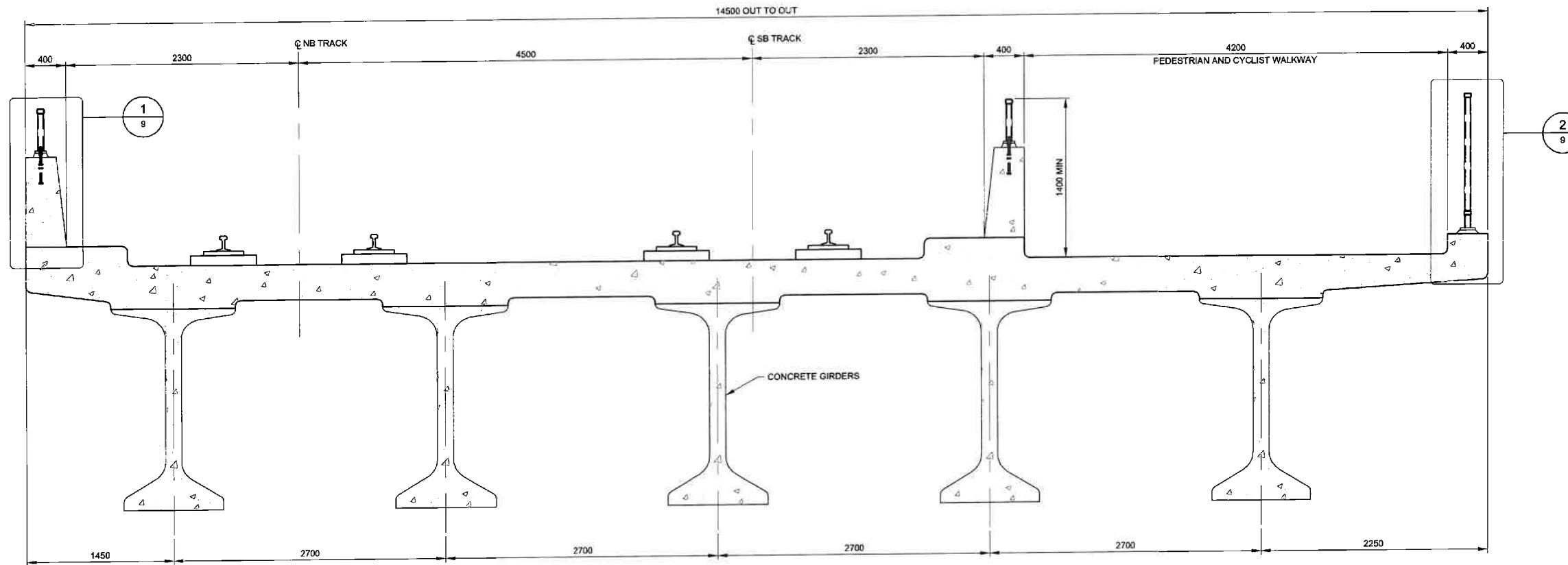


client THE CITY OF Edmonton CAPITAL CONSTRUCTION LRT EXPANSION BRANCH

drawing title CIVIL STRUCTURES

project SOUTH LRT EXTENSION

SOUTH LRT EXTENSION CENTURY PARK TO ELLERSLIE ROAD EDMONTON, ALBERTA



TYPICAL SECTION 1:25

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CAPITAL LINE PARTNERS
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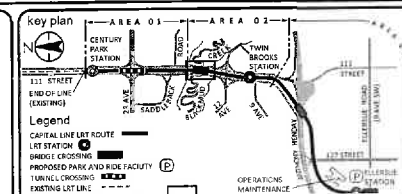
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Edmonton CAPITAL CONSTRUCTION
LRT EXPANSION BRANCH

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CIVIL STRUCTURES

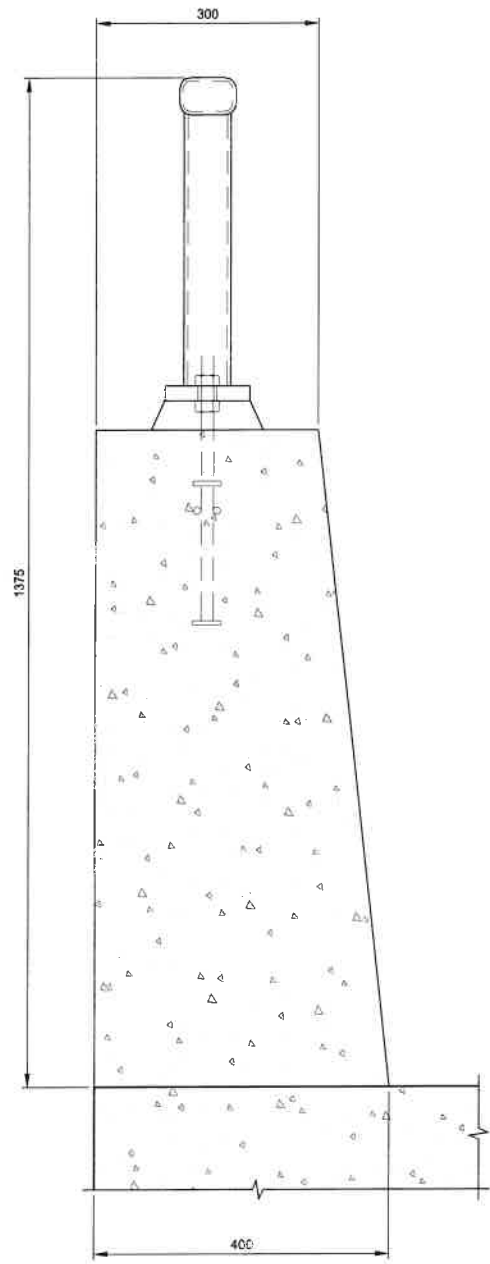
BRIDGE

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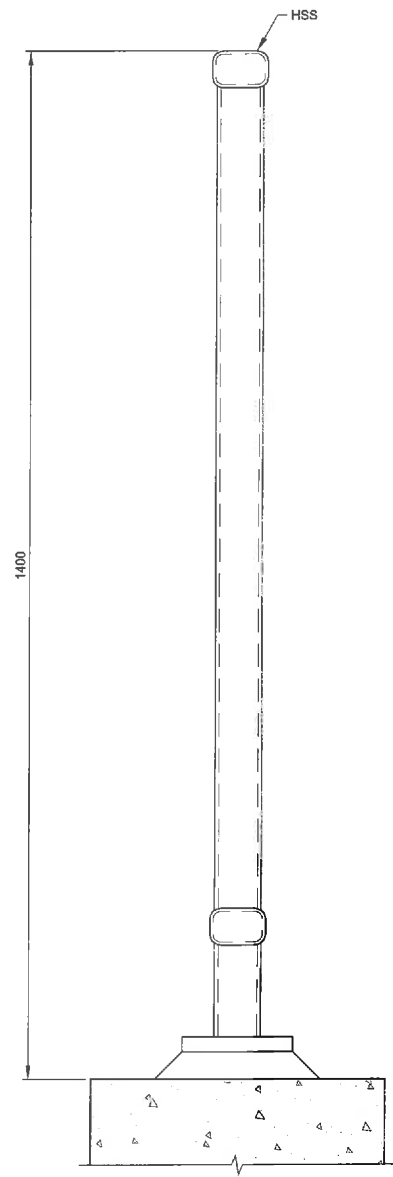
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SOUTH LRT EXTENSION
CENTURY PARK TO
ELLERSLIE ROAD
EDMONTON, ALBERTA

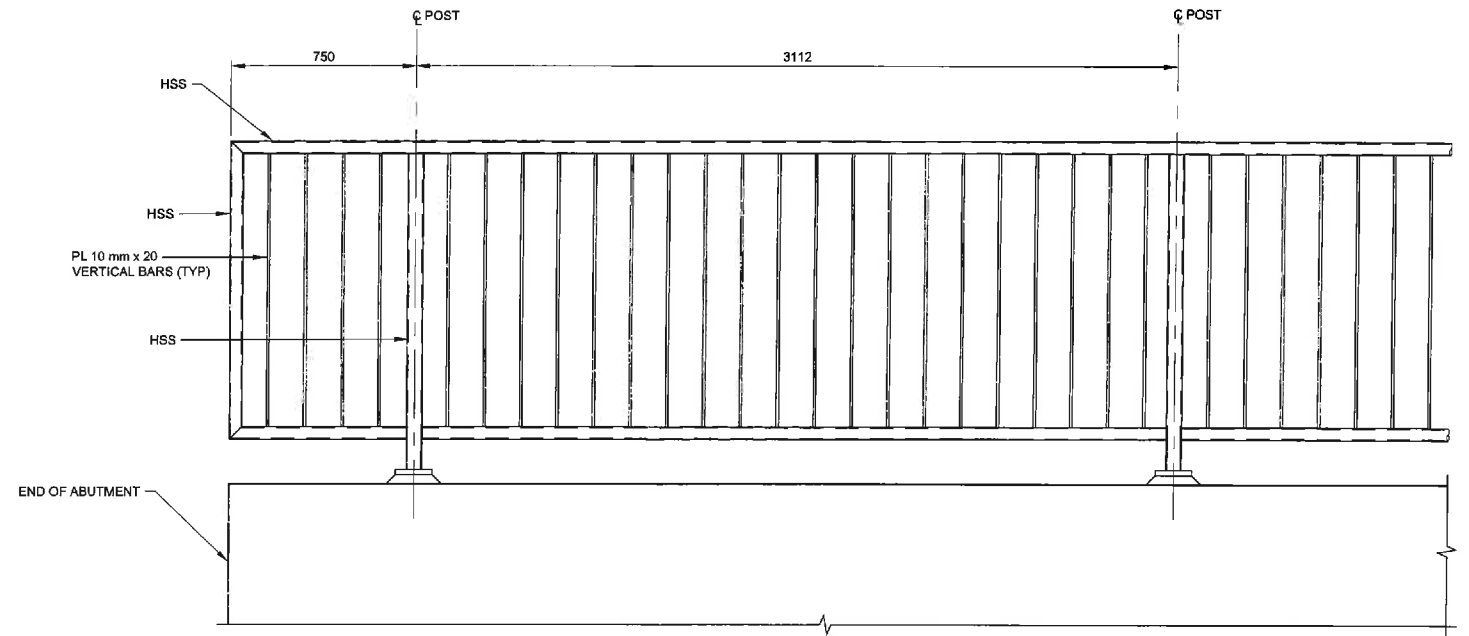
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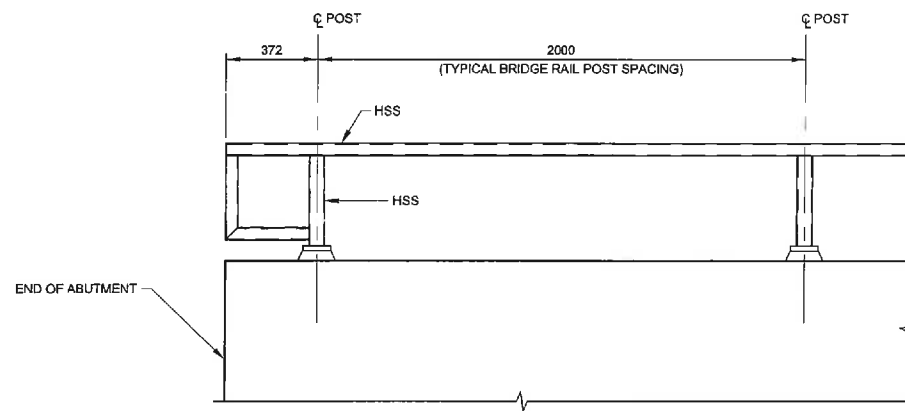
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BARRIER 1:5



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HANDRAIL 1:5



DETAIL 1:15
 TYPICAL HANDRAIL LAYOUT



DETAIL 1:15
 TYPICAL BRIDGE RAIL LAYOUT

consultant

CAPITAL LINE PARTNERS

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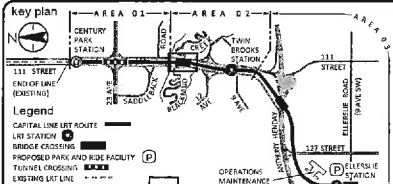
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THE CITY OF
Edmonton
 LRT EXPANSION BRANCH

CAPITAL CONSTRUCTION

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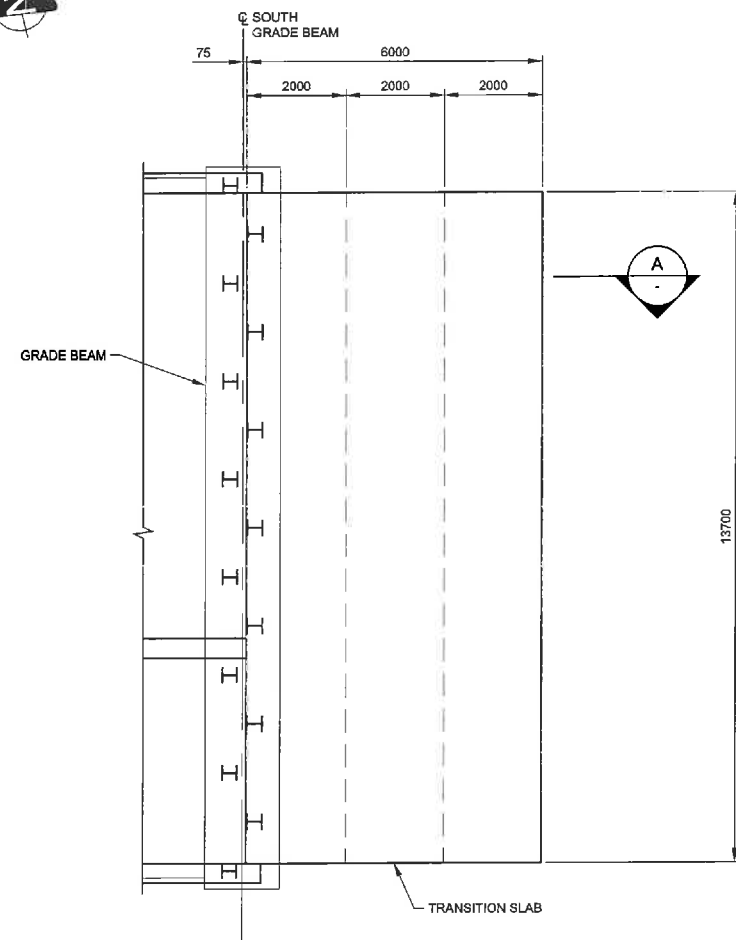
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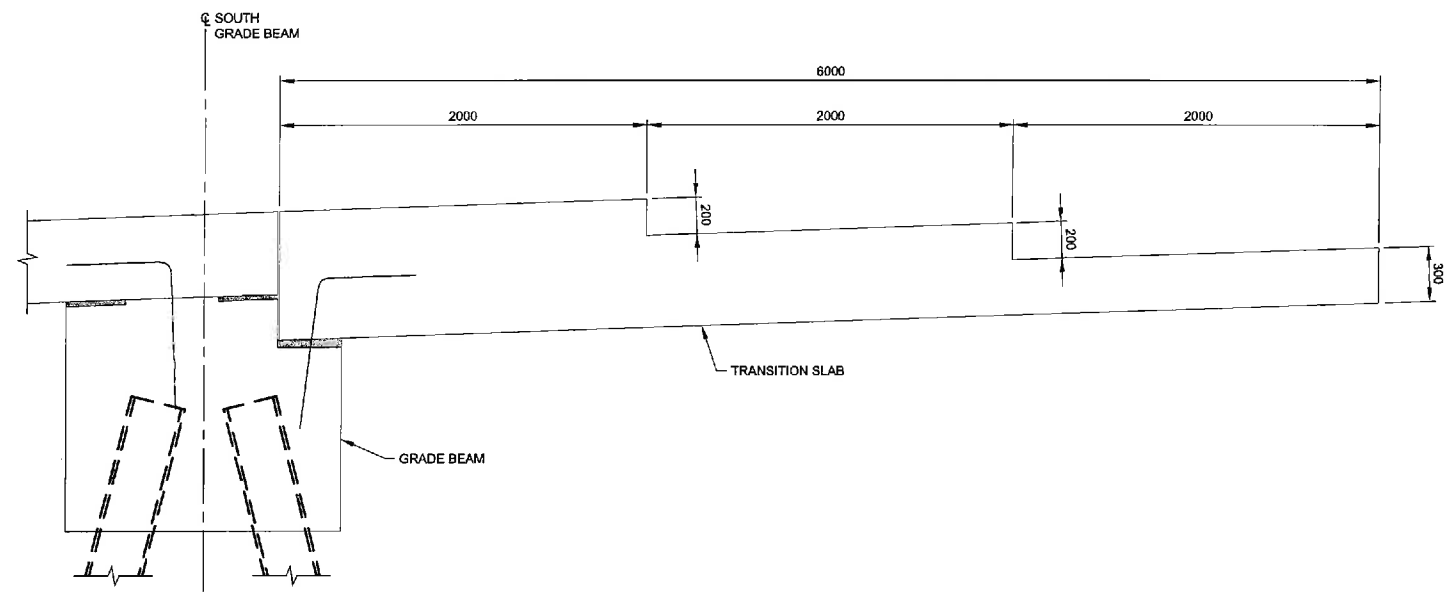
project

SOUTH LRT EXTENSION

SOUTH LRT EXTENSION
 CENTURY PARK TO
 ELLERSLIE ROAD
 EDMONTON, ALBERTA



PLAN 1:75
TRANSITION SLAB



A SECTION 1:20
SOUTH TRANSITION SLAB SHOWN,
NORTH TRANSITION SLAB SIMILAR

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CAPITAL LINE PARTNERS
INTERNATIONAL MOBILITY. COOPERATIVES AND PEOPLE.

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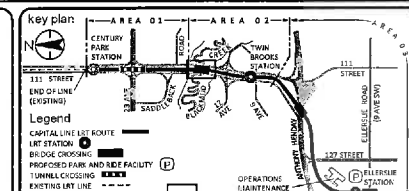
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client

THE CITY OF **Edmonton** CAPITAL CONSTRUCTION
LRT EXPANSION BRANCH

drawing title
CIVIL STRUCTURES

project

SOUTH LRT EXTENSION

SOUTH LRT EXTENSION
CENTURY PARK TO
ELLERSLIE ROAD
EDMONTON, ALBERTA



Appendix B - Statement of Justification and Historical Resources Clearance

Government of Alberta
Culture and Community Spirit

Historic Resources Management
Old St. Stephen's College
8820 - 112 Street
Edmonton, Alberta T6G 2P8
Canada
Telephone: 780-431-2300
www.culture.alberta.ca

FACSIMILE TRANSMITTAL

Historic Resources Management Branch
Land Use Planning
Old St. Stephen's College
8820 - 112 Street
Edmonton, AB T6G 2P8

Phone: (780) 431-2373
Fax: (780) 422-3106

FROM:

Margret Ingbergsson

TO: Name:

Nick Oke

Address:

AECOM

Fax No.:

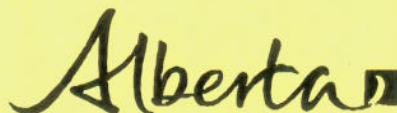
780-486-7070

We are sending you _____ page(s), including this one.

Date:

FAXED AUG 12 2009

The contents of this transmission are intended for the use of the addressee only and may contain information that is privileged and confidential. If you are not the intended recipient, please be advised that any dissemination, distribution or copying of the contents of this fax is strictly prohibited. If you have received this fax in error, or if you have trouble receiving this fax, please notify us immediately by calling the fax operator at the number noted.

MESSAGE:The logo for the Government of Alberta, featuring the word "Alberta" in a stylized, cursive script font, followed by a small square icon.

Freedom To Create. Spirit To Achieve.

Government of Alberta ■
Culture and Community Spirit

Historic Resources Management
Old St. Stephen's College
8820 - 112 Street
Edmonton, Alberta T6G 2P8
Canada
Telephone: 780-431-2300
www.culture.alberta.ca

August 11, 2009

Project File: 4715-09-023

Mr. Nick Oke
AECOM
17007 - 107 Avenue
Edmonton AB T5S 1G3

Dear Mr. Oke:

**SUBJECT: CITY OF EDMONTON
AGENT BEING AECOM
SOUTH LIGHT RAIL TRANSIT EXTENSION
WITHIN TOWNSHIP 51, RANGES 24 & 25, W4M
HISTORICAL RESOURCES ACT CLEARANCE**

Alberta Culture and Community Spirit has received information from The Archaeology Group regarding plans for the proposed South Light Rail Transit Extension from Century Park to Ellerslie Road. Ministry staff have reviewed the potential for this project to impact historic resources and have concluded that an **Historic Resources Impact Assessment is not required**. Therefore, *Historical Resources Act* clearance is granted to proceed with the development of this project.

HISTORICAL RESOURCES ACT REQUIREMENTS

Reporting the discovery of historic resources: Pursuant to Section 31 of the *Historical Resources Act*, should any historic resources be encountered during activities associated with land surface disturbance operations, the Historic Resources Management Branch must be contacted immediately. It may then be necessary for further instructions regarding the documentation of these resources to be issued. Should you require additional information or have any questions concerning the above, please contact me at 780-431-2374 or by e-mail at margret.ingibergsson@gov.ab.ca.

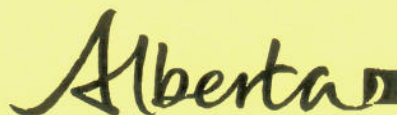
On behalf of the Historic Resources Management Branch, I would like to thank officials of the City of Edmonton and AECOM for their cooperation in our endeavour to conserve Alberta's past.

Sincerely,



Margret Ingibergsson
Land Use Planner

cc: Walt Kowal, The Archaeology Group



Freedom To Create. Spirit To Achieve.

**Statement of Justification for *Historical Resources Act*
Requirements for projects other than small-scale oil and gas**

Project Name or Project Identifier <i>South LRT Extension – Century Park to Ellerslie Road: Preliminary Design</i>		
Disposition Type & Number		
Name: Angela Younie Corporate name of consulting company: The Archaeology Group Phone number: (780) 438-4262 Fax number: (780) 439-4285 E-mail address: amyounie@gmail.com		
Name of proponent contact: Carole Cej, Project Manager Corporate name of proponent: City of Edmonton, LRT Expansion Address: Capital Construction Department, 17th Floor, Century Place, 9803-102A Ave Edmonton AB, T5J 3A3 Phone number: (780) 944-3727 Fax number: (780) 496-6635 E-mail address: carole.cej@edmonton.ca		
Name of agent: Nick Oke, Senior Environmental Scientist/Project Manager Corporate name of agent: AECOM Address: 17007 -107 Avenue, Edmonton, Alberta T5S 1G3 Phone number: (780) 486-7000 Fax number: (780) 486-7070 E-mail address: nick.oke@aecom.com		
Lands Affected		
Legal Description	Land Ownership Type	HRV
30, 31, 32-051-24-W4M	Crown Untitled	N/A
NE, SE-25-051-25-W4M	Crown Untitled	5 (a)
5, 6-52-24-W4M	Crown Untitled	N/A
Activity type and Anticipated Ground Disturbance		
<p>The proposed project is for the extension of Edmonton’s south LRT from the Century Park Station to Ellerslie Road. Ground disturbance would include the excavation of an underpass for the LRT line at 23rd Avenue, surface disturbances for the landscaping and creation of the proposed line, and the creation of a transit station, including train platform, transit centre, parking area, and associated roads and maintenance building. Also proposed are the creation of two power substations located along the LRT line, and a LRV storage station located within the Anthony Henday Transportation and Utility Corridor.</p>		

Project size

Approximately 5.2 km of railway, plus approximately 32 ha for the Ellerslie train station, transit centre, and parking area in the eastern half of SE-25-051-25-W4M.

Existing Disturbance

Existing disturbance is present in the form of pre-existing roadways, bridges, overpasses, subdivision developments, and landscaping, and occurs along the majority of the proposed route. The line is proposed to cross the Blackmud Creek next to the 111 St Bridge, in an area that has been previously disturbed by landscaping and ground disturbance associated with the bridge construction, as well as subdivision and apartment block development. A parking lot, transit station, and a portion of the LRT line are proposed to be developed along the eastern edge of the University of Alberta Experimental Farm, which includes pre-existing disturbance in the form of buildings, roads, and cultivation. The substations, and the LRV storage facility are located along existing roadways and utility corridors.

Landscape and Environmental Information

The proposed *South LRT Extension – Century Park to Ellerslie Road: Preliminary Design* is located within the Central Parkland Natural Subregion, on glaciolacustrine sediments of bedded silt and clay. Natural vegetation and undisturbed land are almost entirely absent as the study area is entirely within the City of Edmonton, and includes developed subdivisions, highways, and commercial areas, and the University of Alberta Experimental Farm. Within this area, the project crosses the Blackmud Creek and borders near the Whitemud Creek, both of which include relatively undisturbed terrain in and around the creek valleys, with the exception of existing trails, bridges and highway crossings.

Archaeological Resources

Borden #	HRV	Site Type	Relationship to activity	Anticipated Impacts
FiPj-56	0	campsite	Outside impact area	None
FiPj-57	0	campsite	Outside impact area	None
FiPj-58	0	campsite	Outside impact area	None
FiPj-59	0	campsite	Outside impact area	None
FiPj-60	0	isolated find	Outside impact area	None
FiPj-61	0	campsite	Outside impact area	None
FiPj-62	0	campsite	Across 111 St from LRT	None
FiPj-64	0	scatter	Outside impact area	None
FiPj-65	0	kill-site	Outside impact area	None
FiPj-71	0	scatter	Outside impact area	None
FiPj-89	0	isolated find	Outside impact area	None
FiPj-90	0	scatter	Outside impact area	None
FiPj-106	0	isolated find	Outside impact area	None
FiPj-107	0	scatter >10	Outside impact area	None
FiPj-108	0	scatter <10	Outside impact area	None
FiPj-109	0	scatter <10	Outside impact area	None
FiPj-118	0	scatter >10	Outside impact area	None

Historic Structure(s)	Anticipated Impacts
Mine #1256 (48486)	Near but outside of impact area; None
Mine #1492 (51118)	Near but outside of impact area; None
Mine #1419 (51119)	Outside of impact area; None
Mine #1233 (51120)	Outside of impact area; None
Mine #1560 (51121)	Outside of impact area; None
Mine #1684 (51122)	Outside of impact area; None
Mine #1477 (51123)	Outside of impact area; None
Mine #1748 (51124)	Outside of impact area; None
Mine #1285 (51125)	Outside of impact area; None
Mine #1462 (51126)	Outside of impact area; None
Mine #1559 (51127)	Outside of impact area; None
Mine #1594 (51128)	Outside of impact area; None
Mine #1646 (51129)	Outside of impact area; None
Mine #1750 (51130)	Near but outside of impact area; None
Mine #1658 (51131)	Near but outside of impact area; None
Mine #877 (51135)	Outside of impact area; None
Mine #1177 (51136)	Outside of impact area; None
Mine #1059 (51137)	Outside of impact area; None
Mine #1034 (51138)	Outside of impact area; None
Mine #29 (51139)	Outside of impact area; None
Mine #1022 (51140)	Outside of impact area; None
Rabbit Hill School (90765)	Outside of impact area; None
Shelter (81862; FiPj-136)	Outside of impact area; None
Permit Number(s)	Relationship to proposed development footprint
79-200	Within project area
80-002	Within project area
80-057	Within project area
80-141	Near project area
86-081	Near project area
87-080	Within project area
89-034	Near project area
90-062	Near project area
90-085	HRIA: Blackmud trail system near 111 St
99-031	HRIA: Anthony Henday including within project area
99-133	HRIM: Site FiPj-107
00-159	Near project area
01-191	Near project area
01-332	Within project area
01-333	Within project area
02-112	Near project area
02-145	Near project area
03-071	Near project area
04-106	Near project area
04-168	Near project area
04-253	Near project area
05-063	Near project area
05-388	Outside of project area
07-146	Outside of project area
08-058	Near project area

Illustrative Materials

Figure 1: Map of Proposed LRT Route (City of Edmonton and Delcan)

Figure 2: Heritage Resources Project Map

Photos 1-3: Blackmud Creek Crossing

Evaluation

The proposed LRT line and associated facilities for the *South LRT Extension – Century Park to Ellerslie Road: Preliminary Design* are located within the City of Edmonton, and generally follow previously developed roadways and utility corridors (Figure 1).

Surrounding previous developments include shopping centres and subdivisions, as well as the University of Alberta Experimental Farm at the south end of the project area.

Terrain in the project area is generally flat, but includes the Blackmud and Whitemud Creek valleys. In order to limit ground disturbance in the environmentally and culturally sensitive Blackmud Creek valley area, the LRT line is proposed to be integrated with the current crossing on 111 Street (Photos 1-4), with a bridge for the LRT line built to the west of the existing bridge. The line is also proposed to run through the eastern edge of lands currently used as the University of Alberta Experimental farm.

The proposed development area, especially the northern portion, has been heavily surveyed since 1979 (23 HRIA permits; 1 HRIM permit, and 1 Monitoring permit) for a variety of development projects, including subdivisions (79-200, 80-057, 86-081, 87-080, 01-332, 01-333, 02-112 04-168, 04-253), the Anthony Henday freeway and utility corridor (99-031, 99-133, 03-071), and local parks and trail systems (80-141, 90-085, 00-159). Survey under these permits has been focused in the areas near the Whitemud and Blackmud Creek valleys. These features indicate a high potential for the discovery of heritage resources, and a high number of archaeological sites have been previously discovered in the vicinity, generally found along the Whitemud Creek Valley and its tributaries to the west of the project area. A few sites are also located along the Blackmud Creek. Surveys for a variety of projects have been previously conducted in the vicinity of the 111St bridge at the Blackmud Creek, with no sites found within the project impact zone.

A total of 17 archaeological sites and 4 historic sites have been previously recorded near the project area, with many more located in the vicinity (Figure 2), however, no known sites are located within the project impact zone.. Two quarter sections of land within the project boundaries have been designated an HRV of 5 for archaeology due to the high number of large, significant archaeological sites found 500 m to the west of the project area, on lands designated HRV 4 near the Whitemud Creek. The majority of historic sites near the area are associated with mining activity in the Whitemud Creek valley, and will not be disturbed by the proposed LRT development.

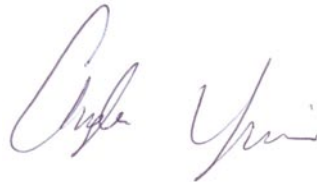
The development of the Ellerslie Transit station will involve the disturbance of a large portion of the terrain designated an HRV of 5, and currently used as the University of Alberta Experimental farm (Figures 1 & 2). However, this land has been previously disturbed by cultivation, as well as by the development of numerous buildings and parking lots associated with the experimental farm. It is also located from 400 m to over 1 km away from the Whitemud Creek Valley edge, where most of the previously discovered sites in the vicinity are located.

Recommendations (*Recommendations regarding archaeological resources must be made by a professional archaeologist.*)

The proposed *South LRT Extension – Century Park to Ellerslie Road: Preliminary Design* is located within the City of Edmonton, and generally follows previously developed roadways and utility corridors. The project area includes land of high heritage potential, including sections designated an HRV of 5 for archaeology, and the Whitemud and Blackmud Creek valleys; however, the project area has been subjected to multiple previous surveys, and has been previously disturbed by municipal, commercial and residential construction. No previously recorded historic or archaeological sites will be disturbed by the development. The Blackmud Creek crossing is planned to be developed in the area of the existing bridge on 111 Street, thereby limiting ground disturbance and focusing within previously disturbed areas. The Ellerslie transit station, including train platform, transit centre, parking area, and associated roads and maintenance building, will be located on land designated an HRV of 5 for archaeology; however, these lands have been previously disturbed by cultivation and infrastructure associated with the University of Alberta Experimental Farm.

Due to intensive previous heritage survey activity and ground disturbance, there is a low potential for the discovery of intact, previously unrecorded heritage resources within the project area, and **no further work is recommended for the *South LRT Extension – Century Park to Ellerslie Road: Preliminary Design*.**

Recommendations made by:



(Angela Younie)

Date:

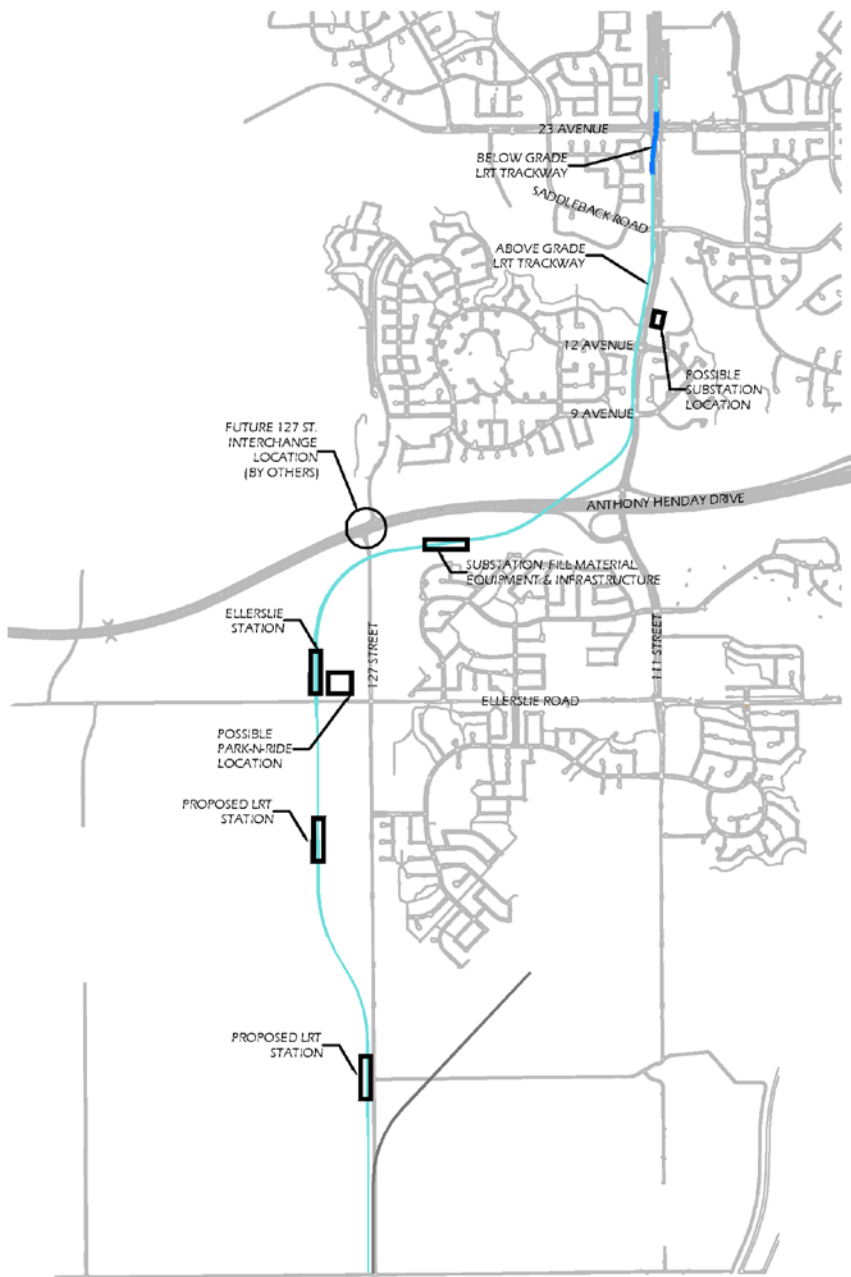
July 3, 2009

Integrated South LRT Corridor Development Conceptual Planning Study



City of Edmonton

nts



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Overall South Corridor Development

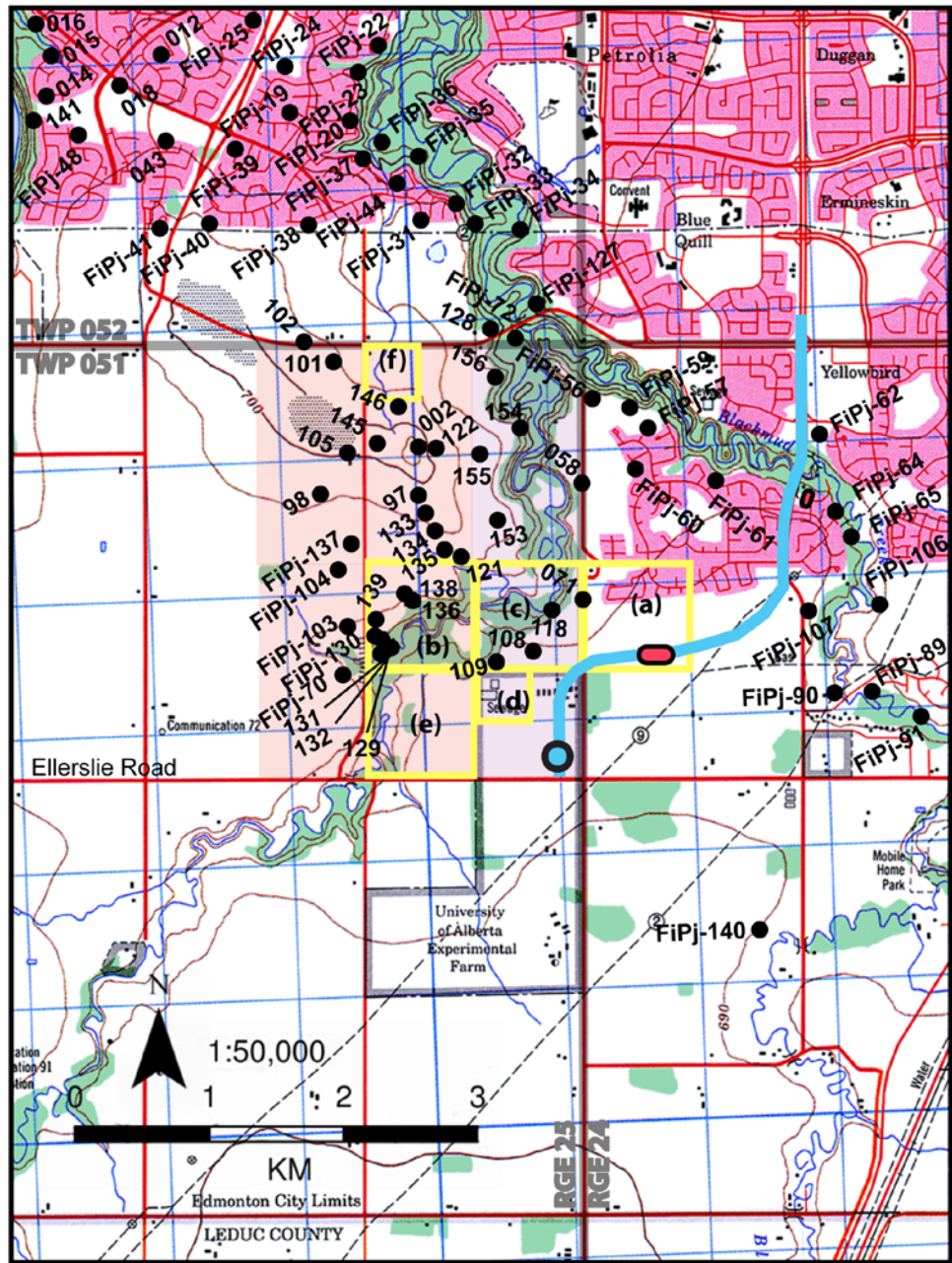
EXHIBIT

ES-3



In Association with:
Urban Systems Ltd.
Golder Associates
PAAE Ltd.
Gray Scott Group Inc.

Figure 1: Route 2 as Recommended by the Integrated South LRT Corridor Development Conceptual Planning Study.



Historic Sites:

(a) NW-30-051-24-W4M
Mine #1256 (48486)

(b) NW-25-041-25-W4M
Mine #877 (51135)
Mine #1177 (51136)
Mine #1059 (51137)

11-25-051-25-W4M
Mine #1560 (51121)
Mine #1684 (51122)
Mine #1477 (51123)
Mine #29 (51139)

12-25-051-25-W4M
Mine #1022 (51140)
Mine #1285 (51125)
Mine #1462 (51126)
Mine #1559 (51127)

5 & 12-25-051-25-W4M
Mine #1748 (51124)

13-25-051-25-W4M
Mine #1646 (51129)
Mine #1594 (51128)
Shelter (81862; FiPj-136)

(c) NE-25-051-25-W4M
Mine #1750 (51130)
15-25-051-25-W4M
Mine #1658 (51131)

(d) 07-25-051-25-W4M
Mine #1492 (51118)

(e) 04-25-051-25-W4M
Mine #1419 (51119)
05-25-051-25-W4M
Mine #1233 (51120)
06-25-051-25-W4M
Mine #1034 (51138)

(f) 13-36-051-25-W4M
Rabbit Hill School (90765)

**Integrated South LRT Corridor Development
Heritage Mall to Ellerslie Road**








 LRT Line	 Historic Site Area	 Land Designated HRV 4
 Station and Parking Lot	 Archaeological Site	 Land Designated HRV 5
 Substation Location		

Figure 2: Heritage Resources Associated with the Integrated South LRT Corridor Development, Heritage Mall to Ellerslie Road.



Photo 1: View southeast of current landscaping and roadway disturbances at the proposed Blackmud Creek Crossing



Photo 2: View southeast of current roadway and bridge disturbances on the west side of the bridge at the proposed Blackmud Creek crossing.



Photo 3: View west of landscaping and construction disturbances along 111 St, on the north side of the bridge. A detailed view of the disturbed terrain in the trees at the far left of this photo can be seen in Photo 4.



Photo 4: View facing east of the disturbed terrain on the north end of the bridge, at the top of the slope on the west side of 111 St.



Appendix C – EIA and SLS Sign Off



December 06, 2019

Reference No. 313069293-001

To: Adonis Dichoso, LRT Extension & Renewal, IIS
Sandra Meidinger and Suzanne Card, Associated Environmental Consultants Inc.

From: Achyut Adhikari, City Planning

Subject: SD19-19 Blackmud Creek South LRT Extension Crossing EIA and SLS- Sign off

We have completed our review of the Blackmud Creek South LRT Extension Crossing EIA and SLS 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 note the proposed development meets the definition of a major facility, and as such, City Council must approve the EIA and SLS, and must deem the proposed location in the River Valley as essential, to ensure the policy requirements of the NSRV ARP are satisfied.

Please adhere to the following conditions and advisements provided by reviewers.

Comments from City Planning (Urban Growth and Open Space Strategy):

We understand the project is now at an early stage of construction and the consultant may be unable to address concerns that is more related to construction and restoration.

Please attach a concordance table with the final EIA draft with detailed information on follow up tasks for implementation of mitigation strategy, restoration and monitoring work at the detailed design, construction and operation stages of the project if the detailed was not covered within the Table 4-7 and 4-8 of the EIA report.

Any changes to the proposed mitigation strategy and scope of work moving towards detailed design, construction and operation stages should be considered a new scope and required further review. The restoration plan and monitoring plan once prepared at the next states should be provided for review and comments. We will expect the final outcomes of mitigation, restoration and monitoring activities for follow up since this project is projected likely take a longer project cycle.

If the project construction starts after 5 to 7 years from the date of current assessment, we would like to revisit key environmental parameters for potential review with the current context. Also, please inform us if this project construction is delayed for a long time frame due to any reasons. We should be able to provide most updated contact list for follow up as identified under this memorandum.

Please include all the reviewers comments, follow up response and recommended actions with the final EIA report.

Comments from City Planning (Urban Growth and Open Space Strategy):

Thanks for sending this my way for a final review. Everything is looking good, except, now the EIA is silent on how to improve avian connectivity over or below the bridge.



I think the original intent of the following statement "Light created by this offset with help to facilitate bird passage" was to speak to strategies to improve bird passage in the area. However, their clarification now focuses solely on improving terrestrial use ("This space will allow for light, which will assist in terrestrial movement") and excludes any strategies for improving avian use.

Please ensure there is inclusion of plantings to support bird use around the crossing.

Comments from EPCOR Drainage Services (Water and Sewer Servicing):

1423U 111 Street NW and 128 Running Creek Road NW

Our records indicate that water services exist through the area of the proposal directly off Epcor mains.

Comments from Business Planning and Support (Engineering Services):

Engineering Services has reviewed the information provided for the proposed Blackmud Creek South LRT Extension Crossing Project. This information included a Draft Site Location Study (SLS) dated March 8, 2019 and a Draft Environmental Impact Assessment (EIA) dated March 8, 2019, both prepared by Capital Line Partners. The EIA included a project- and site-specific geotechnical report prepared by AMEC Earth & Environmental. (AMEC), File No. EG09681.BMC, dated January 28, 2010.

The SLS provided a generalized description of the proposed project and the rationale for the proposed location, crossing Blackmud Creek along the west side of the existing 111 Street crossing. The SLS did not include any geotechnical information. That said, we would concur with the SLS conclusion that proposed location of the new LRT bridge and multi-use trail (MUT) is the most appropriate site to meet the objectives of the Transportation Master Plan.

It is understood that the proposed design for the project consists of a single 3-span bridge carrying both the LRT and MUT, with 48 m long approach structures leading up to each of the abutments. The approach decks at each of the abutments will be structurally supported on pile foundations and grade beams, with no additional fill to be required at the abutments. Since no additional fill is required, the proposed configuration will likely have minimal impact on the stability of the valley walls.

The EIA included reference to site-specific geotechnical information from the appended AMEC preliminary geotechnical report. The AMEC geotechnical report appended to the EIA appeared to be a comprehensive report that included the requisite information to facilitate the preliminary design of the proposed development. **However, it should be recognized that additional geotechnical investigation will be required to support detailed design for the proposed development. The report recommendations for further geotechnical investigations should be followed, which would include advancing additional geotechnical boreholes at the pier and abutment locations.**

It is not clear from the information provided for review whether the geotechnical consultant has conducted a review of the proposed design drawings and specifications. Furthermore, changes to site conditions may have occurred since AMEC's preliminary investigation was conducted nearly 10 years ago. **It is therefore recommended that the geotechnical consultant shall review the proposed design for the project as well as the current site conditions.**

It is anticipated that the geotechnical risk associated with this project can be suitably mitigated through the ongoing involvement of the geotechnical engineering consultant. Provided that the



recommendations included in the EIA and appended geotechnical report are adhered to and that the geotechnical engineering consultant is involved in future phases of the development, it would appear that the geotechnical aspects of the project will be addressed accordingly.

If you have any questions regarding these comments, please contact me at (780) 944-7686.

Comments from City Planning (Planning Coordination):

Based on my search, there are no abandoned wells, active high-pressure pipelines, or other oil and gas infrastructure within the study area of Blackmud Creek Crossing. Therefore, I have no comments on this circulation.

Comments From City Planning Development Engineering and Drawing Review):

no comments to offer on the attached reports. We currently have no record of any pending developer-initiated construction projects near or within the project limits

Comments from Community and Recreation Facilities (Civic Events and Festivals):

No comment.

Comments from Community and Recreation Facilities (Partnership and Event Attraction Strategy):

No comment.

Comments from Community and Recreation Facilities (River Valley Parks and Facilities):

For lay down area it states: "Since this is inside the North Saskatchewan River Valley ARP and near Blackmud Creek, fuels, soil stockpiles, or any leachable or hazardous construction materials will be permitted for storage at this laydown area." I believe they are missing the word "NOT" in this statement.

Require trail access plan for pedestrians to move from the west side of the street to the east side, as current trail route underneath the bridge, or if they will have trail open and use overhead hazard mitigation to allow crossing. Would require signage on trails to east, and the north west. Any trail questions/concerns, please contact Braeden Holmstrom.

Comments from Parks and Roads Services (Natural Area Operations):

Please note that a Tree Preservation Plan will be required prior to site mobilization for any trees within 5 meters of construction.

- Once the landscape plans have been finalized, please ensure they are circulated to Natural Area Operations for review prior to approval.

- Please note there has been an update to the Corporate Tree Management Policy. It is now Corporate Tree Management Policy C456B.

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

- 1) A pre-construction inspection 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) This project must follow all City Policies and Servicing Agreements
- 3) Project must be reviewed Natural Areas Operations.
- 4) The site is in compliance with the site's Natural Area Management Plan.
- 5) Please follow The City of Edmonton Landscape Design and Construction Standards Volume 5 – Landscaping.
- 6) Any damaged turf areas shall be re-sodded or repaired with like grasses/vegetation as required and maintenance (watering and mowing) of restored turf areas will be the responsibility of the proponent until the turf is established. All damages to natural areas must be restored to pre-existing conditions with natural plantings as required and the maintenance (watering) 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 (shrub beds, etc) must be restored to pre-existing conditions and COE Construction Standards and City Operations satisfaction.
- 7) Any new trail construction or rehabilitation must have a minimum 1M buffer zone, free of vegetation on either side of the trail.
- 8) 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 (C456A). City of Edmonton will schedule and carry out all required tree work involved with this project
- 9) Tree protection is required around existing boulevard trees near the site access points. A minimum 2M protection barrier surrounding each tree is required.
- 10) Site drainage must not be affected by this project.
- 11) Please limit the slope of any possible hills or swales to a maximum of 3:1 (ie less than 18.0 degrees or 33.3 percent)
- 12) Any chain-link fence installed on COE property must have 9 gauge wire, before any plastic coating as per Standard 2.1.2 - Nominal wire diameter: 3.5mm (9-gauge)
- 13) Please ensure site drainage is not affected by this project and water moves efficiently and quickly and does not allow ponding for several days post rain event.
- 14) The finished surface of the shared path must be level with the existing turf grade level. 3.7.2 Where sod butt joins surface paving, i.e. manhole, sidewalk or curb, position sod turf crown flush with finished hard surface.
- 15) There is no dumping or stockpiling on the site.
- 16) Hard-surface access routes are preferred for large equipment.
- 17) Any holes must be filled immediately to ensure public safety during project.
- 18) Weeds must be controlled as per the Weed Act.
- 19) Use of the area must be managed carefully to prevent any spills or release of contaminants.
- 20) Erosion and Sedimentation Control Measures must be in place prior to any construction activity to prevent any contaminants from entering Infrastructure or water bodies.
- 21) Any lay down/staging area must be fenced, with no vehicular or project activity outside of the fenced area.
- 22) The site is left in an intended state that meets the City's satisfaction.
- 23) Signage must be posted indicating a project contact person and phone number for inquiries.

General Conditions Regarding Vegetation Removal:

- 1) Upon approval of the plan, a site meeting with Forestry will be required to review construction plans and tree protection during construction conflicts (construction work within 5 meters). 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 in and out of the laydown site, placement of all permanent or temporary construction material required for this project, and to determine tree protection requirements within 5 metres of any city tree during the construction work or use of parkland area for the



designated lay-down area. Please be advised that all costs associated with the removal, replacement or transplanting of trees shall be covered by the Proponent as per the Corporate Tree Management Policy (C456A). Forestry will schedule and carry out all required tree work involved with this project. Please contact naturalareaoperations@edmonton.ca to arrange this meeting.

- 2) Any soil damage or compaction compromising the trees root system within the parkland space, boulevard, or within the City's Right-of-Way buffer green space shall be corrected by and at a cost to the proponent/project. Please be advised that all costs associated with soil remediation or with watering, removal, pruning, replacement, transplanting, and protection of trees shall be covered by the proponent as per the Corporate Tree Management Policy (C456A).
- 3) 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 (C456A).
- 4) Please note that the removal of vegetation has the opportunity to impact birds and bird habitat. It is recommended that a nest search is completed a maximum of seven days prior to any disturbance. The nesting period in Edmonton is mid-February to late-August. 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.

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 Linda Bombardieri 780-944-5783 in the area to ensure appropriate community notification.
- 4) For potential impacts to City parks and facilities:
 - a) 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.
 - b) Noxious weeds shall be managed and controlled as required within any fenced area and should be the responsibility of the contractor/department during construction.
- 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 **587-986-2841** 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 780-442-0695.

Regards,

Achyut Adhikari