THE CITY OF EDMONTON
DESIGN-BUILD AGREEMENT
CAPITAL LINE SOUTH LRT EXTENSION PHASE 1

Schedule 5 – D&C Performance Requirements

Part 2: Sustainable Urban Integration and Landscape Architecture

[NTD: Schedule 5 D & C Performance Requirements – all parts – will be amended July 30 2024 to reflect requirements associated with Appendix A - Affordability Opportunities Amendment Term Sheet]

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PART 2: SUSTAINABLE URBAN INTEGRATION AND LANDSCAPE ARCHITECTURE

SECTION 2-1– DESCRIPTION OF INFRASTRUCTURE

2-1.1 SUSTAINABLE URBAN INTEGRATION

A. Sustainable Urban Integration (SUI) focusses on the mutually-supportive integration of the Infrastructure into the context where it will be located.

B. SUI requirements must be reflected in all aspects of the Design and Construction of the Infrastructure and the LRT Corridor. It must provide a high quality, fully accessible, safe, efficient, visually integrated, and environmentally sustainable transportation network and associated LRT Corridor amenities that:

1. Maximize convenience for Patrons
2. Support the City's continuing economic prosperity
3. Serve and in turn are served by transit oriented land use policies
4. Consistent with ConnectEdmonton: Edmonton's Strategic Plan 2019-2028. Available on the City's website.

2-1.2 SUI KEY VALUES

A. The following key values are critical to the success of the Design, Construction, maintenance, long-term sustainability, and use of the Infrastructure and LRT Corridor:

1. **Pedestrians First:** The Design-Builder must apply a 'Pedestrians First' approach that is safe, facilitates convenient, fully accessible access to the infrastructure and to the communities adjacent to the LRT Corridor, while creating a sense of place within the public realm.
2. **Sustainable:** The Design-Builder must conserve and connect to the City open spaces within and adjacent to the Lands, enhance existing natural and ornamental LRT Corridor landscapes, support the City Plan, Climate Resilience Policy C627, and Environmental Policy C512, and integrate sustainable technologies and materials wherever possible.
3. **Flexible and Adaptable:** The Design-Builder must incorporate design elements and systems that are flexible, adaptable, and capable of responding to future conditions.
4. **Integrated:** The Design-Builder must integrate the infrastructure into the existing environment, infrastructure, and the Capital Line LRT using a holistic approach across all design disciplines.

2-1.3 SUI GOALS AND OBJECTIVES

A. SUI is the overarching principle that must be considered throughout the design of the Infrastructure and the LRT Corridor it falls within. Every component is influenced by SUI. The SUI design goals and objectives are overarching and interconnected. They support the key values and should not be considered in isolation from each other.

B. Each key value has at least one goal with objectives to assist in achieving that goal. Others may become apparent and should be identified by the Design-Builder during the design process.

2-1.3.1 'Pedestrians First' ('PF') Goals and Objectives

A. The Infrastructure and the LRT Corridor must contribute to a multimodal way of life. Many Patrons will be a pedestrian while in or accessing the Infrastructure and LRT Corridor. The look, feel and user experience within the LRT Corridor is very important and the following goals and objectives must be met:

1. **'PF' GOAL 1:** Create a vital, diverse, and pedestrian friendly environment with a strong sense of place throughout the LRT Corridor (from Century Park to the Transportation Utility Corridor (TUC) and at Heritage Valley North Station) for all users: LRT Patrons and staff, motorists, cyclists, users of adjacent residents/businesses, and pedestrians of all abilities. The portion of the LRT Corridor between 9 Avenue and Heritage Valley North Station will primarily be experienced by Passengers and a pedestrian perspective is not required.

2. **'PF' 1 – Objective A:** Represent and build on each unique existing neighbourhood context along the LRT Corridor, including but not limited to:

    a. the design of Character Zones and, where applicable, the Opportunity Areas and Specialty Areas within the Character Zones;

    b. the design of each component along the LRT Corridor to respond to its context and user need; and

    c. the enhancement of existing nodes, community entrances and features, connections, and existing natural and ornamental landscapes to create a comprehensive LRT Corridor landscape/environment.

3. **'PF' GOAL 2**: Provide a high level of positive user experiences that respond to the varying users' proximity, interaction, and time spent within the LRT Corridor for all modes of transportation and, for those adjacent to the LRT Corridor.

4. **'PF' 2 – Objective A:** Design the LRT Corridor to provide a positive user experience by considering the users':

    a. place within the LRT Corridor during their specific journey (i.e. sidewalk/SUP, crosswalk, LRV, road, property backing onto LRT Corridor, adjacent to an elevated or below-grade structure);

    b. proximity to Infrastructure and other elements (i.e. structures/buildings, trackway barriers, landscaped areas);

    c. speed and time in the LRT Corridor and type of movement through the LRT Corridor (i.e. as a pedestrian or cyclist, riding in an LRV, as a motorist or passenger); and

    d. views and focal points along the LRT Corridor.

5. **'PF' GOAL 3:** Ensure that each component within the LRT Corridor presents a positive contribution to the built environment for the Infrastructure's users, neighbours, and passersby.

    a. 'PF' Objective A: Minimize visible infrastructure to achieve a coherent and uncluttered appearance through the integration of systems and structures/buildings including, but not limited to: stations, street lighting, wayside enclosures, bungalows, cubicles, the Overhead Contact System (OCS), traffic signals, signage, and passenger interface equipment.

2-1.3.2 'Sustainable' ('S') Goal and Objectives

A. The Infrastructure and LRT Corridor design strategies must minimize the impact of the new infrastructure on its surrounding environment. They must be integrated, recognize the context, and work together to promote conserving the basic nature of the site. Preserving and improving air, water, and soil quality, and energy while optimizing their use and providing enhancements for the users is important. The following goal and objectives must be met:

1. 'S' GOAL 1: Minimize impacts of LRT construction and operation, conserve the site and improve existing conditions to create a more sustainable Infrastructure and LRT Corridor.

2. 'S' Objective A: Use design strategies to achieve the goal that include but are not limited to:

    a. maintain and enhance the existing neighbourhood character;

    b. protect adjacent bird, animal, and invertebrate habitats;

    c. eliminate or minimize light pollution;

    d. introduce and integrate sustainable technologies, such as, but not limited to, photovoltaics, wherever possible;

    e. provide fully accessible and easy access to public transit and alternate modes of transportation;

    f. minimize the removal of existing native/naturalized vegetation and Street Trees;

    g. manage stormwater runoff so that it replenishes the ground water table through both simple (e.g. deeper organic soil) and more complex Low Impact Development (LID) best management practices;

    h. provide open space that:

        i. promotes biodiversity with native and drought resistant landscaping that provides bird, animal, and invertebrate habitats and conserves water;

        ii. assists with the reduction of the urban heat island effect; and

        iii. contributes to the City's goal of 'Two Million Trees by 2050'.

    i. manage the long-term and short-term maintenance requirements for hard and soft infrastructure through the selection of appropriate and reliable materials and systems.

2-1.3.3 'Flexible and Adaptable' ('FA') Goal and Objectives

A. The Infrastructure and LRT Corridor design strategies, as understood today, must recognize future potential short-term and long-term influences and impacts on the infrastructure and their implications. The following goal and objectives must be met:

1. **'FA' GOAL 1:** Include flexible and adaptable design solutions that can accommodate future modifications due to anticipated potential impacts or influences.

2. **'FA' Objective A:** Consider potential causal conditions and respond to those most likely to impact the Project. These may include, but are not limited to:

    a. Climate change and resiliency;

    b. Site conditions;

c. Land use changes, including density and zoning;

d. LRT Corridor and adjacent land users;

e. Transportation modes;

f. Current and upcoming technical advancements; and

g. Supply chain opportunities and constraints.

2-1.3.4 'Integrate' ('I') Goal and Objectives

A. The Infrastructure and LRT Corridor design must provide a seamless environment where all components are designed and located in a manner that supports the cohesive, holistic design intent while allowing for unencumbered use of the LRT Corridor for all users. The following goal and objectives must be met:

1. **'I' GOAL 1:** Integrate the High Floor LRT infrastructure into its surroundings.

2. **'I' Objective A:** Use the following in the design:

a. infrastructure (e.g. Station, OCS) that is appropriately scaled to the surrounding public realm in terms of anticipated ridership and adjacent land uses;

b. Pedestrian Priority Zones, pedestrian crossings and access systems and strategies that place the greatest emphasis on pedestrian safety, accessibility, convenience, and active mode connectivity throughout the LRT Corridor;

c. landscape development that enhances the existing landscape, supports user activities and experiences (e.g. provides shade, wind breaks) and increases biodiversity;

d. Barrier-Free design:

i. elevated platforms that achieve door-level boarding, barrier-free access to platform level with sloped walkways rather than code-minimum ramps or stairs;

ii. Barrier-Free connections (e.g. well defined Shared Use Paths (SUPs), sidewalks, and crosswalks without any impediments or pinch points) that are an extension into the surrounding neighbourhoods, provide safe passages, and ease of maintenance; and

iii. LRVs operating in the right-of-way that are segregated from other modes, with smaller physical and visual barriers between adjacent roadway and trackway alignments.

2-1.4 SUI COMPLIANCE

A. SUI, as the overarching principle, is contained within the entire Project Requirements and must be considered wholistically. The key values, and goals and objectives must be met.

B. Unless specifically indicated otherwise, all Infrastructure materials, components and equipment described in this Schedule must comply with the City of Edmonton Design and Construction Standards and the High Floor LRT Design Guidelines.

C. A Final SUI Report (maximum of five A4 pages, single sided, 10 pt font minimum) must be submitted by the Design-Builder to the City at the completion of Final Design for each component outlining any changes and how they respond to, and achieve, the SUI key values, goals and objectives.

1. Components include:

a. Llew Lawrence Operations and Maintenance Facility

b. 23 Avenue LRT Underpass

c. Twin Brooks Station

d. Heritage Valley North Station

e. Blackmud Creek LRT Bridge

f. Anthony Henday LRT Bridge

g. Utility Complexes (three) and TPSS

h. Stormwater Management Facility

i. Corridor (report for each point below)

    i. Corridor, Character Zones and Opportunity Areas - Landscape

    ii. Multimodal Transportation – SUP, Walks, Crosswalks, Roads

SECTION 2-2 – REFERENCE DOCUMENTS

A. The Infrastructure must be consistent with the following guidelines and standards:

1. City of Edmonton High Floor LRT Design Guidelines, available on the City's Website
2. City of Edmonton Design and Construction Standards, available on the City's Website
3. City of Edmonton Access Design Guide, 2021-11-29, available on the City's website
4. City of Edmonton Design Guide for a Safer City, December 1995, available on the City's website
5. City of Edmonton ETS Transit Centre Design, available as Disclosed Data
6. City of Edmonton Main Streets Guideline, available on the City's Website
7. City of Edmonton Winter City Design Guidelines - Transforming Edmonton into a Great Winter City, December 2016
8. City of Edmonton Low Impact Development Best Management Practices Design Guide
9. City of Edmonton Low Impact Development Construction, Inspection and Maintenance Guide, December 2014, available on the City's website
10. City of Edmonton Low Impact Development Construction and Maintenance Field Handbook, September 2016, available on the City's website
11. City of Edmonton ETS Brand Guide – Visual Identity, available as Disclosed Data
12. City of Edmonton Bylaw 18825 Public Tree Bylaw

B. The following documents should be referred to in order to gain an understanding of the context and potential future development opportunities for adjacent Lands:

1. City of Edmonton Transit Oriented Development Guidelines, February 15, 2012, available on the City's website
2. Heritage Valley Neighbourhood 14 Neighbourhood Structure Plan, August 2022, available on the City's website
3. Heritage Valley Town Centre Neighbourhood Structure Plan, April 2019, available on the City's website
4. Rutherford Neighbourhood Structure Plan, June 2019, available on the City's website
5. Richford Neighbourhood Structure Plan, May, 2021, available on the City's website
6. Twin Brooks Neighbourhood Structure Plan, October 2013, available on the City's website
7. Any other area and station area redevelopment plan within or adjacent to the LRT Corridor

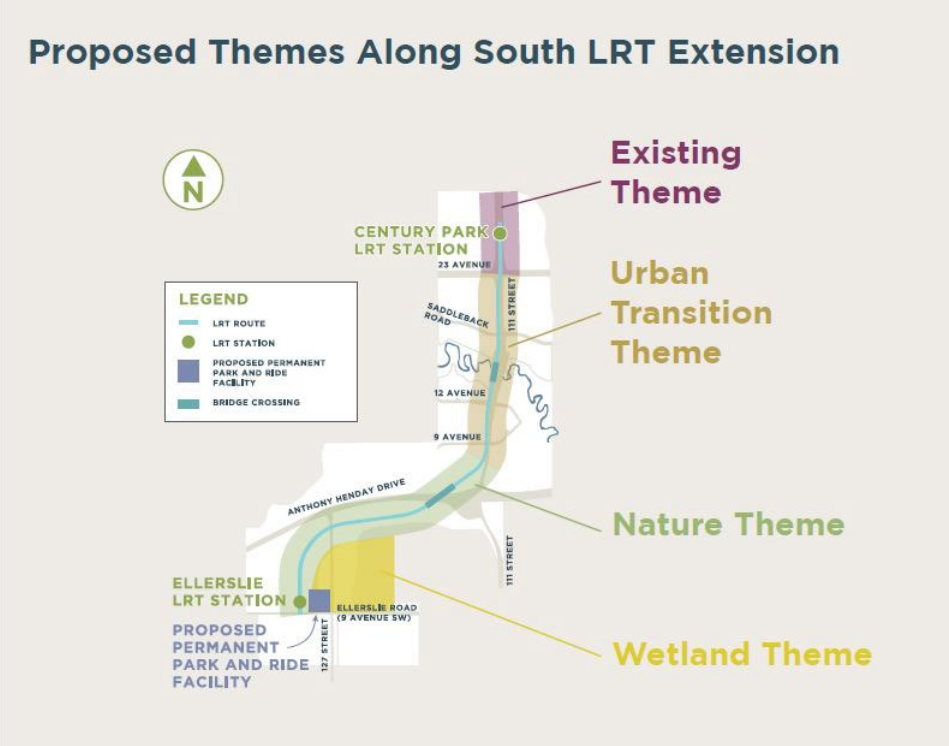
SECTION 2-3 – CHARACTER ZONES

2-3.1 INTRODUCTION

A. The look and feel of the public realm which the Infrastructure passes through has been classified into four distinct Character Zones, each with a theme. Each Character Zone has unique hardscapes and softscapes, history, and community connections, which are to be reflected and incorporated into the Design and Construction of the Infrastructure components located within the relevant Character Zone.

B. A Character Zone may contain an Opportunity Area. Individual components of the Infrastructure should respond to the context of the Opportunity Area and should be uniform within an Opportunity Area.

C. This Section 2-3 [*Character Zones*] outlines the Character Zones and sets out general requirements for each Opportunity Area found within a Character Zone. These general requirements are



complemented with more specific requirements throughout other Parts of this Schedule.

Image: Character Zones/Themes (2010)

2-3.2 ZONE A: URBAN CHARACTER ZONE

A. The Urban Character Zone is an existing thematic zone that extends from Century Park Station to the south side of the intersection of 111 Street and 23 Avenue. This zone is urban, containing a transit hub, with TOD and commercial activity on the east side of 111 Street.

B. The Design-Builder's Design must:

1. Enhance existing pedestrian connectivity within and between the established vehicle-oriented commercial and retail land uses to the northeast and southeast along with those of the low-density residential areas that back onto arterial roads to the northwest and southwest.

2. Add new pedestrian connections to existing destinations and the ongoing Century Park high-density development expansion.

2-3.2.1 23 Avenue Opportunity Area

A. The 23 Avenue Opportunity Area is the area surrounding the intersection of 23 Avenue and 111 Street. The redevelopment of the Century Park site, a former suburban shopping mall, into a high-density residential site is influenced by LRT expansion and development. This is a major intersection and will support the LRT with an underpass, vehicular and pedestrian traffic at-grade, and potentially a future rapid bus route running east/west on 23 Avenue.

B. The Design-Builder's Design of the 23 Avenue Opportunity Area must:

1. Include Pedestrian Priority Zones (PPZ) across 23 Avenue and 111 Street (four pedestrian crossings in total) as described in Section 3-2.3.3.1.O [*Streetscape*]. The PPZ will be designed and constructed to reflect the Character Zone's urban green spaces with direct pedestrian connections across roadways, and to surrounding neighbourhoods, recreational areas, sidewalks, SUPs, and amenity spaces.

2. Provide an enhanced experience for LRT Patrons through the use of textures on the portal walls as the LRV enters and leaves the 23 Avenue underpass, and the use of an ornamental landscape.

3. Include new boulevards and medians with a combination of trees, shrubs, and sod to contribute to the urban park setting of the Character Zone.

2-3.3 ZONE B: URBAN TRANSITION CHARACTER ZONE

A. Urban Transition Character Zone extends from the south side of the intersection of 23 Avenue and 111 Street to south of the intersection of 9 Avenue and 111 Street. This zone transitions from an urban to a suburban landscape.

B. The Design-Builder's Design of the Urban Transition Character Zone must:

1. Leverage the LRT Corridor to support existing stable residential and commercial developments.

2. Provide a variety of landscape transitions going south from 23 Avenue, from an urban area through a suburban residential area, the Blackmud Creek River Valley, a second suburban residential area (Twin Brooks) and a natural zone south of 9 Avenue.

2-3.3.1 Saddleback Road Opportunity Area

A. The Saddleback Road Opportunity Area is located at the intersection of Saddleback Road/19 Avenue and 111 Street. It is characterized by a low scale, low-density residential development on the east

side and a mix of residential uses on the west side. This intersection is the main entrance to neighbourhoods on either side of 111 Street.

B. The Design-Builder's Design of the Saddleback Road Opportunity Area must:

1. Include a PPZ at the intersection of 111 Street and Saddleback Road/19 Avenue, improve pedestrian connectivity along the LRT Corridor, and provide for pedestrian and cyclist access from the east.

2. Provide enhanced ornamental planting at the entrances to the adjacent neighbourhoods at Saddleback Road/19 Avenue.

3. Provide a naturalized LRT Corridor landscape south of the Saddleback Road intersection that reflects the Blackmud Creek River Valley character and vegetation.

2-3.3.2 Twin Brooks Opportunity Area

A. The Twin Brooks Opportunity Area is located between the intersections of 111 Street and 12 Avenue and 111 Street and 9 Avenue. It is characterized by low scale, low-density suburban residential development and a small neighbourhood commercial hub. This area has been identified as an area for change and future growth due to the development of the Twin Brooks Station.

B. The Design-Builder’s Design of the Twin Brooks Opportunity Area must:

1. Integrate the Twin Brooks Station into the adjacent neighbourhood with regards to scale, form, strong active mode connections, and an ornamental landscape.

2. Include a PPZ at the intersection of 111 Street and 9 Avenue and improve pedestrian connectivity along the LRT Corridor, and provide for pedestrian and cyclist access from the east to the station.

3. Include a PPZ at the intersection of 111 Street and 12 Avenue and improve pedestrian connectivity along the LRT Corridor, and provide for pedestrian and cyclist access from the east to the station.

4. Include visual and tactile treatments, such as additional scoring or patterning, to the SUP adjacent to the Twin Brooks Station. These treatments will identify and emphasise the intersections/connections from the SUP to the station.

5. Provide enhanced ornamental planting at the 9 Avenue and 12 Avenue entrances into the adjacent neighbourhoods.

6. Provide a streetscape along 111 Street that recognizes the transition to a more natural landscape both north and south of the station as well as potential future densification near the Twin Brooks Station.

2-3.4 ZONE C: NATURE CHARACTER ZONE

A. The Nature Character Zone extends from the south side of 9 Avenue through the TUC to north of Ellerslie Road along the LRT Corridor. This zone contains naturalized tree stands and grasslands.

B. The Design-Builder’s Design of the Nature Character Zone must:

1. Enhance the existing natural landscape along the LRT Corridor.

2. Enhance the edges of any retained and/or modified native/naturalized tree stands.

3. Provide an integrated naturalized landscape along the LRT Corridor and around the Heritage Valley North Station.

2-3.4.1 Heritage Valley North Station Opportunity Area

A. This area is a hub of transit infrastructure and includes an existing transit centre and park and ride facility. Specific initiatives that support growth opportunities, such as Transit Oriented Developments, may be targeted as growth opportunities adjacent to this area.

B. The Design-Builder's Design of the Heritage Valley North Station Opportunity Area must:

1. Provide an integrated pedestrian streetscape environment for all users.

2. Seamlessly integrate the LRT station into the existing site while complementing the transit centre and park and ride facility.

3. Provide opportunities for pedestrian and cyclist connections to adjacent sites slated for future development.

4. Integrate LID features within the site that, if required, connect to the existing LID system in the Park and Ride facility.

2-3.5 ZONE D: WETLAND CHARACTER ZONE

A. The Wetland Character Zone encompasses an area east of the trackway that consists of natural grassland and a large, naturalized tree stand located south of Anthony Henday Drive and west of current 127 Street. This area is west of the MacEwan Neighbourhood. In addition, the first stage of the Heritage Valley Park and Ride facility is found in this zone and incorporates an extensive LID stormwater management system, including a stormwater management pond.

B. The Design-Builder's Design of the Wetland Character Zone must:

1. Support the wetland theme through the use of stormwater management and LID features, and a naturalized planting palette.

2. enhance the existing naturalized tree stand as part of the Llew Lawrence OMF screening.

SECTION 2-4 – CRIME PREVENTION THROUGH ENVIRONMENTAL DESIGN (CPTED)

A. This Section 2-4 [*Crime Prevention Through Environmental Design (CPTED)*] sets out the requirements for Crime Prevention Through Environmental Design.

B. The Design and Construction of the Infrastructure must apply CPTED principles as set out in the City's Design Guide for a Safer City, the HFD Chapter 15 – "Safety and Security", and this Section 2-4 [*Crime Prevention Through Environmental Design (CPTED)*].

C. The Design-Builder must submit a report to the City no later than 12 months after the Effective Date confirming how CPTED principles will be applied to the Project, including but not limited to the following:

1. provision of information from site visits, including a record of observed existing conditions and context along the LRT Corridor;

2. identification and documentation of areas of concern and provision of mitigation recommendations for potential incorporation into the Project;

3. identification and documentation of possible impacts of the Infrastructure on the existing adjacent Lands, and provision of mitigation recommendations for potential incorporation into the Project;

4. review of the local crime and safety context for each area, utilizing the Neighbourhood Crime Map from the Edmonton Police Service website, and provision of mitigation recommendations for potential incorporation into the Project; and

5. documentation and reporting on how areas of concern and possible impacts will ultimately be resolved and mitigated in the detailed design.

2-4.1 NATURAL ACCESS CONTROL

A. The Design-Builder must provide natural access control through the use of architectural, landscaping, and structural elements to discourage access to areas for uses other than those intended, by:

1. designing indoor and outdoor spaces to discourage public access into dark and unmonitored areas;

2. providing visual cues to prevent unauthorized pedestrian and vehicular access;

3. using lighting at night to define pedestrian areas and pathways; and

4. where the use of items 1, 2 and 3 are not feasible, employing target hardening techniques.

2-4.1.1 Natural Boundaries

A. The Design-Builder must provide territorial reinforcement, through use of physical cues to identify and reinforce secure or restricted areas, by:

1. providing clearly marked transitional zones to acknowledge movement into a restricted space and clearly define the boundaries of the restricted space;

2. using elements such as signage, landscaping, tactile surfaces, low walls, artwork, seating, and similar elements to define desired movement areas; and

3. where the use of items one and two are not feasible, employing target hardening techniques, such as prohibiting entry or access with locks.

2-4.1.2 Natural Surveillance

A. The Design-Builder must provide natural surveillance through use of features that maximize visibility of platforms, stations, parking areas, sidewalks and pathways, building perimeters, and building entrances, by:

1. Designing site elements (landscaping, walls, bridges, guideway ramps, piers, etc.) to eliminate or minimize hidden places or areas for concealment such as hidden corners, blind spots and bends that create places of concealment or limit choices.

2. Maximizing transparency of Stations to allow observation of activity within and outside of the Structure.

3. Designing building facades to achieve a minimum of 50% transparency and using glazing to encourage passive surveillance of exterior areas.

4. Avoiding recesses, alcoves and concealed areas suitable for hiding.

5. Avoiding dead end corridors and areas having only one exit.

6. Placing services, such as Smart Fare Vending Machines, bicycle racks, and emergency phones in safe locations that are easily observed from other locations on the site.

7. Locating areas, such as accessible parking, confined circulation systems (such as guideway ramps, lifts, escalators and stairs) and gathering places, where they are easily observed.

8. Creating spaces with large fields of vision and long, uninterrupted sight lines.

9. Maximizing natural lighting of areas during daylight hours.

10. Providing adequate nighttime lighting to minimize shadows and glare.

SECTION 2-5 – PUBLIC ART

A. The Design-Builder shall be responsible for participating in the Public Art process and coordinating with the City and the Edmonton Arts Council as part of the Work in accordance with this Schedule. Following completion of the Public Art Call and once the full Public Art concepts and scopes are confirmed, integration of the Public Art including, where applicable, the design and installation of Public Art shall be specified as part of a Change pursuant to Schedule 13 [*Changes*]. Public Art integration for the Project will follow one of two distinct processes depending upon the type and location of the art opportunity:

1. An integrated process where the Public Art is integrated into the Project and requires coordination, procurement and installation by the Design-Builder. In this process the installation of art as required by the artist on or within any facilities/structures that are part of the Project scope will be by the Design-Builder. The Design-Builder must undertake the Design and Construction of any attachments, supports, foundations, and services or utilities for Public Art that is not integral to the artwork, unless otherwise noted in this Section.

2. An independent process whereby art is installed by an Other Contractor retained by the City on the site after Construction Completion. In this process all Public Art calls, site design and supporting facilities or structures such as foundations, grading, services are provided through the Edmonton Arts Council.

B. The City has identified four Public Art areas, each with one or more opportunity locations for various types of Public Art, details of which are provided in Table 2-5.1 Public Art Opportunities. The details in Table 2-5.1 are representative of all potential locations and types of art considered for the Project. Actual locations and types of Public Art will be determined through the Public Art process as described in Section 2-5.E.1.

Table 2-5.1: Public Art Opportunities

Public Area 1 – 23 Avenue Underpass and 111 Street Intersection		
Location	**Type**	**Installation By**
23 Avenue LRT Underpass **Opportunity 1** Interior walls	Panels or Paint - Applied to wall surface (3 mm maximum thickness) complete with lighting	Panels by Design-Builder. Paint by Artist Dedicated lighting for panels/paint and electrical services by Design-Builder
23 Avenue LRT Underpass **Opportunity 2** Interior - lighting	Lighting – art lighting fixtures attached to underpass surface	Art lighting installed by Design-Builder Electrical Services by Design-Builder
23 Avenue LRT Underpass Portal Walls **Opportunity 1** Walls facing track – north and south sides of underpass	Panels attached to surface or cast in place	Design-Builder
Median Island south of 23 Avenue	Sculpture	Foundation by Design-Builder Sculpture installed by others
Corner Cut – NE corner of 23 Avenue and 111 Street	Sculpture	Foundation by Design-Builder Sculpture installed by others

Public Area 1 – 23 Avenue Underpass and 111 Street Intersection		
Location	**Type**	**Installation By**
Intersection		
Corner Cut – NW corner of 23 Avenue and 111 Street	Sculpture	Foundation by Design-Builder Sculpture installed by others
Corner Cut – SW corner of 23 Avenue and 111 Street	Sculpture	Foundation by Design-Builder Sculpture installed by others
Public Art Area 2 – Anthony Henday LRT Bridge and Llew Lawrence OMF		
Anthony Henday LRT Bridge Opportunity 1 Painted Arches	Paint applied to surface, possibly during fabrication (dependent on process)	TBD based on fabrication process
Anthony Henday LRT Bridge Opportunity 2 Illumination of Arches	Lighting	Integration of Artist Design and electrical servicing by Design-Builder
Llew Lawrence Operations and Maintenance Facility Opportunity 2 Ornamental fence/screen on north edge of OMF site	Stand alone or attached to Security Fence	by others
Public Art Area 3 - Stations		
Twin Brooks Station Full Colour Ceramic Frit Glass	Integrated into structure. Design only by Artist.	Design-Builder – including fabrication
Heritage Valley North Station Full Colour Ceramic Frit Glass	Integrated into structure. Design only by Artist.	Design-Builder– including fabrication

Public Art Area 4 - Fencing			
Location	**Opportunities**	**Type**	**Installation By**
Safety Fence	Various locations to be determined.	Omega Fence – Replacement fence panels or art attached to existing panels	by others

C. Additional Public Art opportunities and locations may be proposed by the Design-Builder at the Public Art integration meeting 1 described in Section 2-5.E.1.

D. Each Public Art opportunity must be fully scheduled using logic based scheduling, complying with all scheduling requirements in this Section 2-5 [*Public Art*] and fully aligned to, compliant with, integrated into and provided in summary as an appendix to the Construction Schedule. The first version of this Public Art schedule for each Public Art opportunity is to be submitted both as a separate Submittal

and as part of the Preliminary Construction Schedule and upon acceptance by the City of the Public Art related dates this becomes the Preliminary Public Art Integration Schedule for each Public Art opportunity (the "Preliminary Public Art Integration Schedule"). An updated Public Art integration schedule for each Public Art opportunity is required pursuant to Section E-8 of this Schedule and must be submitted as a separate Submittal for endorsement in addition to being integrated in the latest applicable Construction Schedule and Schedule Update (the "Public Art Integration Schedule). The Preliminary Public Art Integration Schedule, submitted as part of the Construction Schedule by the Design-Builder must:

1. Identify a Public Art Lead from the Design-Builder who is responsible to work with the City and the Edmonton Arts Council on the integration of Public Art within the Project including coordination, facilitation and documentation of the Public Art process including all meetings, unless otherwise noted in this Section.

2. Identify a design window and a separate art installation/delivery window for each Public Art opportunity within the Preliminary Public Art Integration Schedule that does not impact the critical path for the Construction. The Design-Builder must provide this information as part of each regular Schedule Update.

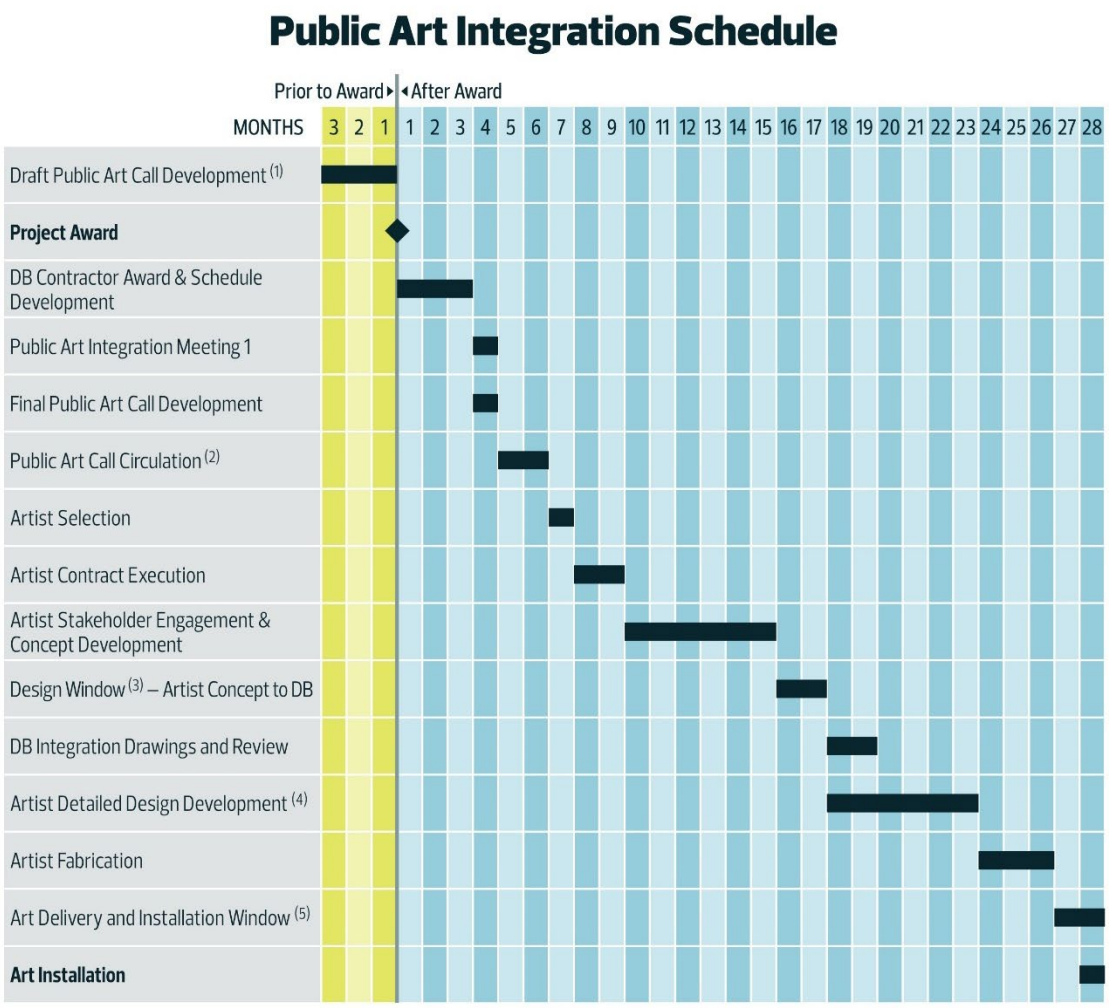
    a. Each Public Art design window must provide a timeline for the development and integration of the Public Art element(s) into the detailed design of the facility/structure/site and include a start and end date with the widest possible opportunity for the receipt of requirements from the artist.

    b. Each Public Art installation/delivery window must provide the widest possible opportunity for installation/delivery of the applicable work of Public Art acceptable to the City, provided that no Public Art installation/delivery window:

        i. commences earlier than the latest applicable date accepted by the City in the Preliminary Public Art Integration Schedule and the updated Public Art Integration Schedule.

        ii. ends before the latest applicable date accepted by the City in the Preliminary Public Art Integration Schedule and the Public Art Integration Schedule.

E. The Preliminary Public Art Integration Schedule provided by the Design-Builder must incorporate the activities E.1 through E.7 of this Section 2-5 [*Public Art*] at a minimum and must include dates and the minimum timelines for each Public Art opportunity provided in this Section. The schedule start date shall be the Effective Date, and the activities must occur consecutively as shown in Figure 2-5.1 but may have time periods where no activity related to the Public Art opportunity.



(1) Draft Public Art Call development starts before project award.

(2) Public Art Calls are dependent on the design window provided by the DB and when site is anticipated to be ready for delivery / installation.

(3) Design Window - length varies dependent on facility/structure/site design requirements.

(4) Artist Detailed Design Development – length varies dependent on art opportunity.

(5) Art Delivery and Installation Window – dependent on facility/structure/site construction timeline.

Figure 2-5.1: Example of Public Art Integration Schedule

1. The first Public Art integration meeting will include the Design-Builder's Public Art Lead, City representatives and Edmonton Arts Council representatives and must occur within 1 month after schedule submission to review and confirm the Preliminary Public Art Integration Schedule. Additional meetings between the Public Art Lead, other Design-Builder representatives as required, the City, and the Edmonton Arts Council will follow as required in order to define roles, responsibilities and processes for the incorporation of Public Art; keep all parties apprised of the Public Art process/schedule/status and coordinate the design, installation, and integration of the Public Art into the Infrastructure and open spaces. This includes site meetings as appropriate.

2. Final Public Art Call Development will be undertaken by Edmonton Arts Council, and it is expected that 1 month will be required to finalize the Public Art call. Public Art call development will begin prior to the Effective Date.

3. Public Art call circulation will be undertaken by Edmonton Arts Council as is expected to take 2 months. The City, with the support of the Edmonton Arts Council, will manage and administer the Public Art contracts, including all communications with the artists, such as Public Art calls and the scheduling of installation and delivery of the Public Art.

4. Artist selection will be undertaken by Edmonton Arts Council and is expected to take 1 month.

5. Artist contract execution will be undertaken by Edmonton Arts Council and is expected to take 2 months.

6. Artist stakeholder engagement and concept development will be undertaken by Edmonton Arts Council and is expected to take 6 months.

7. The artist's concept will be provided to the Design-Builder by Edmonton Arts Council within 2 weeks of concept development completion. The artist's concept design for the Public Art opportunity will be provided to the Design-Builder no later than the dates determined by the design window indicated in the accepted Preliminary Public Art Integration Schedule for the respective Public Art opportunity; and will include all applicable Public Art call information.

8. A Public Art Integration Schedule must be submitted by the Design-Builder within 1 month after the artist's concept is provided to the Design-Builder. The Design-Builder must coordinate with the Edmonton Arts Council in developing the comprehensive Public Art Integration Schedule for the Design and Construction of each Public Art opportunity. Each Public Art Integration Schedule must:

    a. clearly identify the design window and installation/delivery window for the applicable Public Art opportunity;

    b. include the public art process steps outlined in E.1 through E.12;

    c. include a narrative statement specifying all information reasonably required by the Design-Builder to permit the full and proper integration of the Public Art into the applicable component of the Infrastructure, including, but not limited to:

        i. design information;

        ii. structural loading requirements;

        iii. installation requirements, erection plans and connection details;

        iv. details of required Utility connections and other services;

        v. the latest date(s) by which each piece of information is reasonably required to avoid impacting the critical path for the Construction, provided such date(s) are not less than

45 calendar days after the date on which the applicable Public Art Integration Schedule is agreed to, and

vi. provide a timeframe for the artist's review and comments on the materials and installation details developed by the Design-Builder based on the information provided above. A minimum of 1 month will be required for the review and may include a meeting.

9. Integration Drawings prepared by the Design-Builder and reviewed by the artist must provide materials and installation details for the art opportunity. The Design-Builder must submit to the City within 60 days of the submission of each Public Art Integration Schedule or a longer period as accepted by the City:

   a. all the drawings and images reflecting the Design-Builder's Design for the integration of the art;

   b. all specifications that describe the Design-Builder's Design and installation methodology; and

   c. records of any discussions between the Design-Builder and the Edmonton Arts Council/City to ensure a full understanding of the information provided to and the agreement between parties.

10. Artist detailed design development will be managed by Edmonton Arts Council.

11. Art fabrication will be managed by Edmonton Arts Council unless otherwise noted above and will commence up to 6 months prior to the installation and delivery window. This time will vary depending upon the final design.

12. Art Installation will be undertaken or managed by Edmonton Arts Council and/or the Design-Builder as noted above during the installation and delivery window and is expected to take up to 1 month.

F. The City, with the Edmonton Arts Council, will manage and administer its Public Art contracts, and manage:

   1. all communications with the artists; and

   2. the scheduling of installation and delivery of the Public Art.

G. The Design-Builder must not:

   1. advance the start and end date of the applicable Public Art design and/or installation and delivery windows to a date that is earlier than that set out in the Preliminary Public Art Integration Schedule for the applicable work of Public Art;

   2. defer the start and end date of the applicable Public Art installation/ delivery window by more than 360 calendar days from that set out in the Preliminary Public Art Integration Schedule for the applicable work of Public Art, except to reflect any extension of any such dates agreed or determined in accordance with this Agreement;

   3. alter any of the dates specified in an accepted Public Art Integration Schedule, without the prior acceptance of the City, which acceptance may be granted or withheld at the City's discretion.

H. The Design-Builder must provide the City, when and as required, with:

   1. access to electronic ".dwg" format files showing the current state of applicable Designs;

   2. specifications of materials that Public Art may be attached to;

3. access parameters for Public Art locations; and

4. any other information required by the City to provide the Public Art.

I. The Design-Builder must design and construct the Infrastructure such that:

1. it can be safely operated in compliance with all other Requirements set out in Schedule 5 [*D&C Performance Requirements*] (including clear camera angles), notwithstanding:

a. any delay in delivery, damage to, incompatibility of, or other lack of availability of any Public Art; and

b. vandalism or other damage to any Public Art, requiring removal and repair or replacement thereof.

2. any Public Art can be readily accessed, maintained and removed without adverse impacts to the availability of the Infrastructure.

J. The Design-Builder must protect Public Art against damage from the environment and vandalism from the time that is delivered to the Design-Builder and/or site to the time it is turned over to the City at the Construction Completion Date.

K. The Design-Builder must provide storage for art and payment of related fees including insurance and transportation should the Design-Builder defer the start and end date of the Public Art installation more than 14 calendar days after the applicable delivery and installation window. The art will be the responsibility of the Design-Builder until the site is ready for the Public Art installation.

L. The Design-Builder may proceed with the fabrication and installation of standard infrastructure if the information for the applicable Public Art that is to be applied to the elements has not been provided by the City to the Design-Builder by the end date of the art delivery window as specified in the applicable Public Art Integration Schedule, unless otherwise agreed upon.

M. The Design-Builder must provide the City with unimpeded and uninterrupted access to the relevant Infrastructure for the Public Art installation by Other Contractors.

N. The Design-Builder must notify the City of any damage to Public Art which occurs during transport or installation by the Design-Builder within 8 hours of discovery.

1. No attempt must be made by the Design-Builder to repair any damage to Public Art.

2. Damages will be assessed and repaired by the Edmonton Arts Council.

3. The Design-Builder will be responsible for any costs incurred by the City in performing any such repairs and payment must be made upon receipt of an invoice from the Edmonton Arts Council.

SECTION 2-6 – EDMONTON DESIGN COMMITTEE (EDC)

A. The Capital Line South LRT Extension Final Design must be reviewed by the EDC during the design process.

   1. A schedule of formal presentations for the EDC must be submitted by the Design-Builder to the City within 120 days of Effective Date. The schedule for EDC meetings must reflect the Design-Builder's proposed detailed design schedule up to its completion with consideration for the design phasing of all structures, facilities, LRT Corridor, and all related components.

   2. The Design-Builder must organize and attend presentation meetings with the EDC as required to ensure that all relevant structures, facilities, and LRT Corridor components are provided for EDC consideration. Representatives from the City should attend all EDC meetings.

B. The Design-Builder must provide draft submission materials to the City a minimum of 2 weeks prior to EDC submission date for review.

C. EDC meeting summaries are the responsibility of the Design-Builder and should be provided to the City within 2 weeks after each meeting.

D. Documentation of the Design-Builder design responses and intended actions derived from EDC direction must be submitted to the City within 4 weeks after each meeting for review. A meeting to discuss will be required to confirm direction. All EDC verbal and written comments received must be considered and responded to as required within the detailed design drawings and documents.

E. The Design-Builder must reference the Edmonton Design Committee Standards and Procedures, including Appendix A: EDC Principles of Urban Design (available on the City's website) and the SUI key values, goals and objectives described in Section 2-1 [*General Sustainable Urban Integration Requirements*].

F. Requirements for EDC submissions are found at: https://www.edmonton.ca/city_government/city_organization/edmonton-design-committee#:~:text=The%20Edmonton%20Design%20Committee%20(EDC)%20was%20established%20by%20City%20Council,key%20City%20of%20Edmonton%20projects.

SECTION 2-7 – NOT USED

SECTION 2-8 – BRANDING

A. The Design-Builder must be aware of and incorporate the requirements of the ETS Brand Guide which include applications on elements such as the Stations and the Llew Lawrence OMF. The ETS Brand Guide is provided as Disclosed Data.

SECTION 2-9 – LANDSCAPE ARCHITECTURE

2-9.1 GENERAL

A. This Section sets out Design and Construction requirements for all Landscaped Areas.

B. The Landscaped Areas must:

1. Reinstate the functional performance of existing landscaped and natural areas adjacent to the Project that are impacted during Construction.

2. Areas of isolated landscape disturbance must be restored to original conditions present prior to commencement of construction, and in accordance with the D&CS.

3. Provide a positive experience for neighbouring residents, pedestrians, cyclists, motorists, Patrons, and Passengers.

4. Display a higher level of landscape architecture that also requires a reduced level of maintenance after establishment than that of typical arterial roadway corridors in the City.

5. Integrate the Infrastructure into existing neighbourhoods.

6. Support the City's SUP and sidewalk network by providing support amenities for pedestrians, cyclists, and Patrons.

7. Maximize the number of trees retained and planted along the LRT Corridor by supporting and integrating the landscape architecture with the Infrastructure design.

2-9.2 LANDSCAPE ARCHITECTURE DESIGN STANDARDS

A. All landscape architecture design components and layouts within the Landscaped Areas must comply with the requirements, guidelines, and standards in the D&CS Volume 5 Landscaping and the HFDG.

B. LID facilities must incorporate the best practices and strategies in accordance with the City of Edmonton Low Impact Development Best Practices Design Guide, the City of Edmonton Low Impact Development Construction, Inspection & Maintenance Guide and the D&CS Volume 3 – Drainage, Section 17 LID Facility Design.

C. The SWMF design components and layouts must comply with the D&CS Volume 3 – Drainage, Section 16 Stormwater Management Facility Design.

2-9.3 SUSTAINABILITY

A. The Design and Construction of the Landscaped Areas must achieve the SUI key values, goals and objectives described in Section 2-1 [*General Sustainable Urban Integration Requirements*] and incorporate sustainable best practices to the fullest extent possible for this Project.

2-9.4 LRT CORRIDOR LANDSCAPED AREAS

2-9.4.1 LRT Corridor Landscaped Area Definitions

A. Figure 2-9.1 [*LRT Corridor Landscaped Areas*] illustrates and defines the LRT Corridor Landscaped Areas along the LRT Corridor. These Landscaped Areas are referenced throughout this Section.

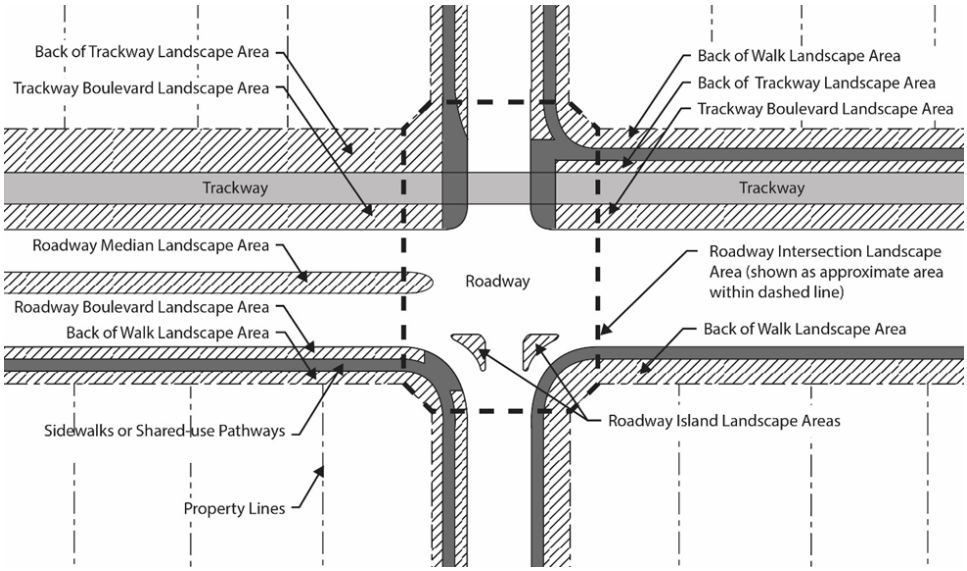


Figure 2-9.1: LRT Corridor Landscaped Areas

2-9.4.2 General Planting Requirements for LRT Corridor Landscaped Areas

A. Landscape treatments must be provided for the LRT Corridor Landscaped Areas based on the boulevard/median width available along the LRT Corridor as shown in Table 2-9.4.2 [*Planting Requirements for LRT Corridor Landscaped Areas*].

B. Area specific landscape requirements for each Character Zone and Specialty Area are set out in Section 2-9.6 [*Character Zones and Specialty Areas*] and Table 2-9.4.2 [*Planting Requirements for LRT Corridor Landscaped Areas*].

Table 2-9.4.2: Planting Requirements for LRT Corridor Landscaped Areas

Boulevard/Median Width	Planting Requirements
Roadway Boulevard Landscaped Areas	
≥ 2.6 m width	Street Trees, shrub beds and/or boulevard and median plant materials, including concrete verge along the back of curb
≥ 2.6 m width	Street Trees in sod
1.75 - 2.6 m width	Street Trees and/or boulevard and median plant materials in a shrub bed, including concrete verge along the back of curb
1.2 - 1.75 m width	Boulevard and median plant materials in hardscape or sod
< 1.2 m width	Hardscape only
Trackway Boulevard and Back of Trackway Landscaped Areas	
≥ 6.0 m	Canopy trees, shrub beds and/or boulevard and median plant materials. Include concrete verge for boulevard
≥ 4.0 m	Columnar trees, shrub beds and/or boulevard and median plant materials. Include concrete verge along the back of curb for boulevard
≥ 2.0 m	Shrub bed and/or boulevard and median plant materials. Include concrete verge for boulevard
< 2.0 m width	Hardscape only for boulevard Shrub bed and/or sod for Back of Trackway Follow HFDG for trackway setbacks for all widths
Roadway Median Landscaped Areas and Roadway Island Landscaped Areas	
≥ 3.2 m in width	Street Trees, shrub beds and/or boulevard and median plant materials, including concrete verges on both sides of median/island
3.2 m to 2.75 m width	Shrub bed and/or boulevard and median plant materials, including concrete verges on both sides of median/island
< 2.75 m width	Hardscape and/or boulevard and median plant materials, including concrete verges on both sides of median/island
Roadway Intersection Landscaped Areas	
Varies	Shrub and perennial beds, including concrete verges

2-9.5 REQUIRED PLANTING SETBACKS

A. Tree, shrub and perennial setbacks to Utilities, property lines, walkways, Roadways, Trackway, SUPs and sidewalks must be provided in accordance with the HFDG and the D&CS.

B. Without limiting Section 2-9.4.2 [*Planting Requirements for LRT Corridor Landscaped Areas*] of this Schedule, tree setbacks must be provided to Roadways and Trackway in accordance with Table 2-9.5 Tree Planting Setbacks.

Table 2-9.5: Tree Planting Setbacks

Scenario	Tree Setbacks from Roadway and Trackway
Between north of 23 Avenue to construction boundary south of 9 Avenue	Minimum: 2.0 m for Arterial Roadway Follow HFDG for Trackway setbacks.
Between south of Anthony Henday to Heritage Valley North Station and south construction boundary	Minimum: 2.0 m for Arterial Roadway Follow HFDG for Trackway setbacks.
From the LRV Dynamic Envelope (DVDE)	For Canopy Trees: at least half the width of Canopy Tree at maturity* For Columnar Trees: at least 2 m or half the width of the Columnar Tree at maturity*, whichever is greater, +1 m to allow for service space. Follow HFDG for Trackway setbacks. *Dimensions of tree at maturity are according to D&CS Volume 5 – Landscaping, Appendix F**:** Tree Diversity and Approved Species Spread and Spacing.

C. All tree setback measurements identified in Table 2-9.5 *[Tree Planting Setbacks*] are measured from centre of trunk to face of curb.

2-9.5.1 General Street Tree Planting Requirements

A. Street Trees must be provided in LRT Corridor Landscaped Areas and meet the requirements of Table 2-9.4.2 [*Planting Requirements for LRT Corridor Landscaped Areas*] and Table 2-9.5 [*Tree Planting Setbacks*].

B. Street Trees must be spaced according to the mature tree canopy sizes listed in D&CS Volume 5 – Landscaping, Appendix F**:** Tree Diversity and Approved Species Spread and Spacing.

C. Street Trees should not be provided at intersections, crosswalks, or driveways where sightlines are determined to be impeded in accordance with the D&CS, HFDG, and the Safety and Security Certification Program.

D. Where existing utilities within required setbacks are parallel to, and in direct conflict with, a potential continuous row of Street Trees, the trees should be reallocated to segments of boulevards, medians, or islands.

E. The total number of trees shall be 355 Conifer Trees (including Conifers and Columnar Conifers) and 561 Deciduous Trees (including Deciduous, Columnar Deciduous and Ornamental Deciduous), for a total of 916 at a minimum.

F. Notwithstanding Section 2-9.4.2 *[General Planting Requirements for LRT Corridor Landscaped Areas]* of this Schedule, all street lighting power lines conflicting with Street Trees must be relocated to accommodate Street Tree planting.

G. Roadway Boulevard Landscaped Areas, Trackway Boulevard Landscaped Areas, Roadway Median Landscaped Areas, and Roadway Island Landscaped Areas must have a 500 mm concrete verge adjacent to shrub beds.

H. Verges must be in accordance with the D&CS.

I. Trees within the roadway must be planted as shown in the D&CS - Detail LA113 [*Typical Tree Root Trench*]. Trees within the roadway and planted with shrubs must be planted as shown in the D&CS - Detail LA108A [*Typical Tree and Shrub Planting Bed*].

2-9.5.2 Street Tree Planting in Roadway Boulevard Landscaped Areas

A. The Design-Builder must provide Street Trees in all Roadway Boulevard Landscaped Areas except where:

1. an existing tree is located in the applicable Roadway Boulevard Landscaped Area, in which case the Street Tree patterning must accommodate the existing tree; or

2. the required setback to a utility crossing, driveway, walkway, bus pad, or structure prevents tree planting, in which case tree spacing may be adjusted by up to 3 m to accommodate setbacks. Where two or more setback conflicts overlap or occur concurrently along a section of the LRT Corridor, a maximum of one Street Tree may be omitted from the affected section.

B. Street Trees in the Roadway Boulevard Landscaped Areas must be:

1. Canopy Trees

2. Planted in a continuous row along the full length of the Roadway Boulevard Landscaped Area

3. Follow the road alignment

2-9.5.3 Tree Planting in Back of Walk and Back of Trackway Landscaped Areas

A. The Design-Builder must provide Trees in all Back of Walk Landscaped Area and Back of Trackway Landscaped Area except where:

1. an existing tree is located in the applicable Back of Walk Landscaped Area and Trackway Landscaped Area, in which case the Tree patterning must be adjusted to accommodate the existing tree; or

2. the required setback to a utility crossing, driveway, walkway or structure prevents tree planting, in which case tree spacing may be adjusted by up to 3 m to accommodate setbacks. Where two or more setback conflicts overlap or occur concurrently along a section of the LRT Corridor, a maximum of one Tree may be omitted from the affected section; or

3. the Back of Walk Landscaped Area width is less than 1.5 m, where the width is measured from back of walk to adjacent property line or existing fence – whichever is closest; and

4. trees in the Back of Walk and Back of Trackway Landscaped Area must be:

a. Canopy Trees, and where space permits, coniferous trees.

b. Planted in a continuous row along the full length of the Back of Walk Landscaped Area and Trackway Landscaped Area. Trees may be staggered.

c. Follow the Back of Walk/Trackway alignment.

2-9.5.4 Street Tree Planting in the Roadway Median and Roadway Island Landscaped Area

A. The Design-Builder must provide Street Trees in the Roadway Median Landscape Area and Roadway Island Landscaped Area except where:

1. an existing tree is located in the applicable Roadway Median Landscaped Area or Roadway Island Landscaped Area, in which case Street Tree patterning must be adjusted to accommodate the existing tree; or

2. the required setback to a utility crossing, driveway, walkway or structure prevents tree planting, in which case tree spacing may be adjusted by up to 3 m to accommodate setbacks. Where two or more setback conflicts overlap or occur concurrently along a section of the LRT Corridor, a maximum of one Street Tree may be omitted from the affected section; and

3. Street Trees in the Roadway Median Landscaped Area and Roadway Island Landscaped Area must be:

a. Canopy Trees; and

b. planted in a continuous row along the full length of the Roadway Median Landscaped Area or Roadway Island Landscaped Area.

2-9.5.5 Street Tree Planting in the Trackway Boulevard Landscape Area

A. The Design-Builder must provide Street Trees in the Trackway Boulevard Landscaped Area except where:

1. an existing Street Tree is located in the applicable Trackway Boulevard Landscaped Area, in which case Street Tree patterning may be adjusted to accommodate the existing tree; or

2. the required setback to a utility crossing, driveway, walkway, or structure prevents tree planting, in which case tree spacing may be adjusted by up to 3 m to accommodate setbacks. Where two or more setback conflicts overlap or occur concurrently along a section of the LRT Corridor, a maximum of one Street Tree may be omitted from the affected section; and

3. trees in the Trackway Boulevard Landscaped Area must be in accordance with Section 2-9.5 *[Required Planting Setbacks]* of this Schedule and as follows:

a. the Design-Builder must provide Canopy Trees within the Trackway Boulevard Landscaped Area if the width of the Trackway Boulevard Landscaped Area is sufficient to accommodate Canopy Trees; otherwise, provide Columnar Trees within the Trackway Boulevard Landscaped Area;

b. Canopy and/or Columnar Trees should be planted in a continuous row along the full length of the Trackway Boulevard Landscaped Area, following the alignment of the track barrier, and

c. Columnar Trees should be planted in groups of at least three trees with a 9 m maximum space between groups of trees.

2-9.5.6 Pedestrian Priority Zone Landscape Design

A. The landscape design in all PPZ must be distinct from other Landscaped Areas along the LRT Corridor, highlighting the applicable Stations and immediately adjacent Intersection(s)/crosswalks.

B. Landscape design differentiation may be created by modifications in planting patterning, layout design, and/or foliage and flower colour and texture.

C. Plantings must provide colour and texture through all four seasons, be multi-layered, and have an emphasis on small scale plantings.

2-9.6 CHARACTER ZONES AND SPECIALTY AREAS

2-9.6.1 Introduction

A. Each Character Zone and Specialty Area along the alignment is defined through overall planting design objectives and specific planting requirements.

B. Planting patterns and layout and acceptable species are described for each Character Zone and Specialty Area.

2-9.6.2 Plant Selection Requirements

A. A proposed plant list for each of the Character Zones and Specialty Areas must be submitted to the City at the first review. Approval of these lists must be received from the City prior to development of the final plant list.

B. The proposed plant lists should be based on the design intent of the specific Character Zone or Specialty Area, area specific requirements and plant types as identified on the drawings. The selection of plant species must be based on Section 2-10.11 [*Plant Material*].

2-9.6.3 Zone A: Urban Character Zone Landscape Requirements

2-9.6.3.1 Location: Existing Century Park Station to the south side of 23 Avenue Intersection

A. This Section sets out landscape requirements from the existing Century Park Station to the south side of the intersection of 23 Avenue and 111 Street and adjacent areas.

2-9.6.3.2 Design Intent

A. The proposed design in this area must tie into the existing landscape design which includes hardscapes and repeating plant patterns. The landscaping in this zone must consist of planting schemes with strong symmetry and repeating planting patterns. Landscape integration and screening of the LRT underpass structure must be provided as well as retaining walls along the corridor.

B. The proposed landscape design consists of Street Trees, ornamental shrubs, and perennial planting in the corner planting beds, highlighting the PPZ, as described in Section 2-9.5.6 [*Pedestrian Priority Zones Landscape Design*] and the intersection.

2-9.6.3.3 Zone A: Specific Planting Requirements

A. Trees

1. The Design-Builder must provide, at a minimum, the following caliper trees in Zone A: Urban Character Zone. Trees must be planted in mulched shrub beds, no mow grass, or sod.

    a. 66 deciduous trees

b. 25 coniferous trees

c. Between 111 Street and 109 Street, on the north side of 23 Avenue, Street Trees may have been removed during antecedent work by others. The Design-Builder must provide replacement trees to match the quantity and species removed, at a minimum.

d. On 23 Avenue NW, west of 111 Street NW, Street Trees will require removal for the Construction of additional turning lanes. The Design-Builder must provide replacement trees to match the species removed if landscaping setbacks from new Infrastructure and from adjacent existing planting as defined in the D&CS can be met.

B. The Design-Builder must provide the following in Zone A.

Table 2-9.6.3.3: Zone A: Urban Character Zone Planting

Description	Square Metres (minimum)
Mulched Shrub Beds	2400
Mulched Shrub and Perennial Beds	2290
Naturalization No Mow Grass Area	4005

C. Sod

1. The remaining areas that are not planted with the above specified plant material must be planted with sod as per the D&CS Volume 5 Section 02920 Sod and Seed.

2-9.6.4 Zone B: Urban Transition Character Zone

2-9.6.4.1 Location

A. The Urban Transition Character Zone sets out landscape requirements for the area that extends from south side of the intersection of 23 Avenue and 111 Street to the north side of the intersection of 9 Avenue and 111 Street.

2-9.6.4.2 Design Intent

A. The proposed landscape design consists of Street Trees/Canopy Trees, ornamental shrubs, and perennial planting in the corner planting beds, highlighting the PPZ at Saddleback Road/19 Avenue, 12 Avenue and 9 Avenue, as described in Section 2-9.5.6 [*Pedestrian Priority Zones Landscape Design*]. The remainder of the corridor is predominantly no mow grasses with trees, many of which will be native, and, as the zone moves south, shall be planted in a natural, informal manner where space allows.

B. Blackmud Creek River Valley has been identified as a 'Sensitive Area'. Naturalization within Blackmud Creek River Valley must be provided as stipulated in Schedule 10 – [*Environmental Performance Requirements*].

C. The remaining portion of the existing tree stands adjacent to and within Blackmud Creek River Valley must be protected and maintained as per Section 2-12 [T*ree Retention, Removal and Protection/Preservation*]. The Design-Builder must provide protection and preservation of the retained tree stands impacted by antecedent work by others, including activities described in the "*111 Street EPCOR Construction Tree Removals and Preservation Plan (TRPP)"* available as Disclosed Data.

2-9.6.4.3 Zone B: Specific Planting Requirements

A. Trees

1. The Design-Builder must provide, at a minimum, the following trees in Zone B: Urban Character Transition Zone. Trees must be planted in mulched shrub beds, no mow grasses, or sod.

    a. 251 deciduous trees

    b. 67 coniferous trees

B. Shrubs, Perennials and Naturalization

1. The Design-Builder must provide the following in Zone B: Urban Transition Character Zone.

Table 2-9.6.4.3: Zone B: Urban Transition Character Zone

Description	Square Metres (minimum)
Mulched Shrub Beds	1780
Mulched Shrub and Perennial Beds	2535
Naturalization Beds	5090
Naturalization No Mow Grass Area	9320

C. Sod

1. The remaining areas that are not planted with the above specified plant material must be planted with sod as per the D&CS Volume 5 Section 02920 Seed and Sod.

2-9.6.5 Zone C: Nature Character Zone Requirements

2-9.6.5.1 Location

A. This zone runs along the LRT Corridor and extends from south of 9 Avenue and 111 Street Intersection over Anthony Henday Drive to Ellerslie Road and is adjacent to the Heritage Valley North Station and the Llew Lawrence OMF.

2-9.6.5.2 Design Intent

A. A naturalized planting approach must be used with the following exception:

1. Formal planting must be provided on the south corner of 9 Avenue and 111 Street intersection as part of the entrance into the community.

2-9.6.5.3 Zone C: Specific Requirements

A. Trees

1. The Design-Builder must provide, at a minimum, the following caliper trees in Zone C: Nature Character Zone. Trees must be planted in mulched shrub beds, no mow grassed areas, or sod.

    a. 2 deciduous trees

    b. 35 coniferous trees

B. Shrubs, Perennials and Naturalization

1. The Design-Builder must provide the following in Zone C: Nature Character Zone.

Table 2-9.6.5.3: Zone C: Nature Character Zone

Description	Square Metres (minimum)
Naturalization Beds	1680
Naturalized No Mow Grass Areas	32490

C. Sod

1. The remaining areas that are not planted with the above specified plant material must be planted with sod as per the D&CS Volume 5 Section 02920 Seed and Sod.

2-9.6.6 Zone D: Wetland Character Zone Requirements

2-9.6.6.1 Location

A. This zone includes the existing MacEwan tree stand on the east side of the Llew Lawrence OMF and a naturalized buffer planting on the north side of the MacEwan neighbourhood. The Llew Lawrence OMF site and the SWMF are located within this zone and are specified within Section 2-9.6.7 [*Specialty Areas (SA)*].

2-9.6.6.2 Design Intent - Retained Tree Stand Naturalization Planting

A. The remaining portion of the existing tree stand east of the Llew Lawrence OMF site and 127 Street must be protected and maintained as per Section 2-12 [*Tree Retention, Removal and Protection/Preservation*]. Rehabilitation of the edge of the tree stand on its west side adjacent to the Llew Lawrence OMF access road must occur as Naturalization planting. The rehabilitation of the tree stand edge must consist of:

1. Minimized grading as required for positive drainage.

2. Topsoil installation to provide suitable site conditions for grasses, whips and plugs.

3. Outside edge of retained tree stand: Installation of whips and plugs for a 2 m width band, adjacent to and along the length of the outside edge of the retained stand (within previously disturbed Lands due to tree removal) at a rate of two plugs/whips per square metre complete with Naturalization seed. Plugs/whips to be mulched with a minimum diameter of 300 mm at 50 mm deep.

4. Inside edge of retained tree stand: Installation of whips and plugs for a 3 m width band the length of the inside of the edge of the retained stand (within retained vegetation) at a rate of one plug/whip per square metre. Plugs/whips to be mulched with a minimum diameter of 300 mm at 50 mm deep.

B. When working in the vicinity of the tree stand, the Design-Builder must follow the procedures outlined in Section 2-12 [*Tree Retention, Removal and Protection/Preservation*]. The Design-Builder must provide protection and preservation of the retained tree stand.

2-9.6.6.3 Zone D: Specific Requirements

A. The Design-Builder must provide the following, at a minimum, in Zone D: Wetland Character Zone.

Table 2-9.6.6.3: Zone D: Wetland Character Zone

Description	Square Metres
North of MacEwan Neighbourhood Naturalization – Naturalized No Mow Grass within TUC.	18590
Outside Edge of Retained Tree Stand Naturalization	1030
Inside Edge of Retained Tree Stand Naturalization	1535
Naturalized No Mow Grass Areas	16880

B. The remaining areas that are not planted with the above specified plant material must be seeded with naturalized seed as per the D&CS Volume 5 Section 02920 Seed and Sod.

2-9.6.7 Specialty Areas (SA)

2-9.6.7.1 Specialty Area 1: Llew Lawrence Operations and Maintenance Facility Landscape Requirements

A. Location

1. This Section 2-9.6.7.1[*Specialty Area 1: Llew Lawrence Operations and Maintenance Facility Landscape Requirements*] sets out landscape requirements for the OMF south of Anthony Henday Drive and north of the Heritage Valley Transit Centre and Park and Ride.

B. Design Intent

1. A dense landscape buffer planting must be provided around the perimeter of the site. The planting should be principally coniferous trees to provide year-round screening. The proportion of coniferous to deciduous trees must be 80% to 20%.

2. Internal site plantings to be predominantly naturalized beds with trees and shrubs.

C. Site planting to enhance the building, staff areas, and parking lots must be provided.

D. A staff area must be provided in close proximity to the staff office entrance on the north-west side of the Llew Lawrence OMF building. This staff area must provide:

1. hard surfaced area, such as concrete or paving stone, for site furniture and anticipated staff activities and sized for one full shift of staff;

2. hard and soft (landscape) screening from operations and track areas; and

3. site furniture, such as, but not limited to: picnic tables, benches, waste receptacles, gas barbeque (including hookup), lighting, and enclosed/covered bike storage facilities to accommodate one full shift of staff.

E. Llew Lawrence OMF Specific Planting Requirements

1. Trees

a. The Design-Builder must provide, at a minimum, the following caliper trees in Specialty Area 1 – Llew Lawrence Operations and Maintenance Facility. Trees must be planted in mulched shrub beds, no mow grass areas, or sod.

b. 97 deciduous trees

c. 137 coniferous trees

2. Beds and Turf

a. The Design-Builder must provide.

Table 2-9.6.7.1: Specialty Area 1: Llew Lawrence OMF Site

Description	Total Square Metres
Mulched Shrub Beds	4640

3. Sod and Seed

a. A 2 m wide mowing strip along the edges of sidewalks must be sod.

b. The remaining areas that are not planted with the above specified plant material must be seeded with a naturalized seed mix as per the D&CS Volume 5 Section 02920 Seed and Sod, unless otherwise noted on the Design Drawings.

2-9.6.7.2 Specialty Area 2: Utility Complex/TPSS Landscape Requirements

A. Locations

1. This Section sets out landscape requirements for each UC and TPSS at the following locations:

a. Specialty Area 2A – Twin Brooks UC Landscape

b. The Twin Brooks UC is located on the northeast side of the intersection of 111 Street and 12 Avenue NW.

c. Specialty Area 2B - Anthony Henday TPSS Landscape

i. The Anthony Henday TPSS is located within the TUC south of Anthony Henday Drive, and west of the MacEwan Neighbourhood Stormwater Management Facility.

d. Specialty Area 2C - Heritage Valley North UC Landscape

i. The Heritage Valley North UC is located north of the Heritage Valley North Station on the west side of the LRT trackway.

B. Specialty Area 2D - OMF UC Landscape

1. The OMF Utility Complex is located east of the Llew Lawrence OMF building on the west side of 127 Street SW.

C. Overarching Design Intent

1. The landscape at each UC/TPSS location must visually integrate the UC/TPSS into the adjacent neighbourhood character and site context by enhancing building features and screening the UC/TPSS, associated utilities and parking areas from adjacent land uses.

2. The landscape design aesthetic and materials must correspond to the Character Zone in which it is located.

3. Landscaping should be distributed around the UC/TPSS, but must not be placed where openings, such as doors and louvres, would be blocked.

4. Plant materials for UC/TPSS landscaping must be complementary to plant materials within the applicable Character Zone.

5. The landscaping must accommodate UC/TPSS operations, Maintenance, and access in accordance with Appendix 5-1B [*Operations and Maintenance Parameters*] of this Schedule.

D. Specialty Area 2A: Twin Brooks UC Landscape

1. Design Intent

a. The Twin Brooks UC Landscape must be a naturalized landscape that replaces the existing naturalized planting removed for construction. Trees and shrubs in naturalized beds will frame the building and tie into the retained naturalized/native landscape. Planting palette to reflect the Blackmud Creek River Valley native plant palette.

2. Trees

a. The Design-Builder must provide, at a minimum, the following caliper trees at the Twin Brooks UC site:

i. 8 deciduous trees

ii. 11 coniferous trees

3. Beds and Turf

a. The Design-Builder must provide the following.

Table 2-9.6.7.2: Specialty Area 2A: Twin Brooks UC Landscape

Description	Total Square Metres (minimum)
Naturalized Shrub Bed	115
Naturalized No Mow Grass	815

4. Sod

    a. The remaining areas that are not planted with the above specified plant material must be planted with sod, as per D&CS Volume 5 Section 02920 Seed and Sod.

E. Speciality Area 2B: Anthony Henday TPSS Landscape

1. Design Intent

    a. The Anthony Henday TPSS Landscape must be a naturalized landscape of no-mow grasses within the TUC.

    b. Trees and shrubs must be planted within the existing MacEwan SWMF adjacent to the TUC to replace any naturalized tree removals required for the construction of the Anthony Henday TPSS. Planting within the SMWF must be naturalized planting beds, seamlessly integrated with the retained naturalized/native beds. This planting will act as a screen between the TPSS and the SWMF. Planting palette must reflect the naturalized/native plant palette found in the adjacent SWMF and tree stands. Planting within the SWMF must meet the requirements of D&CS Volume 5 Section 7.3 Naturalization with the following amendments:

        i. 35% of all plant material must be trees;

        ii. 50% of all trees must be a minimum of 65 mm caliper size (deciduous tree), and a minimum 2.5 m in height (coniferous tree). A variety of sizes of trees should be used to create a natural aesthetic; and

        iii. 25% of all shrubs must be five-gallon pot size minimum.

2. The Design-Builder must provide, at a minimum, the following caliper trees adjacent to the Anthony Henday TPSS site within the SWMF:

    a. 4 coniferous trees

3. Beds and Turf

    a. The Design-Builder must provide the following.

Table 2-9.6.7.2-1: Speciality Area 2B: Anthony Henday TPSS Landscape

Planting Bed Type	Total Square Metres (minimum)
Naturalized No Mow Grass Areas	260
Mulched Shrub Beds	To be determined by DB

F. Speciality 2C: Heritage Valley North UC Landscape

1. Design Intent

    a. The Heritage Valley North UC is located north of the Heritage Valley North Station on the west side of the LRT trackway. The naturalized landscape must reflect the planting palette found at the Heritage Valley North Station and within the Character Zone.

2. Trees

   a. The Design-Builder must provide, at a minimum, the following caliper trees at the Heritage Valley North UC site:

      i. 3 deciduous trees

      ii. 5 coniferous trees

3. Beds and Turf

   a. The Design-Builder must provide the following.

Table 2-9.6.7.2-2: Speciality Area 2C: Heritage Valley North UC Landscape

Planting Bed Type	Total Square Metres (minimum)
Mulched Shrub Bed	195
Naturalized No Mow Grass Areas	945

4. Sod

   a. The remaining areas not planted with the above specified plant material will be planted with sod, as per the D&CS Volume 5 Section 02920 Seed and Sod.

2-9.6.7.3 Speciality Area 3: SWMF Landscape Requirements

A. Location

1. The SWMF for the Heritage Valley North Station, the Park and Ride lot, and the Llew Lawrence Operations and Maintenance Facility (OMF) is located south of the OMF.

B. Design Intent

1. The SWMF will be characterized by naturalized wetland planting below normal water level and Naturalization beds of trees and shrubs located in areas of no mow grasses throughout the SWMF. Naturalization design and installation must meet the requirements of the D&CS and reflect the Wetland Character Zone requirements.

C. SWMF Specific Requirements

1. Trees:

   a. The Design-Builder must provide, at a minimum, the following caliper trees for the SWMF which must be located in shrub or mulch beds and planted in an informal layout.

      i. 105 deciduous trees

      ii. 77 coniferous trees

D. Beds and Turf

1. The Design-Builder must provide the following.

Table 2-9.6.7.2-3: Specialty Area 3: Stormwater Management Facility

Description	Total Square Metres (minimum)
Mulched Shrub Bed	6930
Dry Meadow Seed Mix Area	2750
Wet Meadow Seed Mix Area	1410
Live Soils Area	2925

2. Sod

    a. A 2 m wide mowing strip along the edges of SUP and Amenity Nodes must be sod.

    b. The remaining areas that are not planted with the above specified plant material must be planted with sod, as per D&CS Volume 5 Section 02920 Seed and Sod.

2-9.6.7.4 Specialty Area 4: Stations

A. Location

1. This Section 2-9.6.7.4 [*Specialty Area 4: Stations*] sets out landscape requirements for each Station, and includes the following locations:

    a. Twin Brooks Station

    b. Heritage Valley North Station

B. Design Intent

1. The Twin Brooks Station and Heritage Valley North Station are within designated Character Zones and contain PPZ. Both zones dictate the character of the landscape treatment. The station area landscape design should represent the pedestrian scale of the space. Planting patterns are to be smaller in scale and more detailed than other areas of the corridor.

2. The Heritage Valley North Station site must seamlessly integrate the landscape design aesthetic. Raised planters with integrated seating, and a similar planting palette as exists on the Transit Centre site must be provided. Naturalized planting should be laid out in an informal, natural layout within planters and at-grade beds.

C. Area Specific Requirements

1. Twin Brooks Station

    a. The Twin Brooks Station is located within Zone B: Urban Transition Character Zone. In addition to the overall design intent for the stations noted in Section 2-9.6.7.4, the landscape requirements for this station will be determined by the landscape requirements of Zone B – Urban Transition Zone.

    b. Pedestrian lighting must be provided where lighting levels on SUPs do not meet the requirements of Section 3-4.2 [*Reference Standards*], D&CS, and Section 3-4.4.1 [*Roadways, Sidewalks and SUP*]. Light pollution into adjacent properties must be minimized.

c. The Design-Builder must provide Shrubs and Perennials for the Twin Brooks Station located in mulched shrub and perennial planting beds and planted in a formal layout to distinguish it from the naturalized planting areas in this zone. These planting beds shall be placed within the boulevard to enhance the streetscape, and accesses to and from the platform. Areas for planting must be determined in the detailed design.

d. Beds and Turf

i. The Design-Builder must provide the following.

Table 2-9.6.7.4-1: Specialty Area: Twin Brooks Station

Description	Total Square Metres (minimum)
Mulched Shrub Beds (boulevard on east side of track)	288

2. Heritage Valley North Station

a. The landscape design for Heritage Valley North Station must include planting areas reflecting the Zone C: Nature Character Zone landscape requirements and the existing planting design at the Heritage Valley Transit Centre and Park and Ride.

b. The landscape design for the Heritage Valley North Station must include the area to the west of the station adjacent to the future TOD site. Design of the west area must consider future pedestrian connections to the future TOD site as well as future uses/development opportunities of the TOD site.

c. The Heritage Valley North Station site must be seamlessly integrated into the existing landscape design aesthetic of the Transit Centre. Raised planters with integrated seating, and a similar planting palette as exists on the Transit Centre site must be provided. Raised planters may be used to accommodate changes in grade of the plaza/concourse to achieve a 2% grade maximum for pedestrians. Planting should be laid out in an informal, natural layout within the planters, at-grade planting beds and within the area west of the station.

d. Pedestrian movements must be considered in the layout of the beds within this site. Seating nodes within the west area must be included and offer varying opportunities for sun, shade and wind protection.

e. Pedestrian lighting must be provided where lighting levels on SUPs and concourses/plazas do not meet the requirements of Section 3-4.2 [*Reference Standards*], D&CS, Section 3-4.4.1 [*Roadways, Sidewalks and SUP*].

f. The Design-Builder must provide, at a minimum, the following caliper trees at the Heritage Valley North Station site:

i. 24 deciduous trees

ii. 15 coniferous trees

g. Beds and Turf

i. The Design-Builder must provide the following.

Table 2-9.6.7.4-2: Specialty Area: Heritage Valley North Station

Description	Total Square Metres (minimum)
Mulched Shrub Beds	230
Mulched Shrub Beds in Raised Planters	125

h. Sod

i. The remaining areas that are not planted with the above specified plant material must be planted with sod, as per D&CS Volume 5 Section 02920 Seed and Sod.

SECTION 2-10 – CONSTRUCTION DOCUMENTS

2-10.1 GENERAL

A. All landscape design and construction must meet the requirements of the D&CS Volume 5 – Landscaping Design and Construction Standards, including but not limited to the following:

1. 02821 Chain Link Fence
2. 02870 Site Furnishings
3. 02910 Topsoil
4. 02914 Mulches
5. 02918 Colour Coding of T-Bar Tree Stakes
6. 02920 Seed and Sod
7. 02930 Trees, Shrubs and Ground Covers
8. 02931 Naturalization
9. 04420 Feature Boulders and Collected Stone

B. Exceptions and amendments are listed below and must be used in lieu of the clauses in the requirements listed above.

2-10.2 LOW IMPACT DEVELOPMENT FACILITIES

A. LID Facilities must be designed and constructed in accordance with the LID standards and guidelines and D&CS Volume 3 – Drainage; Volume 3-02 Stormwater Management and Design Manual – Addendum Volume 3-02: Stormwater Management and Design Manual.

B. In the event of any conflict, ambiguity or inconsistency between or among the requirements of these standards and guidelines, the more stringent requirements will apply.

C. Major outlets and inlets of LID Facilities must be landscaped with plant materials and boulders to provide visual screening.

2-10.3 STRUCTURAL SOIL CELLS

A. Structural Soil Cells if included, must:

1. Have been manufactured and on the market for a minimum of 10 years. Specified structural soil cell systems shall be one of the following, or approved an alternate:
    a. Silva Cell 2 by DeepRoot
    b. Stratavault 30 by Citygreen
    c. Stratavault 45 by Citygreen
2. Include a Manufacturer Warranty for Structural Soil Cell components for a minimum of 20 years.
3. Include soil inspection ports with direct access to the soil to permit access for “Guelph Permeameter” testing, and soil grab sampling.

4. Include aeration/irrigation vents and perforated air/water distribution piping where trees are not irrigated as part of a LID drainage system.

5. Be integrated into the overall Structural Soil Cell system design and be integrated with the streetscape design requirements for Structural Soil Cell maintenance structures, such as access locations and sediment catch basins.

6. Include inlets complete with sediment basins, for Structural Soil Cells used as Stormwater Management Facilities.

7. Include an under-drainage system and outlets for Structural Soil Cells used as Stormwater Management Facilities or for tree trenches.

8. Be designed for freeze and thaw cycles if used as Stormwater Management Facilities.

9. Mitigate buildup of road salts and walkway de-icing agents within planting soils if used as Stormwater Management Facilities.

B. Coordination and written agreements with Public Utility Companies must be obtained if Public Utility Infrastructure cross through or are located within Structural Soil Cells.

C. All Structural Soil Cells must be registered as buried Utilities with the City.

D. Structural Soil Cells are not permitted to extend below Roadways or concrete verges.

2-10.4 LANDSCAPE SUB-DRAINAGE SYSTEM

A. A sub-drainage system must be provided in all locations where trees in Structural Soil Cells are planted in Roadway Boulevard Landscaped Areas and Roadway Median Landscaped Areas, except that:

1. the sub-drainage system is not required in locations where five or fewer trees are planted in a single trench.

B. The sub-drainage system must be connected to, but is not part of, the City drainage Infrastructure and must discharge by gravity to a City catch basin or stormwater manhole, whichever is closer.

C. A Manufacturer's Warranty for a minimum of 20 years must be provided for sub-drainage systems.

2-10.5 ISOLATED LANDSCAPE DISTURBANCE

A. Areas of isolated landscape disturbance must be restored to conditions present at the time of the start of Construction, in accordance with the D&CS.

2-10.6 TOPSOIL, LID SOILS AND LIVE SOILS

A. All Topsoil properties and placement must conform to D&CS Volume 5 Section 2910 Topsoil with the following amendment:

1. The Design-Builder must spread topsoil uniformly on prepared and scarified subsoil to achieve a minimum compacted or settled depth of 300 mm for seeded areas and 200 mm for sodded areas.

B. All LID soils must conform to the City's Low Impact Development Best Management Practices Design Guide Edition 1.1, December 2014", available on the City's website and the D&CS.

C. Live soils from the temporary SWMF, north of the Heritage Valley Transit Centre and Park and Ride, must be salvaged and stored for reuse below normal water level in the construction of the ultimate SWMF. The Design-Builder must salvage and store live soils using industry best practices.

2-10.7 PLANTING BEDS

A. Planting beds must conform to D&CS Volume 5 Section 2930 -Trees, Shrubs and Groundcovers, and Details LA 108A Typical Tree and Shrub Planting Bed, and LA 108B Typical Shrub Planting with the following amendments:

1. Planting bed depth must be 500 mm, including naturalization beds.

B. Perennials must be included in shrub beds only as identified in Section 2-9.6 [*Character Zones and Specialty Areas]* and the Design Drawings.

C. Individual shrub planting beds must have a minimum contiguous area of 3.0 m2, and no individual dimension may measure below 1.5 m.

D. Individual shrub and perennial planting beds must have a minimum contiguous area of 3.0 m2 and no individual dimension may measure below 1.5 m.

E. Shrub and perennial plant material within Medians and Intersection Landscaped Areas must be a maximum height of 750 mm at maturity.

F. All planting beds adjacent to turf must have a well-defined edge in accordance with Drawings LA108 and LA109 of the D&CS Volume 5:

1. PVC edging is not permitted.

G. Shrubs and perennials should be spaced according to mature plant diameters in accordance with *Alberta Yards and Gardens: What to Grow* by Alberta Agriculture Food & Rural Development.

H. If plant species are not listed in *Alberta Yards and Gardens: What to Grow*, plants should be spaced according to the mature diameter listed in an alternate reputable horticultural information resource.

I. Minimum shrub size at installation must be #2 container. 60% of total shrubs per planting bed must be installed as a #5 container or larger. Minimum perennial size must be #1 container.

1. Naturalization bed plant material is not included in the above clause. Refer to the D&CS and Specification 02931 Naturalization.

2-10.8 WEED BARRIER FABRIC

A. The use of weed barrier fabric is prohibited.

2-10.9 ROOT BARRIER

A. Root barrier must be installed between planting beds and residential property lines where the edge of the planting bed is 3 m or less from the property line.

B. Root barrier must be installed between naturalized and/or no mow grass areas and residential property lines.

C. Root barriers must be:

1. a minimum 600 mm depth; and

2. securely installed to prevent movement from freezing ground.

D. A Manufacturer's Warranty for a minimum of 20 years must be provided for root barriers.

2-10.10 MULCHES

A. All mulch materials and installation must conform to D&CS Volume 5 Section 2914 Mulches, with the following amendments:

1. Tree, shrub and perennial planting bed areas must use deciduous wood chip mulch.

2. Llew Lawrence Operations and Maintenance Facility planting beds, where the plant material composition is at least 80% Coniferous, must use coniferous wood chip mulch.

3. All Naturalization Areas must use coniferous wood chip mulch.

4. Blackmud Creek River Valley Naturalization area must be mulched as per Schedule 10 [*Environmental Performance Requirements*].

2-10.11 PLANT MATERIAL

2-10.11.1 General Plant Selection Requirements

A. All plant material and Installation must conform to D&CS Volume 5 Section 2910 Trees, Shrubs and Groundcovers.

B. Plant material must be appropriate for the planting application, site conditions (including anticipated chloride levels), and local climatic and environmental conditions.

C. Plant material must provide year-round visual interest and the scale must reflect the proximity and time spent adjacent to the plantings by the various users.

D. Planting beds should be complementary to each other and provide a sense of visual continuity within each Character Zone, opportunity area, and Specialty Area.

E. Plant materials bearing edible foliage or fruit are not permitted in Known Contaminated Locations or Possible Contaminated Sites.

F. Plant materials bearing edible foliage or fruit must be placed in a mulched planting bed within safe and easily accessed sites.

2-10.11.2 Tree Selection Requirements

A. The diversity and spacing of trees must be derived from D&CS, Volume 5 Landscaping, Appendix F: Tree Diversity and Approved Species Spread and Spacing.

B. The quantity of trees from any single genus must not exceed 25% of the total amount of trees along the LRT Corridor.

C. The quantity of Fraxinus pennsylvanica species and cultivars must not exceed 5% of the total amount of trees along the LRT Corridor.

D. All Deciduous trees, not including columnar varieties or those planted in Naturalization Areas, must be free of branches from the base to a point not less than 60% of the tree height or a minimum height of 1.5 m above ground.

E. All Deciduous trees with canopies that overhang walkways, pedestrian areas, and Roadways must be free of branches from the ground to a minimum height of 2.5 m.

F. Black Spruce (Picea mariana) may only be planted in bioswales and Naturalization Areas that provide the correct moisture regime. This tree must not be planted in any other sites.

G. Where coniferous trees are used for screening purposes at Utility Complexes and the Llew Lawrence OMF, the minimum spacing may be reduced to:

   1. 3.0 m for Pinus species

   2. 6.0 m for Picea species

2-10.11.3 Shrub and Perennial Selection Requirements

A. The shrubs and perennials selected by the Design-Builder must have a minimum plant zone hardiness of Zone 3B (Canada Plant Hardiness Zone Map) and must meet the requirements of D&CS Volume 5 Section 02930 Trees, Shrubs and Ground Covers.

2-10.11.4 Naturalization Bed Plant Material Requirements

A. The selection of plant material for the Naturalization beds must meet the requirements of D&CS Volume 5 Landscaping Section 7.3 Naturalization, and the Construction Specification 02931 Naturalization.

B. All Naturalization beds must be comprised of plant materials from the Aspen Parkland Ecoregion, unless otherwise identified for specific beds.

2-10.11.5 Naturalization No Mow Grass Area Requirements

A. The selection of seed mixtures for no mow grass areas must meet the D&CS Volume 5 Landscaping Section 7.3 Naturalization and the Construction Specification 02931 Naturalization.

B. The specific seed mixture selection must be appropriate for the topography and microclimate of each site. Each aspect and water regime of the site should be addressed in the seed mixture selection. Custom mixes are permitted and must be included in the plant lists for approval by the City.

2-10.11.6 SWMF Plant Material

A. Plant material below the 1:5 year Flood Level of SWMF must be selected from the City of Edmonton Low Impact Development Best Management Design Guide and City of Edmonton Low Impact Development Construction, Inspection & Maintenance Guide.

B. The selection of plant material for the Naturalization beds must meet the requirements of D&CS Volume 5 Landscaping Section 7.3 Naturalization, and the Construction Specification 02931 Naturalization.

C. Using industry best practices, live soils must be salvaged from the temporary SWMF, stockpiled at an approved location, and reused in the permanent SWMF.

D. The SWMF must have Naturalization no mow grasses throughout, with the exception of a 2 m sod mowing strip on each side of the SUP.

2-10.11.7 Seed and Sod

A. All grass areas must be sodded, with the exception of No Mow Grass Areas, which must be seeded.

2-10.12 IRRIGATION

A. Permanent active irrigation systems are not permitted in LRT Corridor Landscaped Areas, except when existing active irrigation systems are impacted by Construction, in which case they must be reinstated.

B. Temporary active irrigation systems are permitted for landscape establishment but must be removed by the Landscape Final Completion Date.

2-10.13 BOULDERS

A. All Boulders must conform to D&CS Volume 5 Specification 04440 Featured Boulders and Collected Stone with the following amendment:

1. Boulders may only be located in shrub beds, rip rap, and other no mow areas.

2. When placed in a median or adjacent to a Roadway, boulders must have a minimum horizonal clearance to the adjacent Roadway that adheres to the requirements of the HFDG.

2-10.14 FENCING

A. In keeping with the urban-integrated design vision for the Project, the use and extent of fences should be minimized while fulfilling requirements for safety and security of the LRT Corridor and facilities.

B. The City will pre-install Visual Screen Fences along the LRT Corridor, as shown in Appendix 5-1A [*Project Description Drawings*] by no later than November 15, 2024.

C. The LRT Corridor, including at Stations, must be protected by hard barriers as described in the HFDG, as required by the defined operating speed and corridor type. Hard barriers must preclude both intentional and inadvertent access to the Trackway and include concrete barriers when adjacent to a roadway and pedestrian exclusion fencing when adjacent to sidewalks, SUPs or boulevard space.

D. Glass, polycarbonate or other transparent panels/sections will not be permitted as a component of fencing, handrails, and/or barriers at any location.

E. The following fences must be installed:

1. Protective Fencing

a. The retained tree stand on the south-east side of the proposed 127 Street alignment must have a standard protective fence.

b. The protective fence must be placed 5 m from the edge of the retained tree stand as described in *Llew Lawrence Operations and Maintenance Facility Tree Removals and Preservation Plan* in the Disclosed Data.

2. Safety Fencing

a. Safety fencing will function as a safety barrier for all users.

b. Safety fencing must be located on or alongside, Retaining Walls within the LRT Corridor that are adjacent to SUPs and Walks, and as Track Barriers at the edge of the Trackway along Roads, Walks/SUPs and Stations.

c. Safety fencing should be Omega Fence Systems Elite Double Wire, or approved equal. Fencing must have square caps on posts. Colour: Black.

d. Safety fencing at Stations may be a different colour to complement and reflect the Station architecture.

e. Safety Fencing must be a minimum of 1230 mm in height, unless otherwise stipulated by codes and regulations, and be secured to: the top of, or adjacent to, the back of the retaining walls; top of safety fence curb; or offset from the back of sidewalks/SUP to provide adequate shy space, as per Manufacturer's specifications.

f. Safety fencing must meet HFDG requirements and all codes and regulations.

3. Security Fencing and Gates

a. Security fencing and gates must:

i. meet the D&CS Volume 5 Specification 2821 Chain Link Fence for supply and installation with the following amendments:

i.) be industrial grade chain link fence with appropriate fasteners and fittings; and

ii.) be 2400 mm in height with a three-strand barbed wire top.

b. Security gates must be single slide cantilever, located at the following locations:

i. southwest access to Llew Lawrence OMF site at the SWMF.

ii. on 127 Street NW at the north limit of the SWMF.

c. Security gates will require CCTV coverage and voice communication with the OCC for visitors.

d. Security gates must have an access control system for employees, complete with electric locks, card readers and an access control panel.

e. Security fencing and gates must be galvanized steel pipe with heavy polyester powder coat paint finish. Colour: Black.

2-10.15 RETAINING WALLS

A. Retaining walls may be required to incorporate existing property line grades into the Design of sidewalks, SUPs, or the LRT Trackway where slope grading is not practicable.

B. Retaining walls must be located and Designed to be integrated with the overall landscape and SUI design.

C. Retaining walls must be Designed and Constructed with consideration for geotechnical and structural conditions as required.

D. Acceptable materials for retaining walls are cast-in-place or precast concrete, and concrete block.

E. Timber walls are not permitted.

SECTION 2-11 – LANDSCAPE MAINTENANCE AND ESTABLISHMENT

A. Without limiting the Design-Builder's obligation to ensure that all Project Work described in Section 2-9 [*Landscape Architecture*] and within the Design Drawings is completed by a date not later than the Construction Completion Date, the Design-Builder must maintain, water, repair, weed, reseed, replant, reinstall, and conduct other work in accordance with the requirements of Section 2-9 [*Landscape Architecture*], the D&CS, best practices, and the landscape maintenance plans, and as otherwise required, to ensure that at the Landscape Final Completion Date, for all Landscaped Areas:

1. 100% of all plant materials are in place and in good horticultural condition, with the exception of Naturalization which must follow the requirements in D&CS Volume 5 Landscaping Section 7.3 Naturalization, and the Construction Specification 02931 Naturalization.

2. 100% of all site furnishings are in place and in pristine condition.

3. All installations and measures are in place and meet the requirements of the D&CS.

4. All areas meet the landscape maintenance outcomes specified in this Section 2-11 [*Landscape Maintenance and Establishment*] and in the D&CS.

(collectively, the "Landscape Final Completion Requirements").

B. The Design-Builder must submit to the City, as part of the Final Design submission for each of the Landscaping Work Packages, a landscape maintenance plan that includes a schedule for the maintenance period from installation through Landscape Final Completion. This plan must include detailed descriptions of maintenance strategies, practices and methods required for all Landscaped Areas, including but not limited to:

1. weed control

2. integrated pest management

3. turf management, including reseeding

4. fertilizers, top dressings, and soil amendments

5. mulches

6. watering

7. pruning

8. mitigation measures for Landscaped Areas affected by roadway salts/gravel

9. snow removal ice control areas (walks, SUP, platforms, etc.) and snow stockpile areas

10. landscape protection measures to prevent third party damage

C. Immediately after landscape installation, the Design-Builder must maintain trees, shrubs, and plants planted by the Design-Builder and their respective plant beds to the standards set out in the Landscape Maintenance Plan for the maintenance period from installation through to the Landscape Final Completion.

D. Landscape maintenance practices must focus on horticultural practices that produce vigorous and healthy plant material.

E. Landscape maintenance must provide the following outcomes:

1. Landscaped Areas free of debris and refuse;

2. high quality weed free landscapes;

3. healthy and vigorous plant material; and

4. landscape materials and elements free from damage or deterioration.

F. Landscape maintenance must employ only ecologically sound practices for plant health care, including, but not limited to:

1. integrated pest management;

2. composting;

3. application of organic mulches;

4. use of organic fertilizers; and

5. use of organic or environmentally-friendly weed control products and methods.

G. Maintenance of existing trees that are not affected by construction activities will remain the responsibility of the City.

H. The Design-Builder must submit to the City in November of each year of the Agreement, all landscape maintenance logs documenting maintenance undertaken for each landscape package.

SECTION 2-12 – TREE RETENTION, REMOVAL AND PROTECTION/PRESERVATION

A. This Section sets out the TRRP requirements for the Project.

B. The Design-Builder must obtain a permit pursuant to City of Edmonton Bylaw 18825 Public Tree Bylaw prior to commencement of any tree removal or protection work within the Lands.

C. The Design-Builder, from the Effective Date, must provide the tree protection of native/naturalized tree stands that were modified during antecedent work by others, including but not limited to:

1. Llew Lawrence OMF Site

    a. The Design-Builder must provide protection of the retained tree stand modified by antecedent work by others and include activities as described in the *Llew Lawrence Operations and Maintenance Facility Tree Removals and Preservation Plan* as Disclosed Data.

    b. The Design-Builder must provide standard protection fencing along the retained tree stand with Wildlife Breaks to facilitate the movement of large ungulates. Educational signage regarding these breaks must be provided on the standard protection fencing.

2. Blackmud Creek River Valley

    a. The Design-Builder must provide protection of the retained tree stands modified by antecedent work by others and include activities as described in the *111 Street EPCOR Construction Tree Removals and Preservation Plan* in the Disclosed Data.

D. The Design-Builder, from the Effective Date, must provide tree protection for those trees planted on boulevards or within public open spaces (i.e.: not part of a natural stand) that are to be retained and require protection from construction. The Design-Builder is to follow the requirements of this section for protecting these trees during construction. Protected trees are to be identified as such in the TRRP for the project.

E. The Design-Builder must maintain a Tree Management Log throughout the Project and submit to the City on an annual basis. The Tree Management Log shall document all activities regarding tree retention, removal and protection/preservation including, but not limited to; related tree protection, root management, and branch management measures and procedures for trees damaged during Construction as identified in this Section 2-12 [*Tree Retention, Removal and Protection/Preservation*].

F. Within 180 days of the Effective Date, the Design-Builder must submit to the City a plan (the “TRRP Plan”) that:

1. incorporates the Tree Valuation Inventory tables included in the Bid Extracts and includes the following information for all existing trees within the Lands:

    a. Table 1

        i. tree Identification Number

        ii. tree species

        iii. Dbh - caliper diameter at breast height

        iv. assessment value

        v. Design-Builder’s selections for removal

    b. Table 2

i. Forested Area

ii. assessment value unit rate

iii. existing area of each Forested Area

iv. Design-Builder's selections for areas of removal

c. Identifies the physical locations of all existing trees and Forested Areas using the Tree Inventory drawings included in the Bid Extracts, which:

i. identify whether each tree or Forested Area or portion thereof will be retained and protected, or removed;

ii. match the Tree Valuation Inventory tables described in Section 2-12C [*Tree Retention, Removal, and Protection/Preservation*];

iii. identifies the mitigation strategies employed to ensure the health and longevity of all Protected and Preservation Trees; and

iv. complies with the D&CS, latest edition.

G. The assessment value of trees and Forested Areas identified for removal in the TRRP Plan submitted within 180 days of the Effective Date must sum to the Target Tree Compensation Value.

H. Within 180 days of the Effective Date, the Design-Builder must survey all trees within the Lands and show the surveyed locations on the updated TRRP for the applicable Work Package.

I. If the survey identifies additional trees within the Lands that were not previously identified on the Tree Valuation Inventory tables, the City may, at its discretion, choose to relocate the trees within 60 working days, during the transplant window of May 1 to October 31.

J. Tree Status Changes

1. Protected Tree to Removal Tree

a. The Design-Builder must submit an updated TRRP Plan for the applicable Work Package that identifies all revisions to the selection of Removal Trees as identified in the Tree Valuation Inventory tables and a reference to the applicable Final Design.

2. Removal Tree to Protected Tree

a. The Design-Builder must submit documentation from the Arborist confirming that no more than 30% of the tree has been damaged.

b. If no more than 30% of the tree has been damaged, the City will approve, or not approve, the recommended tree status change.

c. Removal Trees must be protected in the same manner as Protected Trees until the City has confirmed the tree status change.

K. Prior to the start of Construction of any applicable Work Package:

1. the Design-Builder must submit to the City a letter confirming the current TRRP Plan is accurate for the applicable Work Package; or

2. the Design-Builder must submit to the City an updated TRRP Plan for the applicable Work Package, which identifies all revisions to the selections of Protected Tree, or Removal Tree in the Tree Valuation Inventory tables and a reference to the applicable Final Design; and

3. the Tree Removal Adjustment will be calculated in accordance with Section 2.5 *[Tree Removal Adjustment]* of Schedule 16 *[Payment Mechanism]*, based on the Final Tree Reconciliation Report.

L. The Design-Builder must submit to the City a monthly tree reconciliation report, which includes:

1. a list of tree removals completed since the last monthly reconciliation and a cumulative total value of tree removals based on the value of trees established in the Tree Valuation Inventory since Commercial Close.

M. The Design-Builder must submit to the City an annual tree reconciliation report, on the anniversary of the Effective Date, which includes:

1. compiled modifications to the TRRP Plan for the year since the Effective Date anniversary;

2. a list of tree removals completed since the last Effective Date anniversary and a cumulative total value of tree removals based on the value of trees established in the Tree Valuation Inventory since the Effective Date;

3. all Tree Management Logs since the last Effective Date anniversary; and

4. all Tree Risk Assessments since the last Effective Date anniversary.

N. The Design-Builder must submit to the City no later than 20 Business Days before the Construction Completion Date a final tree reconciliation report (the "Final Tree Reconciliation Report"), which must include:

1. all modifications to the TRRP Plan since the Effective Date;

2. a record of tree removals completed during the Construction of the Project; and

3. a record of the aggregate value of tree removals based on the value of trees established in the Tree Valuation Inventory since the Effective Date.

2-12.1.1 Tree Retention

A. If there is a change to the Lands boundary, and a tree formerly outside of the Lands is now inside of the Lands, the tree will be deemed a Protected Tree.

2-12.1.2 Tree and Vegetation Removal Procedures

A. The Design-Builder must conform to the following tree and vegetation removal procedure requirements, except in Blackmud Creek River Valley, a Sensitive Area, where additional measures may be required as described in Schedule 10 [*Environmental Performance Requirements*]:

1. all removals must be carried out by an Arborist;

2. all tree stumps must be removed, grubbed, or ground down a minimum of 300 mm below-grade.

2-12.1.3 Forested Area Vegetative Buffer

A. Tree and vegetation removals may include existing Forested Areas. To protect the health of the existing stand remaining after removals, the Design-Builder must install a vegetative buffer of

Naturalization planting between the remaining Forested Area and cleared areas to meet the following requirements:

1. The vegetative buffer should consist of some retained existing vegetation and added Naturalization planting to be developed within the Forested Area, adjacent to the cleared edge. It must extend a minimum of 3.0 m from the cleared edge into the Forested Area. Some of the existing native stand should remain, with larger material within 1.5 m of the retained native stand, and smaller material within 1.5 m of the cleared edge.

2. Topsoil installation may be required to provide suitable site conditions for added grasses, whips and plugs.

3. In areas designated as vegetative buffer, thin existing vegetation within 1.5 m of the Forested Area edge to remain to 30% of existing coverage. Existing vegetation to remain should consist of healthy, larger trees and shrubs.

4. In areas designated as vegetative buffer, thin existing vegetation within 1.5 m of cleared edge to 10% of existing coverage. Existing vegetation to remain should consist of smaller, healthy trees and shrubs.

5. Thin all unhealthy trees, damaged trees and shrubs.

6. Existing deciduous trees greater than 25 mm caliper must be removed by an arborist.

7. Existing spruce trees taller than 1.5 m must be removed by an arborist.

8. Only grub out stumps if they prevent meeting the required amount of new planting.

9. Within 1.5 m of native stand edge to remain: Installation of whips and plugs at a rate of one plug/whip per m2, within remaining retained vegetation. Plugs/whips to be mulched with a minimum diameter of 300 mm at 50 mm deep.

10. Within 1.5 m of cleared edge: Installation of whips and plugs at a rate of two plugs/whips per m2 complete with Naturalization seed, within remaining retained vegetation. Plugs/whips to be mulched with a minimum diameter of 300 mm at 50 mm deep.

11. Species selection of proposed material should emulate existing Forested Area.

12. Provide tree protection fencing along the vegetative buffer.

2-12.1.4 Tree Protection in Critical Root Zones

A. The Critical Root Zones of all Protected Trees and Removal Trees (before declaration as a Removal Tree) must be protected from compaction and damage to tree trunks, canopy and root systems. Figure 2-12.1.4 [*Critical Root Zones*] illustrates the Critical Root Zones A, B and C, which will be determined as follows:

   1. Critical Root Zone A is calculated as half the diameter of the existing tree canopy (dripline);

   2. Critical Root Zone B is calculated as equal to the diameter of the existing tree canopy (dripline);

   3. Critical Root Zone C is calculated as twice the diameter of the existing tree canopy (dripline).

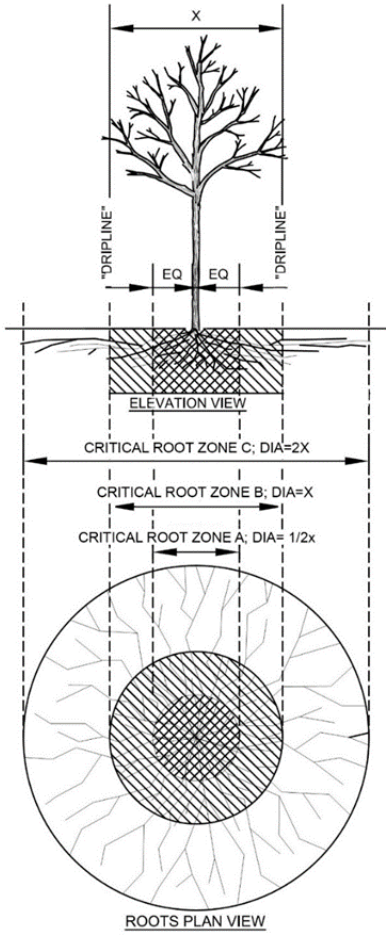


Figure 2-12.1.4: Critical Root Zones

B. Critical Root Zones A and B must be protected with an 1800 mm high temporary metal construction fence, installed and pinned in place along the outer perimeter of Critical Root Zone B prior to any construction within 20 m of the tree, except where Critical Zone B:

   1. Overlaps an active lane of traffic, in which case the perimeter fence must be installed within 500 mm of the back of curb.

   2. Overlaps an active walkway or SUP, in which case the perimeter fence must be installed 300 mm from the edge of a sidewalk or 600 mm from the edge of an SUP.

   3. Overlaps a primary access to a residential property, in which case the perimeter fence must be installed such that a minimum 1500 mm access path is maintained to each residential property.

C. A sign with yellow background and minimum size of 300 mm x 500 mm must be mounted on each tree protection fence. The signs must include:

   1. A diagram illustrating the tree protection zone in accordance with Figure 2-12.1.4 [*Critical Root Zones*].

2. Contact information, including phone number, for the Arborist who is responsible for modifications to tree protection fence and tree damage evaluation.

3. Tree Identification Number and assessment value for each tree within the temporary construction fence.

4. The following text: “This fence protects the trees within its perimeter. This fence will not be removed or adjusted”.

D. The following activities are not permitted in Critical Root Zone A:

1. stockpiling of materials, refuse or debris

2. storage of chemicals

3. use as a staging area or for storage of equipment

4. use as parking, haul road or construction access area

5. trenching

6. raising or lowering existing grade, or

7. root pruning

E. The following activities are not permitted in Critical Root Zone B:

1. stockpiling of refuse, debris or materials

2. storage of chemicals

3. use as a staging area or for storage of equipment

4. use as parking, haul road or construction access area, except when:

   a. using an existing concrete or asphalt surface that is designed to support required loading; or

   b. using steel plates or timbers to support required loading and prevent soil compaction

5. trenching or excavation, except:

   a. when less than 1/3 of Critical Root Zone B will be disturbed

6. raising or lowering existing grade, except when:

   a. grade is raised or lowered less than 100 mm from existing grade; or

   b. less than 1/3 of Critical Root Zone C is raised or lowered more than 100 mm from existing grade; or

   c. root pruning

F. The following activities are not permitted in Critical Root Zone C:

1. stockpiling of refuse, debris or materials that may be harmful to the health of the tree

2. stockpiling of any material for more than 4 weeks

3. storage of chemicals

4. use as a staging area or for storage of equipment

5. use as parking, haul road or construction access area, except when:

    a. using an existing concrete or asphalt surface that is designed to support the required loading; or

    b. using steel plates, timbers or minimum 200 mm depth shredded wood mulch to support required loading and prevent soil compaction.

6. trenching or excavation, except:

    a. when less than 2/3 of Critical Root Zone C will be disturbed.

7. raising or lowering existing grade, except when:

    a. grade is raised or lowered less than 100 mm from existing grade; or

    b. less than 2/3 of Critical Root Zone C is raised or lowered more than 100 mm from existing grade.

G. Work within Critical Root Zone A must be conducted in the following manner:

1. At a minimum, while work is occurring within Critical Root Zone A, a layer of 200 mm depth shredded wood mulch on geotextile fabric must be installed over Critical Root Zone A.

2. Equipment and activities within Critical Root Zone A must not compact soil or have a tire or track pressure exceeding 42 kPa, with maximum axle loads below 5.5 tonnes. Driving on soils that are wetter than their plastic limit, as defined in ASTM Standard D 4318, is not permitted.

H. Work within Critical Root Zone B must be conducted in the following manner:

1. Equipment and activities within Critical Root Zone B must not compact soil or have a tire or track pressure exceeding 42 kPa, with maximum axle loads below 5.5 tonnes. Driving on soils that are wetter than their plastic limit, as defined in ASTM Standard D 4318, is not permitted.

I. Record the date, description and details of all tree protection procedures and measures in Critical Root Zones in the Tree Management Log.

2-12.1.5 Root Management Procedures

A. Prior to construction within a Work Package, identify tree roots within Critical Root Zone C that will require root pruning to accommodate construction activities such as excavation and trenching.

1. Provide the City with a five-month window to root prune trees identified by the Design-Builder.

B. If roots of Protected Trees or Removal Trees (before declaration as a Removal Tree), are encountered in Critical Root Zone C during Construction, the following will apply:

1. Any roots between 10 mm and 50 mm in diameter damaged during Construction must be exposed to sound tissue and cleanly cut with a saw or pruning shears.

2. Any roots over 50 mm in diameter damaged or encountered during Construction must be dealt with according to the following procedure:

a. the Arborist will evaluate the root to determine the resulting level of damage to the overall tree if the root is cut;

b. the Arborist will review the Tree Management Log to confirm that severing the root will not cause cumulative tree damage equal to or greater than 30%;

c. the Arborist will determine whether these roots need to be cut or avoided;

d. of the root is to be cut, the Design-Builder must notify the City at least 48 hours prior to providing a 5 Business Day window for the City to prune the root;

e. the Arborist must record the following information in the Tree Management Log:

i. the date when the root was encountered;

ii. the construction procedures and/or circumstances leading to the root being encountered;

iii. the level of anticipated tree damage, shown as percentage of entire tree including tree trunk, canopy and root system, if the root is cut; and

iv. the decision made regarding cutting or avoiding the root.

C. If roots of Protected Trees are encountered in Critical Root Zone C during Construction, the following will apply:

1. any roots between 10 mm and 50 mm in diameter damaged during Construction must be exposed to sound tissue and cleanly cut with a saw or pruning shears;

2. if any roots greater than 50 mm in diameter are encountered, the Design-Builder must notify the City at least 48 hours prior to providing a 5 Business Day window for the City to evaluate the root;

3. at the discretion of the City, the City may prune the root or require the Design-Builder to avoid the root during Construction.

D. Tree roots exposed in Critical Root Zones A, B, and C during Construction must:

1. be covered in layers of wet burlap;

2. be monitored daily by the Arborist with respect to tree health and burlap moisture level; and

3. be maintained by soaking the burlap at a minimum every 3 days.

E. The Design-Builder must record the date, description and details of all root pruning procedures in the Tree Management Log.

2-12.1.6 Branch Management Procedures

A. Prior to Construction within a Work Package, the Design-Builder must identify tree branches that will require pruning to accommodate construction access and other construction activities, and provide the City with a five-month window to prune trees identified by the Design-Builder.

B. During Construction, if additional branches of Protected Trees or Removal Trees (before declaration as a Removal Tree), require pruning to accommodate access or other construction activities, the Design-Builder must notify the City 48 hours prior to providing a five Business Day window for the City to complete pruning activities.

C. The Design-Builder will be responsible for ensuring that the pruning windows in this Section 2-12.1.6 [*Branch Management Procedures*] comply with the following seasonal requirements:

1. elms may only be pruned between October 1 and March 31;

2. deciduous trees, not including maples and birches, may only be pruned between October 1 and May 1;

3. coniferous trees, maples, and birches may only be pruned between June 1 and July 31; and

4. shrub pruning and minor tree branch pruning, except for elms, may be conducted in any season.

D. The Design-Builder must record the date, description, and details of all pruning procedures in the Tree Management Log.

2-12.1.7 Procedures for Trees Damaged During Construction

A. This Section applies after the start of work in the applicable work area.

B. Damage to trees is defined as any injury or physical damage occurring to the trunk, canopy or root system of a Protected Tree, Removal Tree or a tree located outside of the Lands. This includes damage from:

1. construction activities;

2. root or branch pruning, as identified by the Design-Builder, to accommodate construction or access, regardless of who conducted the pruning.

C. Damage to any part of a Protected Tree, Removal Tree or a tree located outside of the Lands, including roots, trunk and canopy, must be evaluated by the Arborist within 24 hours of damage occurrence. Depending on the level of damage to the tree, the following procedures must be followed:

1. the Arborist will conduct a Tree Risk Assessment and include a detailed Tree Risk Assessment report in the Tree Management Log. The Tree Risk Assessment report must include photo documentation with, at a minimum:

   a. an image of the entire tree

   b. images of the damaged areas of the tree, including a ruler or tape measure to indicate scale.

2. all tree work must be carried out in compliance with ANSI Z133 – for Arboricultural Operations – Safety Requirements;

3. the Design-Builder must submit detailed written recommendations to rectify tree damage based on the Tree Risk Assessment;

4. if damage to a Protected Tree is less than 30% of the entire tree, including tree trunk, canopy and root system the following procedures will apply:

   a. the Arborist will determine, based on records in the Tree Management Log, whether cumulative damage to the tree during Construction has resulted in total damage equal or greater than 30% of the entire tree, including tree trunk, canopy and root system and:

      i. if cumulative damage is equal or greater than 30%, procedures listed in Section 2-12.1.7 *[Procedures for Trees Damaged During Construction]* will apply;

      ii. the Arborist will evaluate and record the following information in the Tree Management Log:

i.) species;

ii.) date of damage occurrence;

iii.) construction procedures and/or circumstances causing the damage;

iv.) level of damage, shown as percentage of entire tree, including tree trunk, canopy and root system;

v.) methods used to rectify damage and any additional measures required to protect the tree from further damage; and

vi.) the Arborist will determine and perform tree damage correction measures within six Business Days of the damage occurrence.

iii. if damage to a Protected Tree is equal to or greater than 30% of the entire tree, including tree trunk, canopy and root system the following procedures will apply:

i.) the Design-Builder must notify the City of the damage incident within 48 hours of damage occurrence

ii.) the Arborist will evaluate and record the following information in the Tree Management Log:

a. species;

b. date of damage occurrence;

c. construction procedures and/or circumstances causing the damage; and

d. level of damage, shown as percentage of entire tree, including tree trunk, canopy and root system.

iii.) the Design-Builder must provide the City with uninterrupted access to the tree for a four Business Day window commencing immediately after notifying the City of the damage occurrence. During this window, the City will perform tree damage correction measures and post Construction care. If the City determines that the damage to a Protected Tree requires its removal, then that tree will be deemed removed in the calculation of the Actual Tree Compensation Value.

5. The Design-Builder will be responsible for the costs incurred by the City for any work undertaken on trees damaged during construction, including but not limited to; inspections, reviews of documentation provided by the arborist, any remedial work undertaken by the City, Valuation updates, and long-term maintenance scheduled by the City to assist with tree recovery.

6. The updated value of the damaged tree will be compared to the original City Valuation and the difference will be paid by the Design-Builder. If damages are such that the tree is no longer considered viable, the removal costs and the value of the tree will be paid by the Design-Builder.