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

Schedule 5 – D&C Performance Requirements

Part 5: Facilities

[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]

TABLE OF CONTENTS

TABLES AND FIGURES

PART 5: FACILITIES

SECTION 5-1 – DESCRIPTION OF INFRASTRUCTURE

5-1.1 GENERAL REQUIREMENTS

A. Part 5 [*Facilities*] sets out the Project Requirements for the Design and Construction of all buildings and all associated buildings systems including materials, components, assemblies, sub-assemblies and equipment unless otherwise specified.

1. Reference Designs have been prepared for each Station, Traction Power Substation and Utility Complex facility and the Reference Design data for each facility may be found in the Disclosed Data.

2. The facility names, types or function, and the locations and sites for each facility described in Part 5 [*Facilities*] of this Schedule are as follows:

   a. **Twin Brooks Station**: a center-loading, local Station located just north of the intersection of 111 Street and 9 Avenue NW.

   b. **Heritage Valley North Station**: an At-Grade center-loading, multi-modal, terminus/transfer, Station located adjacent to and west of the existing Heritage Valley Transit Centre, near the intersection of 135 Street and Ellerslie Road SW.

   c. **Twin Brooks Utility Complex**: located north of the NE corner of the intersection of 111 Street and 12 Street NW.

   d. **Anthony Henday Traction Power Substation**: located at the northmost extent of the MacEwan neighbourhood; south of Anthony Henday Drive and roughly midway between 111 Street SW and 127 Street SW.

   e. **Llew Lawrence OMF Utility Complex:** located near the northeast corner of the Llew Lawrence OMF building, south of Anthony Henday Drive, north of the existing park and ride, and between 135 Street SW and 127 Street SW.

   f. **Heritage Valley North Utility Complex**: located immediately north and west of Heritage Valley North Station.

5-1.2 REFERENCE SECTIONS

A. The Design and Construction of buildings must comply with the following:

1. **Architectural:** according to Part 5 [*Facilities*] of this Schedule.

2. **Building Structural:** according to Part 4 [*Transportation Structures and Building Structures*] and Part 5 [*Facilities*] of this Schedule.

3. **Building Mechanical and Building Electrical**: according to Part 5 [*Facilities*] of this Schedule.

4. **Systems:** according to Part 6 [*Systems*] of this Schedule.

5. **Site Grading and Servicing:** according to Part 3 [*Civil*] of this Schedule.

6. **Sustainable Urban Integration:** according to Part 2 [*Sustainable Urban Integration and Landscape Architecture*] and Part 5 [*Facilities*] of this Schedule.

SECTION 5-2 – REFERENCE DOCUMENTS

5-2.1 APPLICABLE CODES, REFERENCE STANDARDS AND GUIDELINES

A. Without limiting Section 1-2 [*Reference Documents*] of this Schedule and except as otherwise specified in this Part 5 [*Facilities*], the Design and Construction of Building Structures and associated equipment, components, materials, systems, and sub-systems must comply with the most current versions of the following codes, policies, and reference standards:

1. National Building Code of Canada – Alberta Edition
2. National Energy Code of Canada for Buildings
3. Canadian Electrical Code
4. National Plumbing Code of Canada
5. National Fire Code of Canada – 2019 Alberta Edition
6. CSA B72, Installation Code for Lightning Protection Systems
7. NFPA 130 Standard for Fixed Guideway Transit and Passenger Rail Systems
8. City of Edmonton High Floor LRT Design Guidelines
9. Edmonton Facility Consultant Manual, Volume 1 Design Process Guidelines, 2022-11-21 and Volume 2 Technical Guidelines, 2021-09-10, available on the City's website
10. City of Edmonton Facility Commissioning Consultant Manual, Volume 1 Whole Building Commissioning Process and Guidelines, 2018-11-30 and Volume 2 Building Envelope Commissioning Process and Guidelines, 2019-03-22, available on the City's website
11. City of Edmonton Road & Walkway Lighting Construction & Material Standards Volume 6
12. City of Edmonton Road & Walkway Lighting Design Standards Volume 6
13. City's *Climate Resilience Policy* (C627)
14. City's *Accessibility for Persons with Disabilities Policy* (C602)
15. City of Edmonton Access Design Guide (available on the City's website)
16. City's *Light Efficient Community Policy City Procedure* (C576)
17. CSA B651-18 Accessible Design for The Built Environment
18. CSA S478, Guideline on Durability in Buildings
19. Standard for Installation of fire Alarm Systems CAN/ULC-S524
20. Standard for Verification of fire Alarm Systems CAN/ULC-S537
21. Illuminating Engineering Society of North America (IES)
22. ETS Graphic Standards Manual: LRT Signage, Light Rail Transit (Graphic Standards Manual), March 25, 2021, available as Disclosed Data
23. Transport Canada Grade Crossing Standards, Part C

24. City's *Transit Oriented Development Policy* (C565)

25. City's *Winter Design Policy* (C588)

26. City of Edmonton, The Bike Plan, September 2020 (available on the City's website)

27. City of Edmonton Design and Construction Standards

28. City of Edmonton Road and Walkway Lighting Design Standards

29. City's *Community Standards Bylaw,* 14600

30. City's *Zoning Bylaw,* 12800

5-2.1.2 Sustainable Buildings Policy, Codes, and Ratings Systems

5-2.1.2.1 City of Edmonton C627 Climate Resiliency Policy and NECB Requirements

A. The procedure for "Climate Resilient Design and Construction of City Buildings" (June 10, 2021) is not mandatory for LRT Stations, Utility Complexes, and Traction Power Substations, however:

1. in alignment with Part 3.11 of the procedure for "Climate Resilient Design and Construction of City Buildings", the Design-Builder must demonstrate, within its Quality Management Plan as described in Schedule 9 [*Quality Management*]*,* how it will meet the intent of the procedure by specifically describing the sustainable goals that will be achieved through the Design and Construction of the Project;

2. notwithstanding the ability of the Design-Builder to Design and Construct the UC and TPSS facilities in accordance with the requirements of the NECB, prior to the submission of building permit applications for each UC and TPSS facility to the Authority Having Jurisdiction, the Design-Builder must submit an energy model of each facility to the City that:

    a. conforms to the requirements of Section 3.1.4 of the Edmonton Facility Consultant Manual;

    b. supports the sustainability objectives as set out by the Design-Builder in its Quality Management Plan; and

    c. validates the energy performance of each building's envelope, electrical and mechanical systems design per the requirements of the NECB.

SECTION 5-3 – DESIGN GUIDANCE / REQUIREMENTS

5-3.1 SUSTAINABLE URBAN INTEGRATION: GENERAL

A. Part 2 [*Sustainable Urban Integration and Landscape Architecture*] of this Schedule provides the overarching requirements for SUI and the specifications for landscape architecture.

B. SUI goals and objectives outlined in Section 2-1.3 [*SUI Goals and Objectives]* of this Schedule must be met.

C. Additional SUI requirements that are specific to individual facilities have been incorporated into this Section.

D. Stations, pedestrian rail crossings, UCs, TPSS, signals bungalows, and all other elements within the urban realm, Trackway, and associated infrastructure developed as part of the Project must be Designed and Constructed to:

1. create fully coordinated ensembles of buildings, movement systems, landscaped spaces, equipment enclosures and other supporting infrastructure elements that:

    a. integrate with their urban context

    b. together, convey a visually cohesive and consistent Design approach and system identity throughout the Project

2. be welcoming, safe, and comfortable spaces

3. provide seamless, pedestrian-first connections between and among the new and existing land uses, facilities and spaces that define and support the infrastructure

5-3.1.1 Station, Utility Complex, and Traction Power Substation Site Contexts and SUI Project Requirements

5-3.1.1.1 General

A. The Station, Utility Complex, and Traction Power Substation site contexts and SUI Project requirements are presented and organized in the following sections so that facilities and their respective site context descriptions commence at the northmost facility and proceed in the order that they are situated along the Project alignment in a north-to-south direction.

5-3.1.1.2 Twin Brooks Utility Complex

A. The Twin Brooks UC should be Designed and Constructed according to the character-defining architectural elements described in Section 5-3.1.2 and be in alignment with CPTED principles as per Section 2-4 [*Crime Prevention Through Environmental Design (CPTED)*] of this Schedule.

B. The Twin Brooks UC is based on a site within:

1. an existing Roadway right-of-way, immediately east of 111 Street NW running east of and parallel to the LRT ROW:

    a. north of the intersection of 111 Street NW and 12 Avenue NW

    b. approximately 350 m north of the Twin Brooks Station

C. The following are additional key site context factors:

1. a narrow Roadway right-of-way:

a. close to an intersection and immediately west of the required public Utility setback from the next adjacent property line east of the right-of-way;

b. formed as a sloped embankment extending, N-S, through the length of the site; and

c. separating the Roadway from the mainly residential land uses east of the sloped site.

2. views to the UC, from west-facing residential interiors, and rear yards located immediately east of the UC or from similar vantage points located directly west, northwest, and southwest across 111 Street NW and the LRT ROW;

3. mainly unimpeded views to the west elevation of the UC from northbound and southbound lanes of 111 Street NW;

4. potential for direct (unauthorized) access to the rooftop of the facility from the east side of the UC; and

5. potential for concealment from direct views (natural surveillance) of the east side of the facility.

D. The Design and Construction of the Twin Brooks UC and its principal site access point, driveway, parking, walkways, retaining structures and directly abutting sloped site should:

1. situate the building within the toe of the sloped embankment to visually integrate and fully accommodate the building and adjacent supporting site program;

2. provide sufficient vehicle manoeuvring space and turning movements within the UC parking area;

3. address the potential need for further landscaped slope stabilisation, retaining walls, and effective drainage away from the rear (east) of the building and north and south ends of the building, along with their associated architectural, urban design and CPTED impacts;

4. integrate site lighting and access control features that:

a. mitigate unauthorized access to the rooftop from the east side of the building;

b. do not create light trespass or veiling glare issues for the adjacent Roadways and land uses.

5-3.1.1.3 Twin Brooks Station

A. Per the HFDG, Twin Brooks Station must be Designed and Constructed as an At-Grade local Station.

B. Twin Brooks Station must be Designed and Constructed according to the character-defining architectural elements described in Section 5-3.1.2 and be in alignment with CPTED principles as per Section 2-4 [*Crime Prevention Through Environmental Design (CPTED)*] of this Schedule.

C. The Twin Brooks Station should be Designed and Constructed to be a safe, comfortable, and convenient point of access to public transit in the Twin Brooks neighbourhood.

D. Barrier-Free access must be provided:

1. throughout Twin Brooks Station and all Station-area points of entry and circulation, generally; and

2. to the north and south ends of the Platform, specifically, from the SUP west of the Station via:

a. GCWS controlled At-Grade pedestrian Trackway crossings; and

b. sloped walkways or ramps and level landings.

E. The following are additional key site context factors for Twin Brooks Station that the Design Builder must consider in the Design and Construction of the Station and the immediately surrounding urban realm and connecting elements:

1. The Trackway, Station, and Station access points are located within a narrowing segment of an existing landscaped Roadway framed by:

    a. two Roadway intersections, one to the north and one immediately south, of E-W collector roadways with the adjacent N-S arterial (111 Street NW);

    b. the N-S arterial Roadway (111 Street NW) running east of and parallel to the LRT ROW; and

    c. multiple rear yards of single-family dwellings, on the west side of the LRT ROW, and separated from the Roadway and LRT ROWs by a visual screen fence by others.

2. The south end of the Station is immediately east and adjacent to the north of, respectively:

    a. an existing gas station, convenience store, and surrounding pad retail parking area; and

    b. a revised Roadway intersection, to be Designed and Constructed as part of the Project, to include an east-to-west At-Grade crossing of the LRT ROW.

F. The new Station, in terms of function, character, identity, scale, massing, and materials, must fit – physically and architecturally – within this non-street-facing, suburban context in order to create:

1. a neighbourhood transit node that is easy to identify as part of the Project;

2. a complementary civic presence within the surrounding community; and

3. a coherent and coordinated public realm.

G. The Design and Construction of the Twin Brooks Station and its immediately adjacent public spaces, including the SUP and At-Grade pedestrian Trackway crossings, must:

1. visually connect and unify the space between the Platform area on the west side of the Station and the visual screen fence (work by others) immediately west and adjacent to the relocated SUP;

2. be minimally obstructive to clear sight lines throughout the Station area;

3. be minimally intrusive to the adjacent residential land uses with respect to light and noise trespass; and

4. incorporate, coordinate, and architecturally integrate the following elements throughout the furthest north and south extents of the Station:

    a. pedestrian-scaled lighting along the adjacent SUP;

    b. Trackway barriers;

    c. Station identification signage;

    d. SUP paving patterns, colours and materials;

    e. other vertical infrastructure and Utilities elements within or adjacent to the Trackway including but not limited to: OCS poles, GCWS elements, signal masts, utility meters, and signals bungalows; and

f. be in alignment with CPTED principles as per Section 2-4 [*Crime Prevention Through Environmental Design (CPTED)*] of this Schedule.

5. accommodate the safe and efficient removal of snow and the relocation and storage of snow on site without negatively impacting the safety, enjoyment and accessibility of the Station and the surrounding public realm including walkways, SUP, and pedestrian At-Grade Trackway crossings.

5-3.1.1.4 Anthony Henday TPSS

A. Anthony Henday TPSS should be Designed and Constructed according to the character-defining architectural elements described in Section 5-3.1.2 and be in alignment with CPTED principles as per Section 2-4 [*Crime Prevention Through Environmental Design (CPTED)*] of this Schedule.

B. The Anthony Henday TPSS is based on a site:

1. within the southern boundary of the Transportation Utility Corridor that contains Anthony Henday Drive;

2. near a treed berm overlooking a storm water management facility:

a. immediately north of a suburban residential subdevelopment of mainly single-family dwellings, most with rear yards within 150 m of the site;

b. used as a visual and recreational amenity by the adjacent community and nearby residents whose homes to the near south, southwest and southeast, overlook the facility.

C. The following are additional key site context factors:

1. The site is:

a. reached only by a restricted access service road extending from the nearby Llew Lawrence OMF to the southeast;

b. not directly accessed from or adjacent to a public walkway, community pathway, or SUP; and

c. partially treed at the north side of the storm water facility. Refer to Section 2-3.5 [*Zone D*: *Wetland Character Zone*] and Section 2-9.6.7.3 [*Specialty Area 3: SWMF Landscape Requirements*] of this Schedule for tree and shrub removal, protection, addition and replacement.

2. The public realm consists of:

a. the stormwater management facility;

b. a network of nearby informal trails; and

c. paved community pathways that border the SWMF to the immediate south.

3. Portions of the upper south elevation as well as of the east and west elevations and roof of the TPSS are within a view shed:

a. extending from the rear yards of several single-family homes west, southwest and southeast of the site;

b. extending from the eastbound and westbound lanes of Anthony Henday Drive some 250 m due north of the site.

D. The Design and Construction of the Anthony Henday TPSS and its principal site access point, driveway, parking, walkways, and directly abutting sloped site must:

1. situate the building near the north edge of the SWMF;

2. establish a building set back minimum from the high-water level of the SWMF based on:

   a. meteorological, geotechnical and hydrological engineering analysis; and

   b. suitability of the site subsurface characteristics to safely and durably support the TPSS and all required surface and subsurface infrastructure.

3. not encroach into the adjoining TUC by more than 7 m;

4. arrange and align the building and all associated landscaping, infrastructure, building and site program space to:

   a. visually integrate the building while mainly screening the adjacent site program areas;

   b. orient the high point of the TPSS roof and possible clerestory glazing band to the south so that the wooden soffit and glazing is visible to the immediately adjacent pedestrian pathways around the SWMF and the surrounding residential neighbourhoods;

   c. provide sufficient vehicle manoeuvring space and turning movements within the TPSS parking area; and

   d. permit safe and efficient snow removal and the relocation and storage of snow on site.

5. address the potential need for additional visual screening and the architectural impacts of further landscape modifications such as berms, removal and replacement or protection of existing trees, retaining walls, and enhanced drainage away from the south, east, and west sides of the building.

6. integrate site lighting and access control features that:

   a. mitigate unauthorized access to the site and building rooftop from all sides of the building; and

   b. mitigate light trespass from exterior lighting to the nearby residential land uses.

5-3.1.1.5 Llew Lawrence OMF UC

A. The Llew Lawrence OMF UC should be Designed and Constructed according to the character-defining architectural elements described in Section 5-3.1.2 [*Character-Defining Architectural Elements: General*] of this Schedule and be in alignment with CPTED principles as per Section 2-4 [*Crime Prevention Through Environmental Design (CPTED)*] of this Schedule.

B. The Llew Lawrence OMF UC is based on a site that should be:

1. Located to the north and east of the Llew Lawrence OMF to allow for:

   a. open space between the two facilities for:

      i. paved service/maintenance vehicle parking;

      ii. site circulation; and

      iii. landscaping.

b. convenient and safe access distances between the Llew Lawrence OMF, UC, and nearby parking facilities; and

c. the least amount of impervious, paved surfaces.

2. Provide maintenance and other service vehicle access parameters as part of and in accordance with the HFDG and the Design and Construction scope of the Llew Lawrence OMF.

3. Provide sufficient vehicle manoeuvring space and turning movements within the UC parking area.

4. Be able to accommodate safe and efficient snow removal and the relocation and on-site storage of snow.

5. Be set back a sufficient distance from the Llew Lawrence OMF access road to permit other landscape, site fencing or other structures as may be provided within the Llew Lawrence OMF scope.

5-3.1.1.6 Heritage Valley North Station and Utility Complex

A. The Design Builder must Design and Construct the Heritage Valley North Station in accordance with the requirements of the HFDG for a multi-modal interchange as well as an interim terminus/transfer station.

B. The Heritage Valley North Station and UC should be Designed and Constructed according to the character-defining architectural elements described in Section 5-3.1.2 and be in alignment with CPTED principles as per Section 2-4 [*Crime Prevention Through Environmental Design (CPTED)*] of this Schedule.

C. The Heritage Valley North Station and UC must be Designed and Constructed to be parts of an integrated whole that includes and incorporates the existing Heritage Valley Transit Centre as well as consideration for the future TOD site. Refer to Figure 5-3.1.2.6.a [*Heritage Valley North Station Urban Integration Concept Diagram*] of this Schedule.

D. The Design and Construction of the Station and UC must draw upon, complement, and enhance the architectural expression, character and identity of the existing Heritage Valley Transit Centre.

E. The scale, massing, materials and other character-defining elements of the new Station and UC, when applied and delineated appropriately in this context, must help to establish:

1. an attractive, welcoming, and coordinated ensemble of civic architecture;

2. a successful transit-oriented precinct where planned adjacent developments will support and be supported by the infrastructure;

3. a coherent, safe, and walkable public realm; and

4. an efficient multi-modal transit node.

F. The following are key site context factors that the Design Builder must consider in the Design and Construction of the Station, UC, and adjacent public realm:

1. The Trackway, Station, Utility Complex, and Station access points are located west of the existing Heritage Valley Transit Centre, north of Ellerslie Road and east of Heritage Valley Trail SW on land currently zoned as ‘Agricultural’ and having the following characteristics:

a. predominantly undeveloped land;

b. adjacent to major Roadways;

c. street grid is mostly absent within adjacent developable parcels except for existing Roadways connections to the Park and Ride facility and a bus loop accessing and circulating through the adjacent Heritage Valley Transit Centre; and

d. minimal bicycle and pedestrian connectivity to existing residential areas.

2. The Station, UC, and existing Heritage Valley Transit Centre sites are described within the current City of Edmonton Transit Oriented Development Guidelines as an "Employment" Station-area type wherein a future TOD may have the following appropriate characteristics:

   a. low-rise professional offices and services, such as corporate headquarters or research and development uses;

   b. medical campus/hospital use;

   c. major transit park & ride facility at select Stations adjacent to major Roadways;

   d. street-oriented employment and neighbourhood serving retail;

   e. higher density residential uses;

   f. street grid throughout development sites; and

   g. improved pedestrian and bicycle connectivity to surrounding neighbourhoods.

3. Based on the City of Edmonton Transit Oriented Development Guidelines, the Design-Builder must consider the likely outcomes of future TOD development within 400 and 800 m of the Station with respect to:

   a. *Land Use and Intensity Expectations*, especially as to how these might influence the scale, form, massing and character of adjacent development and therefore the same aspects of the Station architecture at the likely interfaces of the new Station and an adjacent TOD.

   b. *Building Site and Design* and how adjacent TOD could activate and engage the public realm at the key Station-TOD interface(s) especially with respect to likely or desirable shared street frontage, setbacks, transitions, landscaping, surface parking, roof form and sight lines or view sheds.

   c. *Public Realm* as it applies to appropriate architectural and urban design responses at the TOD-Station interface(s) to adjacent Roadway design, pedestrian crossings, block size and configuration, laneways or mid-block accessways, public boulevards or urban plazas, street trees, lighting and Utilities, SUP and bicycle facilities.

   d. *Urban Design and CPTED* as these relate to the "Principles" (Urbanism, Design Excellence, Scale, Connections and Context) and descriptions set out in the City's Transit Oriented Design Guidelines and the City's Transit Oriented Development Policy (C565).

4. The Design-Builder must provide Barrier-Free access throughout the Station and all Station-area and Platform points of entry and circulation, including but not limited to:

   a. a system of new, and reconfigured existing, pedestrian links comprising:

      i. walkways and plaza spaces to the east of the Station;

      ii. tactile guidance and warning systems that build upon and extend existing infrastructure;

iii. At-Grade LRT Trackway crossing facilities at the north and south ends of the Platform, respectively. Refer to Section 5-3.4.1 [*General Requirements*] and Section 5-3.4.2 [*Station Access and Egress: Twin Brooks and Heritage Valley North*] of this Schedule; and

iv. sloped walkways or ramps and level landings linking the north and south ends of the Platform to the At-Grade pedestrian crossing facilities.

b. new pedestrian crossings of the transit centre bus loop that link to the northeast and southeast corners of the Station and the north and south walkways, landings and rail crossings described in Section 5-3.4.1 [*General Requirements*] and Section 5-3.4.2 [*Station Access and Egress: Twin Brooks and Heritage Valley North*] of this Schedule;

c. an existing east-west SUP on the north side of Ellerslie Road at the south end of the Station; and

d. existing pedestrian walkways flanking an existing east-west access road to the north of the Station and leading to:

i. the new rail crossings, sloped walkways or ramps, and level landings at the north end of the Station as described in Section 5-3.4.1 [*General Requirements*] and Section 5-3.4.2 [*Station Access and Egress: Twin Brooks and Heritage Valley North*] of this Schedule;

ii. directly south of and past, in an east-west direction, the new UC.

G. The Design and Construction of the Heritage Valley North Station, UC, and all associated linking elements must:

1. be minimally obstructive to clear sight lines through and across the Station and between the Station and the adjacent new and existing infrastructure as well as to and from potential street-facing TOD immediately west of the Station;

2. incorporate architectural features that, visually and spatially, address and accommodate:

a. pedestrian walkways and plaza spaces parallel and immediately adjacent to the east and west sides of the Station and the south end of the UC;

b. circulation nodes at the northeast and southeast corners of the Station where bus loop crossings of the adjacent transit centre meet the ground level walkway parallel to the east side of Station; and

c. Patron entry and egress points at the north and south ends of the Station.

3. be in alignment with CPTED principles as per Section 2-4 [*Crime Prevention Through Environmental Design (CPTED)*] of this Schedule.

4. accommodate the safe and efficient removal of snow and the relocation and storage of snow on site without negatively impacting the safety, enjoyment and accessibility of the Station and the surrounding public realm.

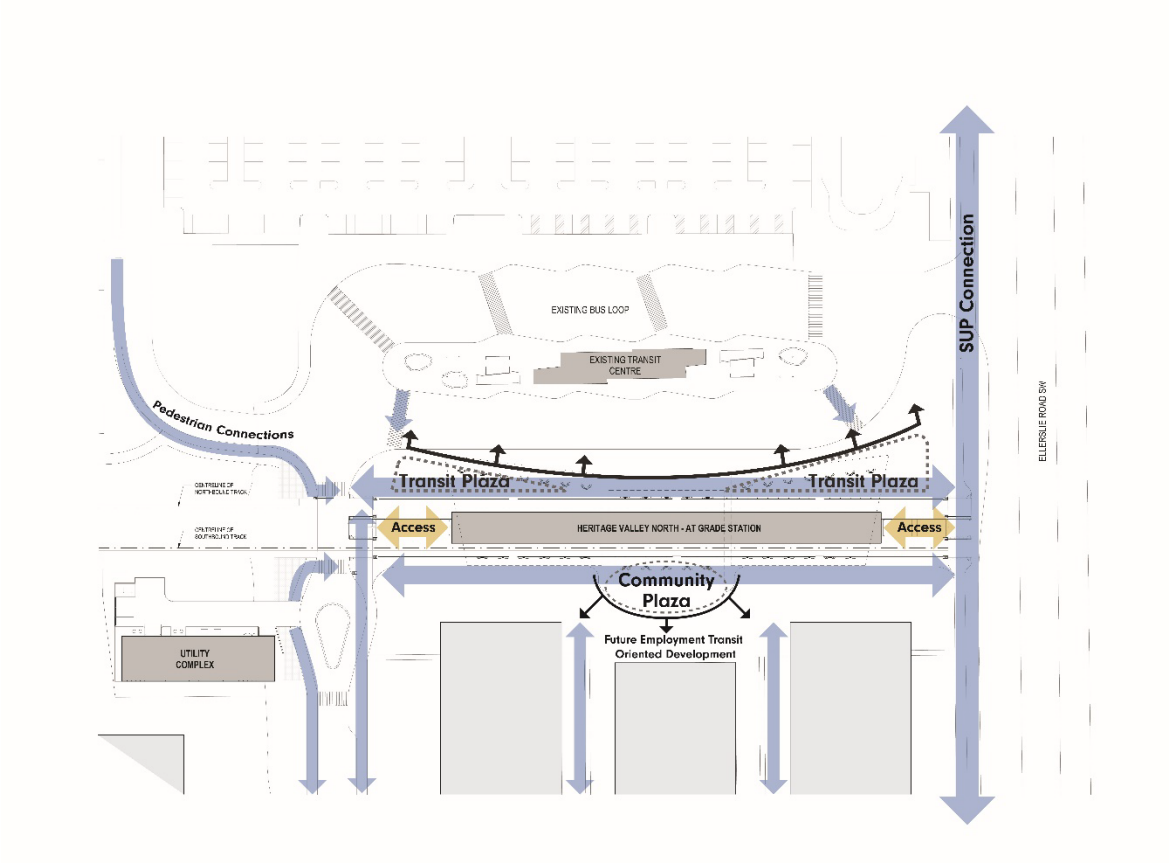


Figure 5-3.1.2.6.a Heritage Valley North Station Urban Integration Concept Diagram

5-3.1.2 Character-Defining Architectural Elements

A. Character-defining architectural elements are those features or attributes of the Station, Utility Complex or TPSS that, in fulfilling their primary functions, must:

1. simultaneously address the main contextual and architectural opportunities and constraints of their respective sites. Refer to Section 5-3.1.1 [*Station, Utility Complex, and Traction Power Substation Site Contexts and SUI Project Requirements*] of this Schedule;

2. achieve good urban integration, locally, through a combination of scale, massing, geometry, materials, connectivity and accessibility; and

3. effectively balance the needs of integrating with the context or contexts peculiar to each site with the need to also create a coherent and recognizable identity for the Project as a whole.

B. Without limiting the Project Requirements set out in this and other Schedules, the Design and Construction of the Station, UC, and TPSS Facilities should:

1. incorporate the character-defining architectural elements as stipulated in Section 5-3.1.2.1 [*Character-Defining Architectural Elements of the Twin Brooks and Heritage Valley North Stations: Common*], Section 5-3.1.2.2 [*Site-Specific Character-Defining Architectural Elements: Twin Brooks Station*], Section 5-3.1.2.3 [*Site-Specific Character-Defining Architectural Elements:*

Heritage Valley North Station], and 5-3.1.2.4 [*Character-Defining Architectural Elements; Utility Complexes and TPSS*] of this Schedule.

5-3.1.2.1 Character-Defining Architectural Elements of the Twin Brooks and Heritage Valley North Stations: Common

A. The main, character-defining architectural elements common to Twin Brooks and Heritage Valley North Stations are:

1. 125 m long, center-loading, At-Grade Platforms, accessed at each end of the Station through:

    a. a network of safe and convenient Barrier-Free pedestrian links, Roadway crossings, neighbourhood walkways, and SUPs;

    b. pedestrian At-Grade crossings of one or both Trackways; and

    c. sloped walkways or ramps and level landing areas that are fully coordinated and architecturally integrated with:

        i. the adjacent At-Grade pedestrian Trackway crossing(s), all vertical Trackway infrastructure, Trackway barrier assemblies; and

        ii. intersections, access points or other connecting elements that must safely guide Patrons and other facility users to, through or past the Stations.

2. Distinctive Platform canopies with:

    a. Platform coverage, scale, and geometry calibrated to their respective Station types, sizes, and unique urban contexts;

    b. roof edge, fascia and soffit material palette common to all new Project Facilities;

    c. elevations that are matched, overall, to the longitudinal slope of the Platform and the immediately adjacent Trackway, not a horizontal absolute; and

    d. regularly spaced, normal-to-horizontal supporting columns combining primary structural elements with other architectural and structural enhancements that:

        i. complement each Station's particular scale, function, architectural expression and identity;

        ii. create element-to-element transition features; and

        iii. where required, organize, visually conceal, protect, and provide secure Maintenance access to mechanical and electrical infrastructure per the design parameters set out in other parts of this Schedule. Refer to Section 5-3.5.1.1.E, Section 5-3.5.2.1.B.2, Section 5-3.5.2.2.A.6 and Section 5-3.5.2.2.A.7 of this Schedule.

3. Platform canopy soffit assemblies featuring solid wood plank:

    a. aligned perpendicular to the Platform edge;

    b. providing a continuous, single plane matched to the overall section geometry and slope of the canopy structure that:

        i. permits clear sightlines through the Station and visually and spatially unifies the Platform area beneath the canopies;

ii. conceals from view and physically protects the canopy roof cavity and structural elements by prohibiting bird roosting by and access to insect vermin;

iii. eliminates hanging or suspended lighting, Platform equipment, signage, and digital advertising displays; and

iv. may be employed as part of a Station noise control or Platform speech intelligibility system.

c. incorporating fully recessed LED strip lighting. Refer to Section 5-3.14.11 [*Lighting*] of this Schedule. Recessed lighting to:

i. produce safe, even illumination for the Platform edge, Platform circulation areas, and Patron waiting amenities throughout the Platform area beneath the canopy;

ii. prevent light trespass to adjacent residential land uses;

iii. visually accentuate the colour, texture and pattern of the wood soffit;

iv. enhance the identity and architectural expression of the Station within its context when viewed from adjacent public realm areas during non-daylight hours; and

v. permit remote LED driver locations with secure, safe and ready access for Maintenance and replacement outside of all catenary clearances. Refer to Typical Platform Section Diagram (available as Disclosed Data).

d. concealing and protecting roof drainage and power and data infrastructure running horizontally within the roof soffit, while providing secure Maintenance access.

4. Patron circulation, waiting amenity, and Platform furnishing and equipment zones that are uncluttered, intuitive and symmetrically arranged about the Platform midpoints.

5. Full-height, rectangular, heated Platform Shelters featuring:

a. vertical, mullion-less (i.e. no externally mounted mullion caps) glass wall panels with:

i. structural silicone vertical and horizontal joints; and

ii. panel sizes optimized for economies of scale and ease and safety of replacement.

b. fabricated steel substructures that are:

i. visually unobtrusive; and

ii. delineated, vertically and horizontally, in a manner that is architecturally and structurally coordinated, at a minimum, with the joint and structural member spacing of the glass wall, precast Platform, and canopy assemblies.

c. Barrier-Free access, floor area, seating, and thermal controls, in accordance with the requirements of Chapter 10 of the HFDG and Chapter I of the City's ADG, to comfortably and safely accommodate users of all abilities, in all weather; and

d. enhanced user safety through effective, two-way natural surveillance of and from, respectively, the Shelters, the Station, and its immediate surroundings.

5-3.1.2.2 Site-Specific Character-Defining Architectural Elements: Twin Brooks Station

A. In addition to the elements described in Section 5-3.1.2.1 [*Character-Defining Architectural Elements of the Twin Brooks and Heritage Valley North Stations: Common*] of this Schedule, the following are character-defining architectural elements unique to the Twin Brooks Station:

1. A minimum 7.33 m wide Platform that fits within a narrow right-of-way while being fully compliant with the requirements of Chapter 10 of the HFDG and Chapter I of the City's ADG.

2. A continuous canopy structure, centered on the Platform, covering no less than 70 percent of the Platform length with:

   a. a scale and profile appropriate for a local station in accordance with Chapter 10 of the HFDG in a narrow transportation right-of-way in close proximity to the adjacent residential community;

   b. regularly spaced canopy columns comprising:

      i. built-up AESS elements that can incorporate fabricated steel cantilever arms to support wayfinding and VMS signage above the Platform;

      ii. an architecturally integrated system of full height, formed metal shrouds, complete with secure Maintenance access points, to conceal all vertical services runs, wet and dry.

   c. canopy column, column shrouds, column cantilever arms, TVM and Patron waiting Shelter structures, and Shelter fenestration elements that are arranged, vertically and horizontally (normal and parallel, respectively), relative to the horizontal, not Platform or immediately adjacent Trackway slope.

5-3.1.2.3 Site-Specific Character-Defining Architectural Elements: Heritage Valley North Station

A. In addition to the elements described in Section 5-3.1.2.1 [*Character-Defining Architectural Elements of the Twin Brooks and Heritage Valley North Stations: Common*] of this Schedule, the following are character-defining architectural elements unique to the Heritage Valley North Station:

1. A 9.0 m wide, 125 m-long Platform that is:

   a. fully compliant with the requirements of Chapter 10 of the HFDG and Chapter I of the City's ADG;

   b. centred, longitudinally, between the north and south pedestrian At-Grade Trackway crossings so as to incorporate identically equipped, sloped walkway systems for Patron access at each end of the Platform. Refer to Section 5-3.4.1 [*General Requirements*] and Section 5-3.4.2 [*Station Access and Egress: Twin Brooks and Heritage Valley North*] of this Schedule].

2. Overall canopy architectural expression that:

   a. is consistent with or resonant of the roof forms and overall geometric and architectural coherence of the adjacent, existing Heritage Valley Transit Centre;

   b. is consistent with the overall architectural expression of public-facing transit infrastructure in the Project;

   c. provides no less than full coverage of the Platform;

   d. incorporates features that permit daylight penetration to the Platform; and

e. create an appropriately scaled architectural gesture and urban design response to the public realm spaces and future TOD directly west of the Station:

i. respond to the public realm circulation and plaza spaces linking the adjacent pedestrian plaza and linking elements described in Section 5-3.1.2.1 [*Character-Defining Architectural Elements of the Twin Brooks and Heritage Valley North Stations: Common*] of this Schedule.

5-3.1.2.4 Character-Defining Architectural Elements: Utility Complexes and TPSS

A. The character-defining architectural elements of the UCs and TPSS should be based on:

1. site context and building program;

2. a shared, Project-wide identity and architectural expression; and

3. UC/TPSS community fit balanced with overall system character and identity.

B. The UC and TPSS locations as described in Section 5-2.1.1 [*Station, Utility Complex, and Traction Power Substation Site Contexts and SUI Project Requirements*] of this Schedule must be based on:

1. SUI and facility architecture having the following three essential dimensions or objectives:

a. reducing the visual impact of the vertical (non-building) system infrastructure in the right-of-way;

b. fully integrating and coordinating the right-of-way vertical system infrastructure with or at:

i. Station and UC/TPSS architecture;

ii. landscape and urban design; and

iii. other key system interfaces between all Project infrastructure and the adjacent existing and planned new land uses, buildings and facilities throughout the alignment.

2. Human factors, in accordance with the requirements of the HFDG Chapter 1 – “General”, and the convenience and safety of exterior access points for City employees, authorized Utility agents and systems contractors.

C. Without limiting the provisions and requirements for the UC and TPSS facilities set out elsewhere in this Schedule or the HFDG Chapter 1 – “General”, Chapter 3 – “Clearances and Right-of-Way”, Chapter 6 – “Traction Power”, Chapter 8 – “Communications”, Chapter 10 – “Stations and Ancillary Facilities” and Chapter 17 – “Streets”, the key influences and drivers of the character-defining architectural elements of all UC and TPSS that must be taken into consideration by the Design Builder in the Design and Construction of these facilities are as follows:

1. Program, recommended minimum room areas, functional relationships, and rectangular building footprint in accordance with the requirements of the HFDG Chapter 10 – “Stations and Ancillary Facilities”.

2. Internal circulation, access to daylight, and other direct connections to the building exterior as dictated by, but not limited to, the following site variables:

a. land use, topography, site orientation, site access and parking;

b. geodetic parameters related to the locations of underground Utilities, Traction Power, signals and communications infrastructure next to the building;

c. access to and orientation of the site and building with respect to normal Maintenance activities with respect to:

   i. timing and frequency;

   ii. mitigation of noise and light trespass; and

   iii. sight lines or view sheds from or to adjacent land uses or public realm.

d. activation of and engagement with the public realm as influenced by:

   i. adjacent street or other frontages, setbacks, transitions, landscaping, and surface parking

   ii. scale, form, massing and character of adjacent developments.

e. CPTED principles, including but not limited to:

   i. natural surveillance of the building and site

   ii. natural access control

   iii. territorial reinforcement

   iv. connectivity

   v. community culture

3. Site access, parking and external Maintenance access point configuration with respect to the following building-specific variables:

   a. fire and life safety requirements of the NBCAE and NFCAE

   b. roof storm water drainage infrastructure that must be:

      i. located completely outside of and never above any space housing sensitive Traction Power, Signals and Communications, or other critical supporting electrical infrastructure; and

      ii. readily and safely accessed for Maintenance inside the building;

   c. room and equipment spatial and environmental parameters such as:

      i. location, nature, and extents of required foundation, floor slab, and exterior wall assembly penetrations and connections;

      ii. thresholds of and environmental controls for light and thermal energy, gas- and liquid-phase substances;

      iii. horizontal and vertical limits of and required clearances to the principal Traction Power and Communications equipment and their respective below grade building entry and connection facilities; and

      iv. horizontal and vertical limits of, and required clearances for, the arrangement, concealment, or obscuring from building exterior view, the mounting and distribution of suspended mechanical, electrical, and fire suppression systems.

   d. Maintenance access to externally mounted building electrical and mechanical services and Utilities metering equipment.

D. Based on the foregoing, the Design-Builder should incorporate the following character-defining architectural elements in the Design and Construction of all UCs and TPSS facilities:

1. Site:

a. vehicle access, circulation, and parking facilities that:

i. comply with, at a minimum, the HFDG Chapters 1, 6, 10, and 17 and Chapters 1 and 3, Appendices A through F, and the Construction Specifications within Volume 2 of the D&CS;

ii. prioritize the safety and convenience of access to the main facility for all users;

iii. enable and support the ease, safety, and manoeuverability of vehicles whether for direct access to or parking near the building exterior or to other in-ground or surface-mounted building equipment and Utilities infrastructure;

iv. permit safe and efficient snow removal and the relocation and storage of snow on site; and

v. greatly reduce or eliminate negative impacts on adjacent land uses and the public realm with respect to sightlines (good natural surveillance), noise, air quality, and light trespass into adjacent sensitive land uses from site lighting and vehicle headlights.

b. slopes of paved and unpaved surfaces and all associated storm water drainage elements optimized to:

i. positively slope away from the building and all exterior pad or surface-mounted building services and Utilities equipment;

ii. discharge as safely, durably, and directly as possible into the site storm water management system;

iii. eliminate ponding or areas of perched water, whether from precipitation or Maintenance activities, on any permeable or impermeable surface adjacent to the building or throughout the parking and exterior surface-mounted building services and Utilities areas; and

iv. eliminate differential settlement and control any structural movement between the building and any adjacent or directly abutting paved walkway, apron, or driveway structures.

c. architecturally integrated yard enclosures that:

i. materially and geometrically and in terms of scale and expression are a coherent extension to the UC architecture;

ii. accommodate exterior, pad-mounted building mechanical systems equipment thereby eliminating the need for rooftop equipment mounting and associated roof access systems and openings;

iii. incorporate safe, secure, and convenient Maintenance access;

iv. visually obscure all exterior pad-mounted building mechanical systems equipment and any associated wall penetration points from nearby public realm or regularly occupied adjacent land use spaces;

v. attenuate equipment noise to the degree necessary where and when it exceeds the statutory limits of the Noise Control articles of the City's *Community Standards Bylaw,* 14600*;*

vi. prevent the creation of an 'attractive nuisance' by being non-climbable; and

vii. eliminate areas for concealment of unauthorized users or activities per Section 2-4 [*Crime Prevention Through Environmental Design (CPTED)*] of this Schedule.

2. Building foundation, floor slab, and slab edge elements that are:

   a. set at elevations relative to an adjoining grade, walkway, apron and driveway so as to:

      i. provide and promote positive drainage away from the building face, door thresholds and interior floor surfaces;

      ii. prevent moisture ingress or accumulation at the floor slab-to-exterior wall junction; and

      iii. prevent the accumulation of or infiltration by precipitation or meltwater into the joint between the building foundation and any directly abutting walkway, plaza, or raised planter structure.

   b. structurally integrated with and having sufficient vertical extents to support:

      i. a continuous vertical drainage plane, insulation cavity, and air space coplanar with and matching that of the surmounting exterior wall assemblies;

      ii. an external, durable and impact-resistant wall base cladding element, aligned with and matched to the surmounting wall cladding in terms of thermal, drainage, and ventilation characteristics and performance; and

      iii. an adjacent and abutting system of concrete walkway and doorway apron slabs.

3. Building façade, comprising opaque exterior wall and transparent exterior glazing assemblies that are:

   a. durable, energy-efficient, and vandal resistant per the recommendations and requirements of the reference standards within this Schedule including but not limited to:

      i. Chapters 4 through 10 of CSA S478 Guideline on Durability in Buildings

      ii. Chapter 3 of the NECB

      iii. HFDG Section 10 - "Materials and Finishes"

      iv. Chapter 4 of the Edmonton Facility Consultant Manual Volume 2

   b. matched according to a materials palette and architectural expression common to all UC and TPSS buildings of the Project and those of the existing Heritage Valley Transit Centre with respect to:

      i. relative size, proportion, horizontal datums and vertical extents of the respective material, component, and assembly types, colours, textures, and patterns;

      ii. geometric variability introduced by site-specific differences in building orientation, functional program, or topography.

c. integrated with respect to the principal organizing subdivisions of the building superstructure, interior program, and the location and arrangement of:

   i. exterior glazing and door assemblies;

   ii. building envelope drainage, deflection, and drying components;

   iii. joint, reveal, closure, or other material and assembly transitions both in- and out-of-plane; and

   iv. abutting or adjoining raised planter, retaining wall, sidewalk or plaza paving structures.

d. organized and delineated in elevation as three distinct horizontal bands or zones of building envelope materials, components, and assemblies, wrapping the building exterior and expressed as:

   i. base: concrete ledger or 'baseboard' to provide a continuous horizontal datum and physically robust material transition between the intermediate wall above and immediately adjacent grade;

   ii. intermediate: opaque exterior wall of stack bond brick masonry throughout, having punched openings at all doors and a continuous, projecting string course or shadow line of pre-finished metal, set into the wall at person-door head height, to add a unifying visual datum and human scale to the wall; and

   iii. upper: clerestory band that combines areas of transparent glazing, for daylighting of interior program space, with contiguous, opaque infills of architectural louver and pre-finished metal-clad wall elements, arranged and apportioned to accommodate through-wall penetrations for building ventilation and to transition, architecturally, from intermediate wall to roof low point.

e. aligned for continuity and integrity of interior partition-to-exterior wall junctions that abut or join to vertical window mullions to:

   i. maintain a consistent and architecturally coordinated set of subdivisions or module widths for clerestory glazing and opaque wall and louver assemblies;

   ii. achieve and sustain fire-resistance ratings;

   iii. minimize thermal bridging and eliminate condensation on interior wall and glazing surfaces; and

   iv. optimize visual continuity of the exterior wood soffit and adjacent, coplanar interior wood ceilings visible through the clerestory windows.

4. Building roof having:

   a. possibly asymmetrical, shallow 'V' and mono-pitch sloped assemblies for the UC and TPSS buildings, respectively;

   b. interior vertical clearances between the underside of exposed roof structure or wood soffit, sufficient to accommodate all suspended or ceiling-mounted service elements and all required vertical clearances above floor-mounted equipment housed within the respective UC or TPSS program spaces;

c. roof drain locations with internal rainwater leaders that are never above sensitive ceiling-suspended service runs nor within any Traction Power, signals and communications, or other supporting electrical, mechanical and Utilities equipment;

d. roof overhangs that:

i. provide added weather protection to the upper clerestory and intermediate wall zones as well as to the adjoining building access walkway below;

ii. eliminate direct solar gain through all clerestory glazing, regardless of aspect or orientation, when measured at the noon azimuth on the summer solstice.

e. may incorporate a wood soffit assembly for the mounting of parallel planks at exterior roof overhangs and at ceilings above adjoining interior spaces having exterior walls with clerestory glazing:

i. expressed, architecturally, as a continuous and aligned plane extending across any directly adjoining interior ceilings but only to the extents that are visible, At-Grade, from the building exterior;

ii. aligned perpendicular to the building long axis;

iii. interrupted, visually, only by the top of the clerestory band and interior partitions;

iv. mounted to, supported by, and concealing completely the underside of building roof structure above all interior program areas served directly by the clerestory glazing;

v. providing sufficient vertical clearance from the underside of structure for fully concealing from view all interior horizontal lighting power and control circuitry within the soffit.

f. roof edge fascia and parapet cladding panels, panel joints, and assembly transitions:

i. matched to and optimized with the combined depth of the roofing, structural and soffit assemblies;

ii. coordinated and aligned with the vertical window mullions and opaque panel subdivisions of the clerestory band directly beneath.

5. Reflected ceiling plan that is optimized for:

a. horizontal distribution of building mechanical and electrical systems that are organized into:

i. rational, vertically tiered and parallel arrangements of main and right-angled branch building services runs;

ii. architecturally coherent, regularly spaced, safely and easily accessed suspension and attachment points and service module or terminal elements.

b. suspension of building mechanical and electrical infrastructure within and its confinement to either:

i. open-ceiling zones above and within corridors and perimeter program areas without clerestory glazing; or

ii. wood ceiling/soffit zones above all interior program areas served directly by clerestory glazing.

c. suspended and fully coordinated direct and direct/indirect LED lighting systems and controls for:

i. glare-free, general interior lighting of all interior spaces aligned with the underside of the clerestory fenestration;

ii. up-lighting of ceilings in all program areas with wood soffits when occupied, temporarily, for Maintenance activities that take place during non-daylight hours.

d. fully coordinated arrangements of architectural-quality building ventilation, lighting, and fire suppression infrastructure in wood ceiling/soffit zones that:

i. eliminate visual clutter above clerestory sill height;

ii. provide minimally obstructed views to the ceiling plane;

iii. eliminate direct line-of-sight from outside the building, At-Grade, to any interior light source.

5-3.2 ACCESSIBILITY AND SAFETY

5-3.2.1 General Requirements

A. Station connecting elements, waiting amenities and each supporting tactile, visual and auditory interface must be Designed and Constructed for Patrons of all abilities to:

1. provide a Patron experience that is safe, convenient, and comfortable at any hour the Station is accessible to the public and in all weather;

2. provide Barrier-Free access to and movement through and around all parts of the Station available for Patron use; and

3. provide direct, Barrier-Free, safe and functional pedestrian paths of travel between Stations and any adjacent or nearby SUP, pedestrian sidewalks, Trackway and road crossings, bus stops, and the existing Heritage Valley Transit Centre.

B. The Design and Construction of all Stations, UCs, TPSS, and signals and communications bungalows, including their respective interior and exterior service spaces, building systems, components, and assemblies, must ensure:

1. the ease with which regular Maintenance, repair and replacement processes or activities can be planned and safely conducted throughout each facility whether by:

a. City Maintenance and operations personnel; or

b. other authorized Maintenance and electrical, sewerage and water, Utilities and telecoms service providers

2. that the interaction between facility Design and the size, weight, and other physical properties of typical Maintenance materials, equipment, and replacement modules have also been considered with respect to:

a. human factors - HFDG Section 1.3.8 – “Human Factors” and Section 1.3.9 – “Maintenance”

b. materials and equipment handling for either in-situ or off-site repairs or replacement.

5-3.2.2 Specific Requirements

A. Platform edge tactile attention indicators must be 915 mm wide and consist of a 305 mm wide anti-slip ribbed texture placed along the trackside edge of the Platform and a 610 mm wide CSA B651.18 compliant truncated dome detectable warning surface, as illustrated in Figure 5-3.2.2.a [*Typical Platform Edge Plan Detail*] and Figure 5-3.2.2.b [*Typical Platform Edge Section Detail*] of this Schedule:

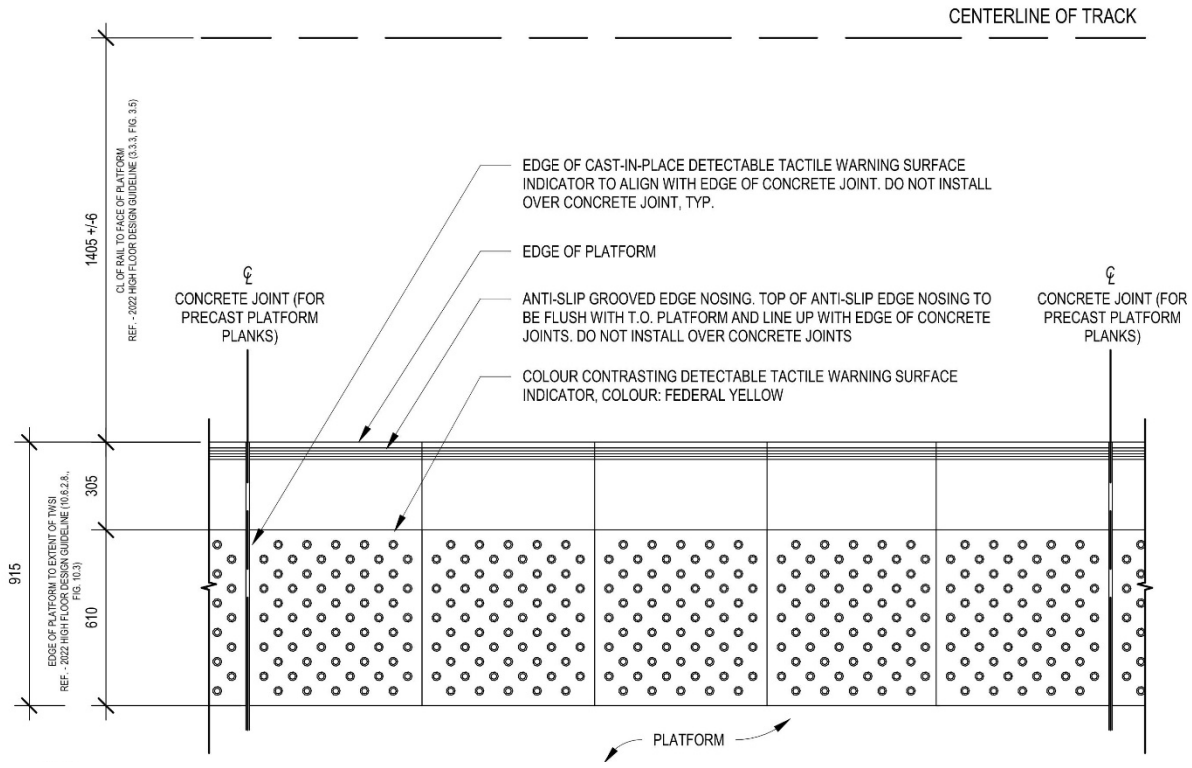
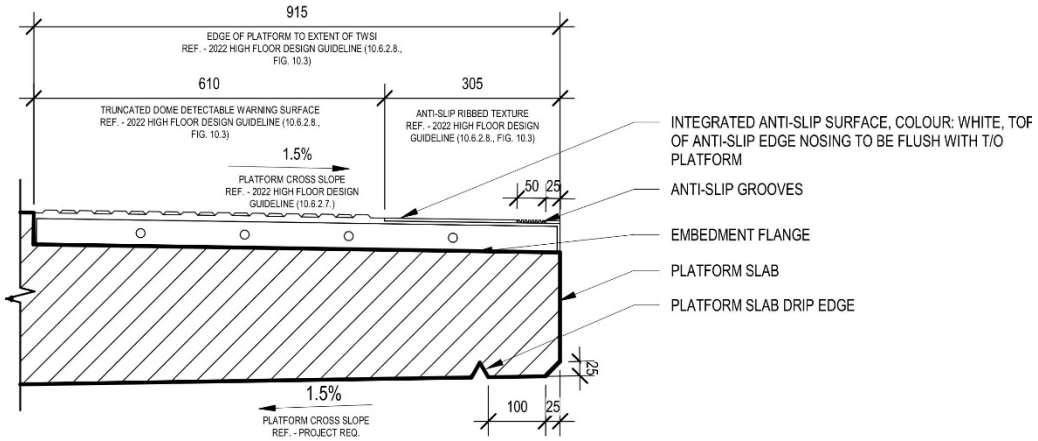


Figure 5-3.2.2.a Typical Platform Edge Plan Detail



NOTE: EDGE OF TACTILE WARNING STRIP TO BE FLUSH WITH EDGE OF PLATFORM

Figure 5-3.2.2.b Typical Platform Edge Section Detail

B. Accommodation of all required Barrier-Free clearances, tactile warning zone, Patron waiting amenities, Shelter and Platform furnishings and equipment in the center portion of the Platform must be achieved on all Platforms.

C. Without limiting the requirements of the HFDG and the City's ADG, the following minimum project-specific Barrier-Free clearances are to be prioritized and achieved:

1. the minimum Pedestrian Clear Width, from the rear of the 915 mm wide tactile warning zone to the nearest continuous obstruction on the Platform must be 1800 mm in conformance with the requirements of Section I.3 of the City's ADG; and

2. all door openings accessible to the public at Stations, including at heated Platform Shelters, must have a minimum clear width of 910 mm.

3. All Platform Shelters must provide for and be capable of incorporating and supporting the potential future inclusion of a matching glass swing door leaf meeting the minimum project-specific Barrier-Free requirements and door operating clearances.

D. The area east of the Heritage Valley North Station must be provided with tactile direction indicator surfaces in compliance with Section 4.3.5.4 of CSA B651 and must be coordinated with and connected to all similar systems providing detectable guidance from all adjoining transit facilities to the Station.

E. All doors available for public use at Stations must be equipped with a Barrier-Free operator and activated through an Accessible hand swipe sensor.

5-3.3 STATION EMERGENCY EGRESS AND EXITING

A. Analysis and calculation: an Appropriate Person must perform all required emergency egress and exiting calculations in conformance with the requirements of the HFDG utilizing the City-provided projected ridership data as Disclosed Data for the Project.

B. Without limiting the provisions and requirements of the HFDG and NFPA 130, the following performance parameters should be used for the analysis:

1. Projected Ridership: Refer to Tables 5-3.3.A and 5-3.3.B below. For Station occupant load calculations, the 2050 boarding, alighting and link load numbers for the AM peak (northbound direction) should be used for the analysis.

2. Peak Period Duration: The AM peak (northbound) is 1 hour (between 7:30 AM and 8:30 AM) and the peak period is 15 minutes or three, 5-minute headways

3. Surge Factors:

   a. Twin Brooks Station: 1.5

   b. Heritage Valley North Station: 2.0

4. Missed Headway Direction: Is in the AM peak direction only (per NFPA 130 5.3.2.5(3)) and the level of service disruption is two missed headways.

5. LRV dwell times at Platforms are not provided and do not form part of the Station occupant load or timed egress calculations per NFPA 130.

6. Capital Line LRT operates 5-LRV consists during peak service times with an LRV maximum (crush load) capacity of 200 passengers per LRV.

Table 5-3.3.A: Projected AM Peak Hour Ridership: 2050

	link	Heritage Valley North Station	link	Twin Brooks Station	link	
Southbound	500	Boarding: 3590	930	Boarding: 420	920	1 hr.
Northbound	4530	Alighting: 570	7970	Alighting: 50	8340	1 hr.

Table 5-3.3.B: Projected PM Peak Hour Ridership: 2050

	link	Heritage Valley North Station	link	Twin Brooks Station	link	
Southbound	1680	Boarding: 430	4530	Boarding: 70	4640	1 hr.
Northbound	940	Alighting: 2960	1260	Alighting: 150	1290	1 hr.

C. The Design-Builder must ensure that all required life safety and building code-related analyses, timed egress calculations and any variances needed as part of the permitting process are carried out to the satisfaction of the Authority Having Jurisdiction.

5-3.4 STATION ACCESS AND PEDESTRIAN CIRCULATION

5-3.4.1 General Requirements

A. The Design and Construction of all Station access and pedestrian circulation elements must incorporate new and existing pedestrian facilities serving each Station.

B. All infrastructure, new and existing, must be combined into a coordinated, visually coherent, legible and Patron-oriented urban realm.

C. The constructed building infrastructure must be an environment that generously accommodates all active modes of travel and that provides direct, safe, and comfortable access to all Station areas accessible to the public utilizing elements that include, but are not limited to:

1. exterior links between Platforms and adjacent transit centre plaza spaces, SUPs, sidewalks, and other neighbourhood pedestrian networks;

2. pedestrian crossings of adjacent LRT Trackways, roads, and transit centre bus loops;

3. landscape, paving surface and Station-area edge treatments, Trackway barriers and other elements of Station adjacent segments of the SUP network, sidewalks, Roadway crossings and plazas;

4. Station-specific and system-wide pedestrian Trackway and Roadway crossing signage and signals;

5. system-wide and character zone-specific wayfinding and other directional signage;

6. exterior, pedestrian-scaled lighting throughout each of the above connecting elements; and

7. fully coordinated and integrated pedestrian At-Grade crossings of one or both Trackways including, but not limited to:

a. GCWS devices;

b. Trackway emergency exit gates;

c. tactile walking surface indicators;

d. precast crossing panels;

e. Trackway barrier and walkway guard and railing assemblies; and

f. sloped walkways or ramps and level landing areas that connect the pedestrian At-Grade crossings to the Platform.

5-3.4.2 Station Access and Egress: Twin Brooks and Heritage Valley North

A. The Design and Construction of Patron access and egress facilities for Twin Brooks and Heritage Valley North Stations as described in this Section and the Typical Platform Section Diagram and At-Grade Platform Access Diagram (available as Disclosed Data) must include the following connecting elements:

1. A system of sloped walkways or ramps serving the south and north ends of the Station that:

a. connect the Platform to At-Grade pedestrian Trackway crossing facilities at each end of the Station. Refer to Section 5-3.4.1 [*General Requirements*] of this Schedule and the 'At-Grade Platform Access Diagram' available as Disclosed Data. Incorporate landings equally spaced between the Platform end and At-Grade landings as required;

b. maintain a consistent slope and meet the requirements of the HFDG and ADG but with no ramp slope steeper than 1:16 permitted;

c. provide at least one and preferably both connections to the Platform at each Station as a maximum 1:20 sloped walkways with an intermediate landing unless precluded by site constraints;

d. maintain the required minimum clear emergency egress width as per NFPA 130 through all portions of the system of walkways and landings; and

e. incorporate hand and guardrail assemblies that:

i. safely guide, confine, and support, variously and as required, Patrons of all abilities, entering and exiting the Station, throughout the entire walkway system from each of the Platform access points through to the At-Grade crossings;

ii. provide an attractive, durable, architecturally coordinated and integrated ensemble of balusters, guards, railings, component connections, and assembly anchorage points.

2. Pedestrian Trackway crossing facilities as required to safely convey pedestrians across one or both Trackways and to directly connect the Station access facilities described in Section 5-3.4.1 [*General Requirements*] to all new or existing public walkways, plazas or SUPs directly adjacent to the Stations such that:

a. the placement and operation of crossing barriers, signal masts, or other wayside equipment does not reduce the required minimum clear emergency egress width for the Station as per NFPA 130 through each crossing. Refer to Section 5-3.3 [*Station Emergency Egress and Exiting*] of this Schedule and Part 6 [*Systems*] of this Schedule;

b. the width of the Trackway crossing maintains or exceeds the required Station emergency egress width as calculated per NFPA 130. Refer to Section 6-3.1.3.8 [*At-Grade Crossings*] of this Schedule for At-Grade crossing requirements;

c. the arrangement and equipping of each intersection between the pedestrian Trackway crossings and the adjacent or connecting public walkways or SUP must safely guide and alert Station Patrons and other users:

i. accessing the At-Grade crossings;

ii. moving through or past these intersections; and

iii. travelling in any direction, at any time of day, and under all weather conditions.

5-3.4.3 Off-Platform Public Areas

5-3.4.3.1 General

A. Station Area Lighting:

1. Without limiting the requirements set out in the HFDG, the City of Edmonton Road and Walkway Lighting Design Standards, and Section 5-3.14 [*Building Electrical*] of this Schedule, the Design and Construction of the Station area lighting includes the adjacent pedestrian-oriented urban realm within the Project extents and must:

a. be fully coordinated and integrated with the overall lighting design of the Station and all new and existing adjacent public realm areas with respect to:

i. luminaire and lighting mast Design Data, whether of custom fabrication or regular manufacture, as it pertains to colour temperature, size, geometry, materials, finishes, mountings and fastenings, pole bases and lamp arms;

ii. quality, scale and character as these relate to the overall Project identity, architectural expression, and urban design

b. CPTED principles as per Section 2-4 [*Crime Prevention Through Environmental Design (CPTED)*] of this Schedule

2. Off-Platform, Station-area pedestrian lighting must, at a minimum, be similar in quality to the lighting used throughout the Platform and Station Patron access system with respect to:

a. lighting mast and luminaire geometries;

b. materials, finishes, assemblies and components consistent with and appropriate to a high-quality urban environment;

c. durability and corrosion resistance consistent with and appropriate to a service environment where frequent snow and ice clearing from platform, walkway and plaza surfaces as well as from adjacent Roadways are typical maintenance activities through 6 or more months each year employing:

i. vehicle-mounted, power-assisted, and hand-operated equipment,

ii. de-icing agents.

B. Station Area and Trackway pedestrian guards, railings, and channelization barriers:

1. Without limiting the requirements set out in the HFDG or other parts of this Schedule, the Design and Construction of all barriers separating pedestrian walkways, plaza areas or SUP from the Trackway that are within the extents of the Twin Brooks and Heritage Valley North Stations, must:

    a. be part of an architecturally integrated and coherent design that, at a minimum, must:

        i. incorporate all At-Grade crossings;

        ii. provide clear sightlines between the Platform and adjacent and adjoining public walkways, SUP, or plaza areas from any point or viewing angle from within, on, or along any Station and Station area elements accessible to the public;

        iii. reinforces and is consistent with a Project-wide architectural and urban design identity.

    b. treat the Trackway barrier as part of a unified and fully coordinated architectural and urban design that includes and incorporates, at a minimum, all other adjacent, adjoining or abutting:

        i. Station access guard and handrail systems

        ii. pedestrian lighting

        iii. station identification signage

        iv. OCS poles

        v. any other vertical infrastructure that may be co-aligned with the barrier system

    c. adjoin to or transition from the typical, non-Station-area Trackway barrier system in a manner that does not result in vertical gaps between the respective systems greater than 100 mm.

2. Station-area Trackway barriers must, at a minimum, be of similar quality as the guards and railings used throughout the adjacent and connecting Platform access system with respect to:

    a. durability of materials, finishes, fabrication, assembly and erection;

    b. continuity and consistency of architectural character and expression.

5-3.4.3.2 Twin Brooks Station

A. In addition to meeting the general requirements set out in Section 5-3.4.3.1A of this Schedule, the Design and Construction requirements for off-platform area pedestrian lighting for Twin Brooks Station are as follows:

1. Off-Platform, Station-area pedestrian lighting must, at a minimum, be provided along the SUP directly west of the Station:

    a. extending from the northmost extents of the north pedestrian At-Grade crossing of the outbound Trackway to the southmost extents of the south pedestrian At-Grade crossing;

    b. along the east side of the SUP in a manner that does not:

        i. interfere with or otherwise impede safe passage through the Station area by any SUP users;

        ii. create light trespass, veiling glare, or other negative visual impacts on the adjacent residential land uses directly west of the Station.

B. In addition to meeting the general requirements set out in Section 5-3.4.3.1B of this Schedule, the Design and Construction of Station Area and Trackway pedestrian guards, railings, and channelization barriers for Twin Brooks Station are as follows:

1. Station-area Trackway barriers must be provided along the east side of the SUP directly west of the Station:

    a. extending, at a minimum, from the north pedestrian At-Grade crossing of the SB Trackway to the south pedestrian At-Grade crossing;

    b. at the west edge of the outbound Trackway in a manner that:

        i. maintains a unified visual and spatial connection between and across the SUP, the SB Trackway, and the Platform, throughout the west side of the station, from At-Grade crossing to At-Grade crossing;

        ii. conforms with Volume 2 of the D&CS including but not limited to Chapters 3.2, 3.5, 3.7, Tables 3.7, 3.10, 3.11, 3.30, 3.31, and Appendixes C and E; and

        iii. enables and sustains safe, unimpeded passage through the Station area by all SUP users, year-round and at any time of day.

5-3.4.3.3 Heritage Valley North Station

A. In addition to meeting the general requirements set out in Section 5-3.4.3.1A of this Schedule, the Design and Construction requirements for off-platform area pedestrian lighting for Heritage Valley North Station are as follows:

1. Off-Platform, Station-area pedestrian lighting must, at a minimum, be provided throughout the pedestrian spaces that surround the Station:

    a. from the northmost extents of the north pedestrian At-Grade crossing of the Trackway to the southmost extents of the south pedestrian At-Grade crossing;

    b. along the walkways and plaza spaces immediately east and west of the Station in a manner that does not:

        i. interfere with or otherwise impede safe passage through the Station area by any facility users;

        ii. create light trespass, veiling glare, or other negative visual impacts on any of the adjacent Roadway, transit centre, or future TOD land uses.

B. In addition to meeting the general requirements set out in Section 5-3.4.3.1B of this Schedule, the Design and Construction of Station Area and Trackway pedestrian guards, railings, and channelization barriers for Heritage Valley North Station are as follows:

1. Station-area Trackway barriers must be provided along the east side of the SB Trackway and west side of the NB Trackway through the Station:

    a. extending, at a minimum, from the north pedestrian At-Grade crossing of the Trackway to the south pedestrian At-Grade crossing;

    b. in a manner that:

i. maintains a unified visual and spatial connection between and across the NB and SB Trackways, the Platform, the adjacent walkway and plaza spaces, and the north and south pedestrian At-Grade crossings;

ii. conforms with Volume 2 of the D&CS including but not limited to Chapters 3.2, 3.5, 3.7, Tables 3.7, 3.10, 3.11, 3.30, 3.31, and Appendixes C and E; and

iii. enables and sustains safe, unimpeded passage through the Station area by all facility users, year-round and at any time of day.

5-3.4.3.4 Bicycle Storage: Heritage Valley North Station

A. Bicycle Storage Facility:

1. The Design-Builder must locate and provide rough-ins for a future bicycle storage facility that, at a minimum, is in conformance with the requirements of:

   a. HFDG Chapter 14 – "Urban Integration"

   b. Volume 2 Chapters 3 and Appendix F of the D&CS

   c. City's Bike Plan – Chapter 9

      i. Bicycle storage facilities must be situated to maximize visibility and must be placed within clear sight of the applicable Station and to permit the future construction of:

         i.) safe, convenient and direct connections between the facilities and the nearest SUP

         ii.) sufficient paved area around the facility to permit all required access and egress

      ii. Access to and exit from bicycle parking spaces must be provided with an aisle of not less than 1.5 m in clear width, including between rows of bicycle parking.

      iii. Bicycle parking spaces and accesses must be located on hard-surfaced areas.

      iv. The basis of design for bicycle storage at Stations are free-standing, galvanized, standard weight, surface-mount inverted "U" bike racks.

      v. In quantities that are in accordance with Section 5-3.4.3.4.B of this Schedule.

B. The Design-Builder must Design and Construct, at a minimum, all storm water drainage, power, data and other infrastructure rough-ins as needed for the future construction of a fully enclosed facility for the weather-protected and secure storage of 25 bicycles at the Station having the following features:

1. Concrete-slab-mounted inverted "U" type racks compliant with Volume 2 of the D&CS, Construction Specifications Part 7.2 and the City's *Zoning Bylaw*,12800, Part I, Clause 54.5.

2. An exterior enclosure system of fabricated internal steel structure and external glass walls and roof that incorporates:

   a. ceiling-mounted interior LED lighting, occupancy sensor and photocell;

   b. card-key security access for shelter doors; and

   c. a minimum of two CCTV camera positions.

5-3.5 STATION DESIGN

5-3.5.1 Platforms

5-3.5.1.1 Platforms: General

A. As character-defining architectural elements, the Platforms for Twin Brooks and Heritage Valley North Stations must be Designed and Constructed to be in alignment with the Platform-related requirements set out in Section 5-3.1.2 [*Character-Defining Architectural Elements: General*] of this Schedule.

B. Without limiting the requirements set out in Section 5-3.1.2 [*Character-Defining Architectural Elements: General*] of this Schedule and in Figure 5-3.5.1.1a [*Typical Platform Mounting Conditions*] of this Schedule or elsewhere in these Project Requirements, all horizontal and vertical clearances and construction tolerances for the Trackway, Platform, and Platform crawl space at each Station must, at a minimum, be in conformance with the requirements of:

1. HFDG Chapters 1, 3, 5, 6, and 10
2. Chapter I of the ADG
3. NFPA 130 Part 5 and Annexes A and C

C. The Design and Construction of Twin Brooks and Heritage Valley North Stations must incorporate a center-loading Platform.

D. All Platforms must be Designed and Constructed utilizing precast concrete Platform panels. Refer to Section 4-4.7 [*Precast Concrete*] of this Schedule and Section 5-3.12 [*Acceptable Materials and Finishes*] of this Schedule. The panels must be of architectural-quality finish, fabricated off-site and installed to create a Platform that is:

1. highly impervious to the penetration of chemical de-icing agents or other water-borne chlorides;
2. uniform in plane and true to line across sloped, crowned, side and vertical trackside edge surfaces;
3. free of serious casting defects or damage caused during handling, storage or erection such as cracking, spalling, bug holes, honeycomb, surface crusts, and significant variations in colour or tone per the requirements of CSA A23.4 and recommendations and guidelines of PCI MNL-116 and MNL-117;
4. complete with joint sealant and sealant support assemblies at panel-to-panel, column-to-panel, and all other through-panel joints or penetrations that are:
    a. fully adhered and free from de-bonding, cracking, or subsidence;
    b. water-tight and impervious to leaks to the platform crawl space below;
    c. of high-durometer composition that will not puncture or yield under high point loads as may be caused by walking aids or footwear having narrow, pointed heels; and
    d. modulus of elasticity and adhesion properties that maintain joint integrity under all anticipated in- and out-of-plane movement of any joint-forming element.
5. slip-resistant under wet and dry conditions. Refer to Part 4.3.7 of the Edmonton Facility Consultant Manual Volume 2;
6. free of lipped edges at joints between adjacent panels;

7. optimized and coordinated with respect to panel width, Platform equipment mounting points, and through-panel penetrations based on:

    a. a maximum panel-to-panel joint width of 19 mm;

    b. creating the least number of non-standard or single-use, non-repeatable panel types and widths;

    c. aligning with and incorporating:

        i. major subdivisions of the structurally independent, through-panel Station canopy columns and below-panel foundation systems;

        ii. crawl space access points, heated Shelter structures, and glazing support systems.

8. consistent and uniform in surface texture and colour or tone throughout;

9. easily maintained and cleaned utilizing:

    a. manual and power-assisted methods and equipment for the removal of snow and ice;

    b. non-abrasive and environmentally safe cleaning agents for the ready removal of chewing gum, soft drink stains, and other detritus typical of outdoor Platforms.

10. free from ponding of any depth or areal extent;

11. complete with all required, through-panel structural block-outs for the following [refer to *Figure 5-3.5.1.1a* showing typical through Platform and surface mounting conditions for precast panels], except where City supplied Platform equipment mounting may require alternate solutions:

    a. Platform equipment, pole, cabinet and furnishing mountings;

    b. sleeved utility penetrations,

    c. localized slab depressions or cast-in curbs

E. Exposed mechanical and electrical services that are not permitted on any part or area of the Platform visible to the public above finished grade include but are not limited to:

    a. electrical conduit and junction boxes;

    b. hose bib (to be concealed in column base shroud, with lockable access door, nearest to water meter);

    c. recessed service floor boxes (except for hose bib water meter access at Twin Brooks Station);

    d. heat trace cables, grounding cables or grounding cable bonding tails or stub-outs;

    e. rainwater leader, floor or trench drains; and

    f. water, gas, or air lines.

F. Platform edges must be Designed and Constructed in accordance with Section 5-3.2.2 [*Specific Requirements*] of this Schedule, including Figure 5-3.2.2a [*Typical Platform Edge Plan Detail*] and Figure 5-3.2.2b [*Typical Platform Edge Section Detail*] of this Schedule.

G. All Platform runoff must be shed and discharged into the Trackway Stormwater Management System.

H. Access for service and Maintenance to the crawl space at Twin Brooks and Heritage Valley North Stations must be:

1. Provided from the Platform to track level via the sloped Patron access walkways and landings at the north and south ends of each Station. Refer to Section 5-3.4.2 [Station Access and Egress: Twin Brooks and Heritage Valley North] of this Schedule.

2. Designed and Constructed to provide direct and safe points of entry to the Platform crawl space or into fully coordinated below-Platform Traction Power, signals and communications, or other Utilities pull-box or vault locations.

3. Where required for access to the Platform crawl space, utilize standard-diameter City utility manholes that are:

   a. no closer than 300 mm, or distance as determined by the Appropriate Person to avoid structural reinforcement conflicts, of precast panel from the longitudinal Platform centerline to the rim of the manhole measured from a line tangent to the manhole rim and parallel to the Platform centreline;

   b. no closer than 300 mm to Platform panel edge measured from a line tangent to the manhole rim and parallel to the joint between adjacent and abutting panels;

   c. flush and coplanar with the surrounding Platform surface with no edge or cover protruding above or recessed below the surrounding Platform surface by more than 3 mm;

   d. free and clear of all Platform furnishings, equipment and Shelters; and

   e. readily identifiable by standard City lettering and logo manhole cover castings.

4. Optimized and coordinated for safety and ease of movement during typical Maintenance activities in the Platform crawl space with respect to quantity, location and sizes of:

   a. canopy superstructure penetrations through the precast panels;

   b. Platform canopy, panels, and grade beam bearing elements such as pile caps, cross-beams, and column bases;

   c. code-required smoke break and fire compartmentalization elements; and

   d. Maintenance access points for canopy drainage, Station electrical, and plumbing infrastructure

5. Equipment mounting to the Platform structure must be according to the Design and Construction parameters as set out in Figure 5-3.5.1.1a [*Typical Platform Mounting Conditions*] of this Schedule and the following requirements:

   a. all materials used for mounting and attachment to the Platform must:

      i. be inherently and highly corrosion resistant and galvanically compatible to a degree commensurate with the service environment and the materials being joined, attached, or that are used to fasten, join or attach;

      ii. never incorporate, adjoin or combine dissimilar metals or materials; and

      iii. be arranged and affixed to:

         i.) protect and conceal from view all mounting fasteners;

ii.) not interfere with the incorporation and complete concealment of grounding cables, bonding points, or any electrical power and data supply conduits and cables;

iii.) permit drainage and enhance drying of the whole assembly;

iv.) enhance the durability and maintain the structural and visual integrity of the overall assembly and its constituent parts;

v.) prevent tampering but readily enable Maintenance and replacement; and

vi.) prevent the ingress of water through to the crawl space below.

b. through-panel openings designed to be cored after panel installation are permitted only when they:

i. cannot reasonably be accommodated as part of the panel casting process;

ii. are clearly identified as such on the Design Data and shop drawings authenticated by the Appropriate Person for the precast panel fabricator;

iii. are circular in plan, vertical, and smaller than 150 mm in diameter; and

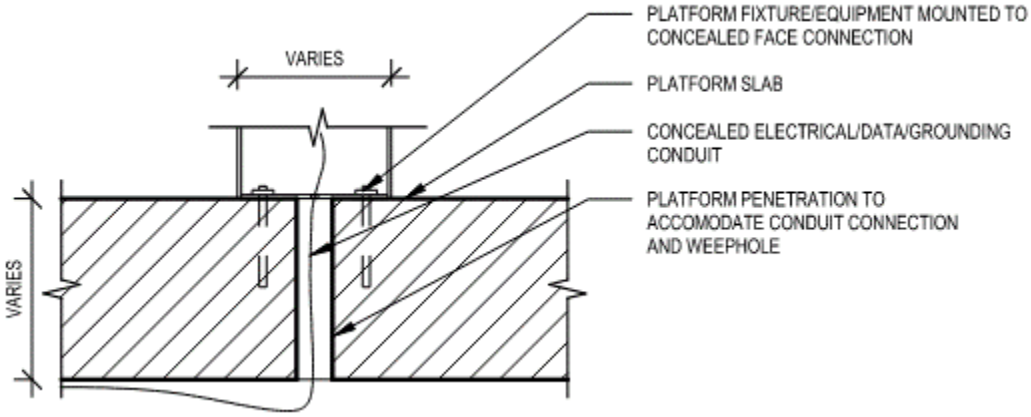
iv. are used exclusively for the mounting of and routing of concealed services to Platform equipment and furnishings;

v. have been approved by the City prior to installation following submittal, by the Design-Builder, of an authenticated review by the precast panel fabricator's Appropriate Person with respect to, at a minimum:

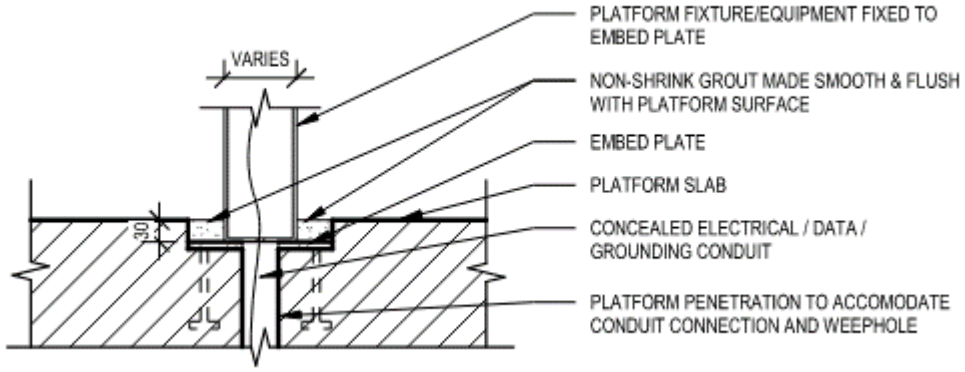
i.) panel structural performance;

ii.) durability impacts; and

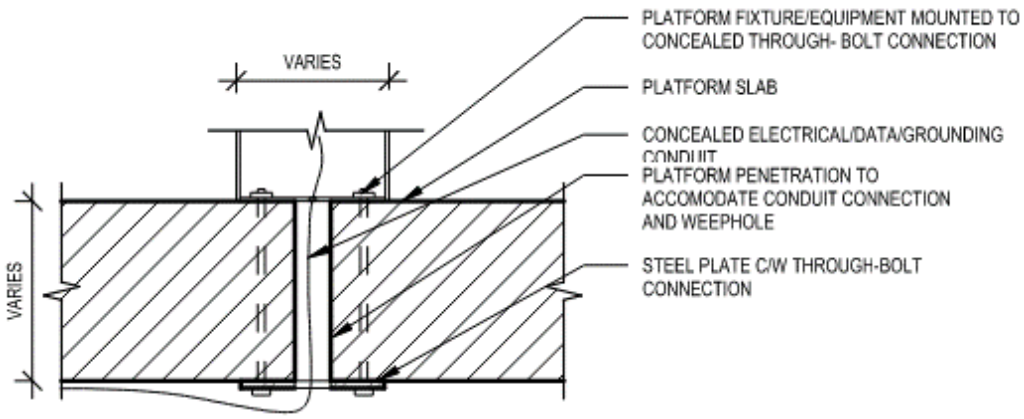
iii.) opening size and minimum offsets to panel internal reinforcing, panel edges and other adjacent Platform equipment mountings.



1. Typical Equipment Mounting: Face Mounted



2. Typical Equipment Mounting: Recessed Flush Mount



3. Typical Equipment Mounting: Undermount Through-Platform

Figure 5-3.5.1.1.a Typical Platform Mounting Conditions

5-3.5.1.2 Platforms: Station-Specific

A. The Design and Construction of the Twin Brooks and Heritage Valley North Platforms must be based on the following dimensions:

1. Twin Brooks Station: minimum 7.33 m wide, measured horizontally between the vertical faces of opposite trackside edges, and 125 m long, exclusive of required Platform-end landings for Station access walkways;

2. Heritage Valley North Station: 9.0 m wide, measured horizontally, between the vertical faces of opposite trackside edges and 125 m long, exclusive of required Platform-end landings for Station access walkways.

B. Without limiting the requirements set out elsewhere in this and other Schedules of the Project Requirements with respect to Trackway alignments, elevations, and orientation, the Twin Brooks and Heritage Valley North Platforms must be Designed and Constructed to fully accommodate:

1. Station access systems and pedestrian Trackway crossings at each end of the platform. Refer to 5-3.4.1 [*General Requirements*] of this Schedule and 5-3.4.2 [*Station Access and Egress: Twin Brooks and Heritage Valley North*] of this Schedule.

2. All other vertical infrastructure within the Trackway including but not limited to:

   a. signals bungalows

   b. ETS Clock Tower at Twin Brooks Station

   c. Track-mounted vehicle arrestors at Heritage Valley North Station

5-3.5.2 Canopies

5-3.5.2.1 Canopies: General

A. As character-defining architectural elements, the Station canopies for Twin Brooks and Heritage Valley North Stations must be Designed and Constructed to be in alignment with the canopy-related requirements set out in Section 5-3.1.2 [*Character-Defining Architectural Elements: General*] of this Schedule.

B. Without limiting the canopy-related requirements set out in Section 5-3.1.2 [*Character-Defining Architectural Elements: General*] of this Schedule, the Design and Construction of all Platform canopies must:

1. Adopt and architecturally integrate the necessary minimum clearances to the canopy structure and all supporting superstructure(s) stipulated in the HFDG for the OCS and Design Vehicle Dynamic Envelope.

2. An architecturally coherent and integrated system of material, component and assembly attachment throughout all canopy and column elements with:

    a. no exposed fasteners

    b. no exposed cables, conduits, junction boxes or other secondary, surface-mounted covers or concealment systems; and

    c. consistent and coordinated mounting heights in conformance with the requirements of the HFDG

3. Coordinate, integrate and conceal from view, completely, all required Platform canopy mechanical and electrical services runs, horizontal and vertical, wet and dry:

    a. within a dedicated and architecturally coherent system of concealing elements;

    b. at-structure, never within closed, hollow structural sections.

4. Incorporate robust and secure Maintenance access points for all concealed services that are:

    a. logical and intuitive with respect to quantity, placement, opening size and operation;

    b. seamlessly integrated with the surrounding materials, assemblies, and components of the concealing system with respect to geometry, materials, finish, pattern and orientation.

5. Incorporate canopy roofing, roof drain, parapet, fascia and other roof-edge components and assemblies that:

    a. eliminate roof ponding and overflow scuppers completely;

    b. utilize dedicated rainwater leader, directly connecting each roof drain to the receiving storm line below the Platform;

    c. eliminate drainage or dripping of precipitation from any canopy roof surfaces onto Platform, ground, or other adjacent walking surfaces and areas used by Patrons or pedestrians; and

    d. prevent snow and ice falling onto areas accessible to persons or vehicles.

6. Incorporate snow guard systems, where required, as an integral part of the roofing assembly, with all components supplied by one manufacturer.

7. Incorporate non-proprietary, architecturally integrated fall-protection systems.

8. Maintain canopy fascia at a consistent vertical depth throughout and with the narrowest roof edge profile achievable within the following key parameters:

    a. depth of the structural elements that support the canopy roof;

    b. minimum canopy depth needed between the top of soffit and underside of structure to route and conceal:

        i. insulated rainwater leader from roof drain outlet to top of vertical drops at structure or at dedicated wall chases at Platform Shelter structures or Platform utility buildings;

        ii. horizontal service runs for power and data cabling or conduit.

    c. minimum roof edge parapet height needed to provide an extent of roof membrane return over and past the parapet sufficient to not impact the manufacturer's warranty.

9. Incorporate, throughout all Platform canopy sections, a soffit having or incorporating the following features and properties:

    a. creates a continuous plane between all canopy edges made entirely from solid wood planks;

    b. conceals all horizontal canopy roof structural elements;

    c. aligns plank joints perpendicular to the track edge of the Platform;

    d. attaches to the underlying structure with no visible connections;

    e. provides general area, Shelter interior, and Platform-edge illumination beneath the canopy utilizing evenly spaced, fully recessed linear LED luminaires that must:

        i. align with the orientation of the wood soffit planks;

        ii. create a continuous line, from track edge-to-track edge, uninterrupted by any surface-mounted canopy elements or column penetrations; and

        iii. break across and abut to the fully recessed interior and exterior faces of heated Shelter glazing head assemblies.

    f. utilizes an architecturally coherent and coordinated system of transitions at changes in plane and between canopy materials, components and assemblies;

    g. permits unobstructed clear views along either side of the Platform to any Station wayfinding signage and VMS display. Refer to Section 5-3.8 [*Station Signage*] of this Schedule;

    h. prohibits, completely, the mounting to or suspension from the soffit of any wayfinding or regulatory signage, VMS displays, City video displays, sensors, Platform Shelter radiant heating appliances or any related fitments and accessories. Refer to Section 5-3.5.3 [*Platform Shelters*] of this Schedule;

    i. incorporates an applied wood finish that is:

        i. compatible with and enhancing of the species, grade and other physical properties of the wood with respect to colour, pattern, texture, and resistance to the deleterious effects of moisture and UV light;

ii. durable, transparent, weatherproof, and uniform in colour, tone, and transparency across the whole of the soffit; and

iii. matched to or coordinated with the colour and finishes of architectural wood elements used on similar City facilities nearby, new or existing, including transit centres and UCs.

10. Canopy extents along the trackway that must:

    a. have vertical fascia along the trackside edges of the canopy that are coplanar with the trackside edges of the Platform; or

    b. provide full coverage of the adjacent trackway and portions of the public realm immediately east and west of the station.

11. The canopy roof structure must be supported on a system of evenly spaced columns that:

    a. if on the Platform, built-up AESS columns are:

        i. spaced to optimize precast Platform panel widths and transverse joint spacing centered on the columns;

        ii. spaced to optimize vertical mounting and horizontal spacing requirements of the Station wayfinding and VMS signage assemblies in conformance with the requirements of the HFDG and the ETS Graphic Standards Manual (available as Disclosed Data);

        iii. spaced to optimize required minimum area, spacing, mounting and structural support of all heated Platform Shelters, equipment and furnishings;

        iv. spaced to optimize vertical wet and dry (mechanical and electrical) services runs between the canopy and the Platform crawl space;

        v. fabricated to incorporate cantilever arms for the mounting and structural support of Station wayfinding signage, VMS displays, and regulatory signage;

        vi. complete with a hot-dipped galvanized finish; and

        vii. incorporate Section 5-3.5.2.1.B.12 to Section 5-3.5.2.1.B.15.

    b. if off the Platform, are fully coordinated and integrated with, at a minimum:

        i. all Trackway barrier assemblies;

        ii. all required OCS infrastructure offsets and clearances; and

        iii. pedestrian walkway and plaza paving, plantings, lighting, and other landscape elements.

    c. If off Platform, need not incorporate Section 5-3.5.2.1.B.12 to Section 5-3.5.2.1.B.15

12. Canopy columns must incorporate identical, full height formed metal shroud assemblies extending:

    a. horizontally and symmetrically from the north and south sides, respectively, of each AESS column; and

    b. vertically, from the underside of the Platform to the underside of the canopy.

13. Column-shroud assemblies must incorporate and conceal all roof drainage, electrical and data services runs required to connect:

    a. Platform-mounted marshalling cabinets to column-mounted wayfinding and VMS signs to soffit-mounted lighting, cameras and loudspeakers; and

    b. canopy roof drainage to the stormwater main beneath the Platform crawl space.

14. Column-shroud assemblies must:

    a. conceal and segregate, as needed, all wet and dry services contained within;

    b. create two equally sized and identically shaped vertical compartments or chases, one on each side of the column, that:

        i. will not decrease Platform clear widths. Refer to Section 5-3.5.1.1 [*Platforms: General*] of this Schedule;

        ii. do not have angled outside corners or edges that are damage-prone, reduce sightlines or create opportunities for concealment; and

        iii. protect recessed portions of the AESS column, where it penetrates the platform surface, that are prone to collecting precipitation and other debris.

    c. not cover track facing AESS column surface area required for mounting and support of Platform wayfinding and VMS signage;

    d. be fabricated from Type 316L stainless steel of sufficient gauge to be:

        i. highly durable and dent-resistant;

        ii. tight fitting with flush panel joints; and

        iii. true to line and free of oil-canning or other deformations imparted from internal panel stresses during fabrication or external stresses caused by improper mounting.

    e. be mounted to the underlying hot-dipped galvanised AESS substrate utilizing fastenings and secondary support elements that are corrosion-proof and galvanically compatible with the shroud material;

    f. extend through the depth of the Platform canopy wood soffit, completely, with a surrounding 12mm reveal between the outside face of the shroud and opening through the wood planking;

    g. extend through the depth of the Platform precast panels, completely, via geometrically matched cast-in openings with:

        i. a continuous 12 mm offset or joint between the column shroud and matched precast opening;

        ii. an elastomeric sealant assembly matched to and contiguous with the joint sealant assembly of the precast Platform panels.

    h. be flush with the inboard and outboard faces of the built-up structural column and incorporate continuous,12 mm wide vertical reveals at the shroud-to-column attachment point;

    i. be supported by and mounted to the column only and not the Platform or Platform substructure;

j. incorporate a formed hot-dipped galvanized metal plate shroud segment where the column meets the Platform surface that:

i. is integral with, identical in shape, and flush to the outside face of the adjoined formed metal shroud section above;

ii. is highly resistant to corrosion, denting and deformation caused by incidental impacts from Patron movements, typical Platform Maintenance activities, or willful acts of vandalism;

iii. is identical in height throughout all columns; and

iv. forms a constant horizontal upper datum or joint line at the connection to the upper shroud assembly within the range of 200 – 300 mm above the top of Platform.

k. incorporate a surface treatment across the entire formed metal plate segment at the column-Platform interface that:

i. creates visual contrast between the column and Platform for visually impaired Patrons utilizing a high-performance duplex coating; and

ii. is matched precisely in height and colour to an identical duplex coating on the exposed faces of the hot-dipped galvanized coated AESS column.

l. incorporate access panels:

i. fully integrated, flush-mounted, and secured with tamper-proof fastenings and closure elements;

ii. fabricated from matching material type and finish; and

iii. sized and located to provide safe and ready maintenance access to data and power junction and terminal points or rainwater leader cleanout and internal heat trace assemblies.

m. be equipped, where needed below the Platform and within the Platform crawl space, with corrosion-proof flashing elements that safely deflect away any water ingress from:

i. the column base-to-pile cap connection; and

ii. other sensitive infrastructure in the crawl space.

15. Station superstructure and foundation elements supporting the canopy superstructure must be Designed and Constructed to accommodate the coordination, integration, Maintenance access, and concealment requirements. Refer to Section 5-3.5.1.1 [*Platforms: General*] of this Schedule and the Typical Platform Section Diagram available as Disclosed Data.

C. Soffit lighting designs not conforming to 5-3.1.2.1.A.3.c.i. and iii of this Schedule, or 5-3.5.2.1.B.9.e.i., ii., and iii of this Schedule, will only be permitted in canopy soffits with a tapered cross section throughout the length of the canopy and at each canopy end, where:

1. the outboard, upward-sloping soffit planes of the tapered sections of the soffit fold or break at the inner edge of the Pedestrian Clear Width along straight vertices;

2. each outboard plane of the tapered soffit as described above terminates at the inside edge of a perimeter LED strip recess that is parallel to the Platform edge and is horizontal in cross-section;

3. the mounting of all recessed LED lighting in the soffit above the Platform equipment, furnishing, and Patron waiting amenities area achieves a bottom aperture that is:

    a. flush with the soffit face;

    b. integrated into the width of a single plank so as to accentuate and not interrupt the geometry and joint alignment of the planks; and

    c. coordinated with all other similarly soffit mounted loudspeaker and CCTV camera infrastructure.

4. it can be demonstrated that the mounting and photometrics of all soffit lighting does not result in veiling glare for Patrons on the Platform or produce light trespass into any adjacent existing or planned future residential land uses immediately west of either Station.

5-3.5.2.2 Twin Brooks Station Canopy: Station-Specific Features

A. Without limiting the requirements set out in Section 5-3.5.2.1 [*Canopies: General*] of this Schedule and character-defining architectural element descriptions set out in Section 5-3.1.2.2 [*Site-Specific Character-Defining Architectural Elements: Twin Brooks Station*] of this Schedule, the Design and Construction of the Twin Brooks Platform canopy must, at a minimum, incorporate the following Station-specific parameters and features:

1. Continuous and uninterrupted Platform coverage of no less than 70 percent and no greater than 75 percent of the Platform length extending, equally, north and south from the Platform midpoint and from Platform trackside edge to trackside edge.

5-3.5.2.3 Heritage Valley North Station Canopy

A. Without limiting the requirements set out in Section 5-3.1.1.6 [*Heritage Valley North Station and Utility Complex*], Section 5-3.5.3.4 [*Platform Shelters: Heritage Valley North Station*], Section 5-3.6.2 [*Heritage Valley North Station*], and character-defining architectural element descriptions set out in Section 5-3.1.2.1 [*Character-Defining Architectural Elements of the Twin Brooks and Heritage Valley North Stations*] of this Schedule, the Design and Construction of the Heritage Valley North Platform canopy must incorporate the architectural elements, geometries and extents set out in this section.

B. As a character-defining element, the Heritage Valley North Station canopy must be Designed and Constructed to incorporate the following key architectural features, materials and assemblies having:

1. Canopy structures that provide full coverage of the Platform.

2. Canopy geometries that are configured to:

    a. drain primarily toward the center of the roof

    b. have segment soffit elevations and extents that achieve:

        i. full coordination with OCS infrastructure;

        ii. all required OCS mounting clearances;

        iii. an appropriate urban scale in relationship to the adjacent and surrounding transit facilities and future TOD land uses; and

        iv. clear and largely unimpeded views through and across the Station.

3. Canopy superstructure consisting of regularly spaced canopy-supporting elements that:

a. if off Platform, in plan, form parallel-to-platform or angled colonnades along the east and west sides of the Station.

5-3.5.3 Platform Shelters

5-3.5.3.1 Platform Shelters: General

A. Without limiting the character-defining architectural elements provisions of Section 5-3.1.2 [*Character-Defining Architectural Elements: General*] of this Schedule, each Platform must include Patron waiting Shelters and SFVM Shelters meeting the requirements of this Schedule and Chapter 10 of the HFDG.

B. All Patron waiting Shelter enclosures must include radiant heating and a full-height, vertically oriented glazing system, including two door openings, each capable of accommodating and supporting in the future a matching swing door leaf with heavy-duty, barrier-free power operator hardware as required to meet the minimum project-specific Barrier-Free requirements.

C. In addition to meeting the useable floor area and other requirements of Chapter 10 of the HFDG and Chapter 1 of the ADG, each heated Patron waiting Shelter interior must accommodate a minimum of two 1700 mm diameter wheelchair turning reference circles

D. All Shelters must be rectangular in plan with the long axis centered on the Platform longitudinal centerline.

E. Each Patron waiting Shelter enclosure must be able to accommodate the potential future inclusion of swing doors that:

1. are in conformance with the Accessibility requirements of the ADG;

2. are activated through an Accessible hand swipe sensor incorporated into a free-standing bollard or stanchion mounted to the Platform and located to not interfere with door operation or impede Patron movements on the Platform;

3. can be monitored via the City CCure corporate security system;

4. default to ‘open’ in the case of a door operator malfunction; and

5. do not impede or reduce the stipulated Pedestrian Clear Width requirements of the ADG.

F. Where door openings occur, these must be able to accommodate and support at each end of a Patron Shelter, door swings that alternate such that there are an equal number of doors providing direct access to each side of the platform.

G. All glass wall panels on all Shelters must be fabricated from laminated, tempered glass.

H. All Shelter enclosures must incorporate a continuous, high contrast fritted band or glass interlayer, applied at eye-level to all transparent Shelter glazing surfaces in conformance with the requirements of Chapter I of the ADG.

I. Glass panels on Patron Shelters may incorporate decorative applications:

1. associated with the Character Zone;

2. as Public Art; and

3. complying with CPTED requirements in Section 2-4 [*Crime Prevention Through Environmental Design (CPTED)*] of this Schedule.

J. Glass panels on Patron Shelters must be:

1. full height to the underside of the Station canopy, with:

    a. vertical and horizontal, mullion-less structural silicone glass panel joints.

2. laterally supported by a substructure of hot-dipped galvanized steel.

K. Glass wall panel dimensions, joint spacing and supporting substructure geometry must be optimized to:

1. enhance the safety, comfort, and interior maneuverability within the Shelter for Patrons of all abilities;

2. produce the greatest number of identical glazing modules across all Platform Shelters;

3. enhance the ease and safety of maintenance, repair and replacement activities related to shelter glazing, furnishings, fitments, and equipment; and

4. support and enhance the overall functionality and architectural character of the Station.

L. Shelter glass wall panels are affixed to and supported by a:

1. top-mounted glass panel capture and support assembly that is:

    a. fully recessed within the Platform canopy soffit; and

    b. flush to, and matched geometrically at its bottom edge with, the surrounding soffit surface.

2. bottom-mounted glass capture and support assembly configured to:

    a. bear directly on the Platform surface;

    b. permit cross-platform drainage and ready drying of melt water from tracked-in snow or water used to clean the shelter interior;

    c. prevent the ingress of wind-driven snow or turbulent air or drafts within the Shelter;

    d. incorporate glazing panel leveling/bearing points and a continuous, tight-fitting stainless steel surround or shroud, formed as a curb;

    e. conceal the glazing panel bottom edge assembly and leveling/bearing points;

    f. match the slope of and be flush to the supporting Platform surface along its bottom edge; and

    g. have a horizontal top edge that must be set at a minimum 150 mm above the immediately adjacent longitudinal Platform surface when measured at the highest end of the Shelter.

3. a fabricated internal steel substructure for lateral/wind loads centered on the vertical and horizontal structural silicone glazing joints between end and side panels and:

    a. supporting the latch and hinge sides of the potential future Shelter doors;

    b. incorporating and integrating a steel corner guard at all outside corners of each Shelter.

4. a fabricated secondary system of horizontal structural elements, integrated with the vertical members, for supporting:

a. the glazing system horizontal joints between the upper and lower glazing bands;

b. the overhead, linear radiant heating appliances; and

c. the mounting and affixing of glass door Barrier-Free operator assemblies.

5. interior vertical and horizontal clearances that fully accommodate:

a. seating type(s) and Patron capacities as determined by the Design-Builder in conformance with the requirements of this Schedule. Refer to Table 5-3.7.1.1.a [*Platform Furnishing and Equipment: Minimum Quantities*] of this Schedule, the HFDG, and City's ADG;

b. a minimum of two reference wheelchairs 1700 mm in diameter.

6. heated, utilizing overhead, linear, gas-fired radiant appliances:

a. mounted at a minimum height of 3000 mm above the top of Platform to underside of heater assembly;

b. architecturally integrated with respect to the overall arrangement, position, materials, and finish quality of the appliance, mounting fitments, fasteners, exhaust flue, and flue penetration point at the Shelter roof;

c. shielded or shrouded as required to prevent damage to or discolouration of any of the adjacent Shelter or canopy materials, finishes or surfaces as may be caused by appliance heat or the by-products of combustion;

d. having temperature controls conforming to the requirements of the HFDG; and

e. equipped with architectural quality, insulated flue jacket assemblies that are:

i. fabricated from high-quality, corrosion-proof materials;

ii. fully coordinated and architecturally integrated with all roofing assembly penetrations, flue supports and flue-top assemblies; and

iii. not visible above the canopy roof surface when viewed from the immediately adjacent pedestrian public realm.

5-3.5.3.2 SFVM Shelters

A. All SFVMs must be protected by a Shelter with a maximum clear interior height of 2050 mm with:

1. a plan area that extends a minimum of 300 mm from the front face of each SFVM;

2. sufficient clear inside width at Shelter front to permit the SFVM cabinet door to swing open to a minimum radius of 110 degrees measured to the inside face of cabinet door;

3. glass screen walls:

a. extending from a maximum of 50 mm above top of Platform to within 50 mm, maximum, of the full interior clear height of the Shelter; and

b. at the rear and each side of the Shelter for the entire Shelter depth.

4. a glass roof, sloped or curved to shed precipitation away from the front of the Shelter that extends a maximum of 450 mm from the front face of the SFVM.

B. In addition to meeting the general requirements set out in Section 5-3.5.3.2.A of this Schedule, the Design-Builder must Design and Construct sufficient numbers of rectangular SFVM Shelters for the Twin Brooks and Heritage Valley North Platforms. Refer to Section 5-3.7.4.2 [*Smart Fare Vending Machines*] of this Schedule. The Shelters must have the following features:

1. a fabricated internal steel substructure with glass rear and side walls, and glass roof based on and matching the general architectural expression, member sizing, materials and geometries of the heated Platform Shelters. Refer to Section 5-3.5.3.1 [*Platform Shelters: General*], Section 5-3.5.3.3 [*Heated Platform Shelters: Twin Brooks Station*], and Section 5-3.5.3.4 [*Platform Shelters: Heritage Valley North Station*] of this Schedule;

2. Shelter glass wall panels are affixed to and supported by:

    a. side glass capture and support elements attached to the internal frame vertical members at:

        i. the four corners of the Shelter assembly

        ii. top and bottom lateral bracing elements

3. structural silicone corner and intermediate glass panel joint spacing, glass panel size, and Shelter substructure to:

    a. be optimized to produce the greatest number of identical glazing modules;

    b. be architecturally coordinated and aligned with the overall Platform and canopy structural module spacing and mounted to the Platform. Refer to Figure 5-3.5.1.1.a [*Typical Mounting Conditions*]; and

    c. incorporate an integral external corner guard at all outside, right-angled corners of each Shelter.

5-3.5.3.3 Heated Platform Shelters: Twin Brooks Station

A. In addition to meeting the general requirements set out in Section 5-3.5.3.1 [*Platform Shelters: General*] of this Schedule, the Design-Builder must Design and Construct three rectangular heated Platform Shelters for the Twin Brooks Platform.

5-3.5.3.4 Platform Shelters: Heritage Valley North Station

A. In addition to meeting the general requirements set out in Section 5-3.5.3.1 [*Platform Shelters: General*] of this Schedule, the Design-Builder must Design and Construct three heated Platform Shelters for the Heritage Valley North Platform.

B. Shelters must be Designed and Constructed according to the requirements set out in Section 5-3.5.3.1 [*Platform Shelters: General*] of this Schedule but with the following Station-specific characteristics and added parameters, materials, components and assemblies:

1. three Shelters must be provided;

2. one Shelter should directly adjoin the Platform service and utility building. Refer to Section 5-3.6.2 [*Heritage Valley North Station*] of this Schedule, such that:

    a. the combined building and Shelter enclosure:

        i. is located beneath and centered within the Platform longitudinal extents of the middle portion of the Platform;

ii. has its longitudinal centreline co-aligned with that of the Platform.

b. the south interior wall of the Shelter should be formed by and incorporate the north exterior wall of the Platform service and utility building. Refer to Section 5-3.6.2 [*Heritage Valley North Station*] of this Schedule;

c. the south vertical ends of the east and west walls of the Shelter must be coplanar with and joined to the east and west walls, respectively, of the service and utility building at its finished northeast and northwest exterior corners.

3. the second and third Shelters must be located approximately midway between the north and south ends of the middle Shelter and the north and south Platform ends, respectively.

4. if canopy columns are located off of the Platform, the exterior Shelter enclosures of the outboard north and south Platform Shelters must incorporate opaque wall assemblies that:

a. at the northmost Shelter, comprise two narrow, full height, dedicated vertical services shaft elements, rectangular in plan:

i. with finished exterior surfaces of fibre-reinforced architectural cladding panels that are flush to and coplanar with the adjoining and abutting Shelter glass wall assemblies;

ii. utilized to contain and conceal Station services, wet and dry, mechanical and electrical, variously and as needed, between the Platform crawl space and the Platform canopy;

iii. extending from top of Platform to a dedicated recess and horizontal perimeter reveal or penetration point set into the underside of the wood plank canopy soffit;

iv. located at the northeast corner and southwest corners of the Shelter, respectively, of the Shelter and having one with a long aspect parallel to the east Platform edge and a second with its long aspect perpendicular to the Platform edge;

v. having a finished long aspect extending approximately half the shelter length and a finished short aspect extending approximately half the Shelter width;

vi. both shaft elements must, at a minimum, have an internal clear width sufficient to accommodate the largest diameter insulated rainwater leader, and be clad and delineated to match exactly the fiber-cement panel enclosure of the Platform service and utility building. Refer to Section 5-3.6.2 [*Heritage Valley North Station*] of this Schedule; and

vii. both shaft elements must, from their respective Platform edge-facing aspects, architecturally incorporate and structurally support Platform signage and the requisite integrated cantilever arm from which they are suspended.

b. at the southmost Shelter, comprising the identical disposition of all enclosure assemblies described above in Section 5-3.5.3.4.B.3 of this Schedule but mirrored about the Platform transverse midpoint.

5-3.6 STATION SERVICE AND UTILITY ROOMS

5-3.6.1 Twin Brooks Station

A. There are no specific requirements for service and utility rooms at Twin Brooks Station.

5-3.6.2 Heritage Valley North Station

A. The Design-Builder must Design and Construct a Platform services and utilities building as part of the Heritage Valley North Station.

B. The Platform services and utilities building must incorporate the rooms and spaces identified and described below in Table 5-3.6.2.a [*Platform Services and Utilities Building*] of this Schedule and that are to be:

1. located on and be directly accessible from the Platform;

2. furnished, finished, and equipped in conformance with the requirements and descriptions for each room or space as set out in Parts 10.6, 10.7, and 10.11 of the HFDG; and

3. confirmed with the City during Design.

Table 5-3.6.2.a: Platform Services and Utilities Building

Room Name	Access	Adjacencies	Minimum Dimensions	HFDG Reference
Electrical	secure access from Platform	Network and Comms	3000 mm in one direction	10.11.1.2
Network Access / Communications	secure access from Platform	Electrical	4700 mm in one direction	10.11.1.4
Janitor and Snow Clearing	secure access from Platform	Staff W/Cs	3000 mm in one direction	10.6.6.8
Staff W/Cs (2 Washrooms)	secure access from LRV Operator flex/common area	Janitor Mech./Water Meter	As per City's ADG	10.6.6.2
LRV Operator/Staff Flex Space/Common Area	secure access from Platform	Staff W/Cs	2400 mm in one direction	N/A
Mechanical and Water Meter Room	secure access from Platform	Staff W/C	As per HFDG	10.11.1.6

C. The Platform services and utilities building must be designed and constructed to:

1. match the overall architectural character and expression of the existing Heritage Valley Transit Centre and the other Project buildings with respect to:

   a. material palette;

   b. delineation and proportions of concrete base, stack-bond brick middle and architectural prefinished metal upper segment of the building exterior.

2. extend, vertically, from below the platform to the underside of the roof deck of the single, central canopy segment that is to surmount the Platform midsection and the conjoined heated Patron Shelter and services and utilities building;

3. have a perimeter foundation, below platform level, structurally supporting:

   a. the exterior walls of the building (not the abutting shelter or the canopy above);

   b. a separate suspended floor slab; and

c. the inboard edges of the precast platform panels that flank the building through the entire length of its east and west (track-edge) sides.

4. provide an unconditioned but fully enclosed interstitial space:

   a. formed between the underside of the surmounting canopy segment and the ceiling of the building interior;

   b. for the mounting and operation of building heating and ventilation equipment; and

   c. accessible from the building interior.

5. incorporate a perimeter enclosure that:

   a. creates horizontal datums between the concrete base, brick middle and prefinished metal louver top wall assemblies that are:

      i. aligned with similar datums on the adjacent and abutting Platform Shelter; and

      ii. integrated with the mounting of Station wayfinding signage and/or VMS.

   b. architecturally integrated with and transitions elegantly to the canopy soffit above.

   c. completes and compliments a coherent, unified architectural composition of Shelter, building, canopy and surrounding/adjoining Platform.

6. integrate the door, frame, door hardware, and hose bib wall box assemblies into the exterior brick unit masonry and precast concrete base in a manner that:

   a. eliminates concealment opportunities. Refer to Section 2-4 [*Crime Prevention Through Environmental Design (CPTED)*] of this Schedule;

   b. prevents Patron injuries or mishaps related to contact with protruding components or assemblies; and

   c. results in a durable, weathertight enclosure that is highly resistant to vandalism and incidental impacts whether from Patron circulation or typical Platform Maintenance activities.

5-3.7 STATION FURNISHINGS AND EQUIPMENT

5-3.7.1 Station Furniture

5-3.7.1.1 Benches

A. Provide bench seating for each Platform, including the seating in the Shelters, meeting the requirements of this Schedule and as itemized in Table 5-3.7.1.1.a [*Station Furnishings and Equipment: Quantities and Types*] of this Schedule.

B. Locate and mount benches to the Platform outside of the heated Shelters:

   1. in two equally spaced groups of facing pairs of benches mirrored, north and south, across the Platform midpoint;

   2. with the transverse midpoint of each bench aligned with the longitudinal center of the Platform; and

   3. with the long dimension of each bench perpendicular to the Platform edge.

C. Each Platform bench must seat three persons.

D. Benches must include seat, back, end arms and arms between each seat, except that seating in Shelters need not have backs.

E. All metal elements of seating must be corrosion resistant; if coated, factory-coating application must be used.

5-3.7.1.2 Waste and Recycling Receptacles

A. Without limiting the requirements set out in Figure 10.10 of Appendix 10B in the HFDG, the Design-Builder must provide a minimum of four combined waste and recycling receptacles on each Platform.

B. Waste and recycling receptacles must:

1. be located within 20 m to 30 m of each Platform Access Point;

2. accommodate a minimum of two throughput streams: “waste” and “recyclables”;

3. allow for a minimum of 76 L of waste and 76 L of recyclables; and

4. incorporate securable, theft-resistant, removable covers over openings.

C. All metal elements of waste and recycling receptacles must be corrosion resistant; if coated, factory-coating application must be used.

5-3.7.2 Electrical and Communications Equipment

A. All Platform lighting, wayfinding and other signage and communications elements, not installed, or permitted to be installed, within the Station canopy soffit, must be installed at a constant datum above the Platform and be architecturally coordinated along the entire length of a Platform, whether pole- or column-mounted, with respect to:

1. horizontal offsets, mounting heights, angles and orientation;

2. mounting surface material, finish, colour, and supporting assembly integration;

3. equipment materials, colours, and finishes integration; and

4. performance requirements related to, at a minimum:

a. acoustics, in terms of noise, and speech intelligibility;

b. illumination, as it relates to visibility, colour and texture rendition, glare and reflectance; and

c. legibility with respect to optimal viewing angles and distances to signs and objects.

B. Systems cabinets, for marshalling of Station power, signals and communications equipment, where required, must be located within 30 m of each Platform Access Point.

C. Unless noted otherwise, all electrical and communications equipment on Platforms not visible to or accessed by Patrons must be located in Platform-mounted systems cabinets configured and arranged as follows:

1. cabinet enclosures must be Type 316L stainless steel, #4 brushed finish;

2. be fully compatible with the other Platform amenities with respect to all required Accessibility and Platform emergency egress clearances;

3. cabinets must be sized and located to minimize or eliminate inconvenience or hazards to Patrons on the Platform caused by typical Maintenance access to the cabinet interior;

4. cabinets doors, when fully open, must not extend into the Pedestrian clear width of the Platforms; and

5. the dimensions of each cabinet must not impede the Platform Pedestrian Clear Width. Access to cabinets for service and maintenance must not impede the Platform Pedestrian Clear Width.

5-3.7.3 Multi-use Poles

5-3.7.3.1 Platform Poles: General

A. Unless noted otherwise, free-standing, multi-use Platform poles must be manufactured or fabricated in conformance with the requirements of the City's Road and Walkway Lighting Design Standards and Chapters 10 and 11 of the HFDG. Refer to Section 5-3.14 [*Building Electrical*] of this Schedule.

B. Free-standing, single-use poles are not permitted within the Station unless the canopy columns are located off the Platform at Heritage Valley North Station.

C. Free-standing, Polevator Moog poles are required at both Stations to mount CCTV cameras at the platform end outside corners for viewing each platform edge.

D. Multi-use poles must be designed and manufactured or designed and fabricated to:

1. Architecturally integrate, structurally support and electrically accommodate, variously:

   a. pedestrian lighting

   b. Platform wayfinding signage

   c. VMS signs

   d. CCTV cameras

   e. City's 'Open City' WIFI antennae

   f. public address loudspeakers

   g. secure, safe and convenient access points for the installation and Maintenance of luminaires, lamps, power, data, and digital control infrastructure concealed within and fully integrated with the pole and pole armatures so that there are no exposed conduits or cables.

2. Use only proprietary manufactured or custom-fabricated poles, lamp arms and other purpose-built armatures and appurtenances for attaching and supporting the items listed in Section 5-3.7.3.1.D.1 of this Schedule and for mounting the pole to structure.

3. Never combine manufactured or fabricated poles with aftermarket components, metal banding clamps, or other miscellaneous attachment hardware.

5-3.7.3.2 Off-Platform Poles

A. All poles used along any sloped walkway, ramp or landing area connecting At-Grade Platforms to adjoining grade must, in overall Design Data, manufacture or fabrication, be identical to Platform pole Design Data elements described in Section 5-3.7.3.1 [*Platform Poles: General*] of this Schedule, and have, at a minimum, the following features and capabilities:

1. pedestrian lighting

2. CCTV cameras

3. loudspeakers

4. banner arms

5-3.7.4 Patron Interface Equipment

5-3.7.4.1 General

A. Patron Interface Equipment is any equipment with which Patrons in the Station or on the Platform interact with or view directly in order to obtain information, purchase fares or communicate directly with City personnel and can include but is not limited to:

1. SFVM

2. SFV

3. VMS

4. City's TV screens

5. corporate advertising screens

B. Locate Patron Interface Equipment so that:

1. a Patron standing at the Platform Access Point to which the Patron Interface Equipment is closest, has an unobstructed view to the Patron Interface Equipment; and

2. it does not impede Patron flow on the Platform.

C. Locate SFVMs, SFVs, City LAN Cabinets, City TV screens, and corporate advertising screens such that they are accessible for Maintenance by authorized City Personnel without disrupting operations.

D. SFVs and SFVMs must be located and mounted so as to ensure effective drainage, drying and durability of the equipment and its mountings.

E. Water draining on the Platform must not:

1. be unduly hampered by or become trapped beneath the SFV and SFVM equipment bases;

2. collect in or penetrate through the precast Platform panel via any equipment anchorage and conduit holes.

F. The Design-Builder must Design and Construct all mounting and systems infrastructure required for the supply and installation, by the City, of all Patron Interface Equipment.

G. The Design-Builder must supply cover plates and equipment base shrouds for concealing baseplates and any exposed fasteners that may be required for the Patron Interface Equipment mounting to the Platform.

5-3.7.4.2 Smart Fare Vending Machines

A. SFVMs will be supplied and installed by the City.

B. The Design-Builder must supply and install the appropriate equipment baseplates, mounted to the Platform.

C. Prior to final precast panel fabrication and again prior to final SFVM mounting, the Design Builder must confirm and coordinate with the City:

1. conduit access locations and diameters before installing;

2. conduit anchor hole diameter, spacing and depth before drilling anchor holes; and

3. anchor rod specifications before installing anchors.

D. Locate SFVMs perpendicular to the Trackway in the longitudinal center of each Platform.

E. In addition to the requirements of Section 5-3.7.4.2 [*Smart Fare Vending Machines*] of this Schedule, locate a minimum of four SFVMs on each Platform as follows:

1. two: one each within 11 m of the north and south Platform Access Points, respectively; and

2. two: one each placed symmetrically around the Platform midpoint, located approximately 20m to 40m apart from the SFVMs specified in 5-3.7.4.2.E.1.

5-3.7.4.3 Smart Fare Validators

A. Provide SFV infrastructure in accordance with Section 5-3.7.4.3 [*Validators*] of this Schedule.

B. SFVs will be supplied and installed by the City.

C. Coordinate and confirm size, location, material and other SFV mounting conditions and parameters with the City prior to installation:

1. Confirm with the City:

a. anchor hole diameter, spacing and depth before drilling anchor holes;

b. anchor rod specifications before installing anchors; and

c. conduit access location and pole diameter before installing conduit.

D. Locate a minimum of eight SFVs on each Platform at approximately equidistant spacing longitudinally along the Platform, with one SFV located within 10 m of each Platform Access Point.

E. Provide SFV pole mountings that protect and conceal from view completely all baseplate and anchor bolts or stud and nut assemblies.

Table 5-3.7.1.1.a: Platform Furnishings and Equipment: Minimum Quantities

Furnishing/Equipment	Quantities	
	Heritage Valley North	Twin Brooks
Benches	24	17
Waste/Recycling Receptacles	4 (sets)	4 (sets)
Multi-Use Poles	4	10
Smart Fare Vending Machine	4	4
Validators	4 (sets)	4 (sets)
Variable Messaging Sign	6	6
ETS TV Screen	2	2

Furnishing/Equipment	Quantities	
	Heritage Valley North	Twin Brooks
Digital Corporate Advertising Screens	2	2
Emergency Help Phone	4	4
Operator's right-of-way Phone	8	4
CCTV Cameras	by Design-Builder	by Design-Builder
Speakers	by Design-Builder	by Design-Builder
Public Information Panel	2	2

5-3.7.4.4 Variable Message Signs

A. Provide VMS in accordance with Section 5-3.7.4.4 *[Variable Message Signs]* of this Schedule.

B. Provide a minimum of three VMS on each Platform for each Track that a Platform serves, placed such that:

1. each VMS is clear as to which Track it serves;

2. the minimum spacing between VMS is not less than 30 m;

3. each VMS is mounted to the underside of a dedicated horizontal armature, perpendicular to the Tracks;

4. each VMS is double-sided; and

5. a minimum of one VMS is legible from anywhere on the Platform.

5-3.7.4.5 City TV Screens

A. Provide systems infrastructure for City TV screens. City TV screens and City screen enclosures will be supplied and installed by the City.

B. Locate systems infrastructure for:

1. two pairs of back-to-back City TV screens, for a total of four City TV screens, on each center-loading Platform, such that each pair must be located at the longitudinal center of the Platform.

C. City TV screens must be:

1. spaced at no less than 25 m and no more than 45 m between each pair of City TV screens on each Platform; and

2. mounted to the Platform parallel to the Tracks and below the canopies within City TV screen enclosures.

D. Provide two connection points at each City TV screen location suitable for the attachment of City TV screens and City TV screen enclosures. The connection points must be readily accessible to facilitate the future installation of City TV screens and City TV screen enclosures by the City without having to modify the Platform structure by methods such as welding, coring, and drilling.

E. The Platform structure must be Designed and Constructed to support all loads from the City TV screens, including the City TV screen enclosures and the wind loads on the screens, assuming the following for each City TV screen:

1. dimensions of the City TV screen are to be confirmed by the City during detailed design.

5-3.7.4.6 Corporate Advertising Screens

A. Provide systems infrastructure for corporate advertising screens in accordance with Section 5-3.7.4.6 [*Corporate Advertising Screens*] of this Schedule. Corporate advertising screens will be supplied and installed by the City.

B. Confirm with the City:

1. anchor hole diameter, spacing and depth before drilling anchor holes;

2. anchor rod specifications before installation anchors;

3. conduit access location and diameter before installing conduit; and

4. dimensions, weight, and specifications of screen.

C. Corporate advertising screens must be:

1. located within 20 m of each Platform Access Point for all Platforms such that:

a. each Platform must have a minimum of two sets of back-to-back corporate advertising screens.

2. positioned:

a. at the longitudinal center of the Platform;

b. parallel to the tracks; and

c. within 15 m of the circulation elements but not impeding desired pedestrian flows.

D. The overall dimensions, weight and other important physical characteristics of the corporate advertising screens are to be confirmed with the City.

E. Corporate advertising screens on Platforms must be mounted to the Platform and protected by the Station canopies and not mounted to or suspended from the canopies.

5-3.7.4.7 Right-of-Way Operator Phones

A. Right-of-way Operator phones must be provided at the following locations:

1. at each end of each Platform; and

2. within the electrical room, communications room, and in LRV Operator Flex Space of the Platform services and utilities building at Heritage Valley North Station.

B. Final locations must be coordinated with the City during Design.

5-3.8 STATION SIGNAGE

5-3.8.1 Station Signage: General

A. This Section 5-3.8.1 [*Station Signage: General*] of this Schedule sets out general parameters and requirements for signage at all Stations. Signage and wayfinding must contribute to a positive customer service experience for all persons in addition to notifying persons of regulations.

B. The general design, content, size, colour, typography, mounting heights and optimal viewing angles and distances for each type of sign described in this Section 5-3.8 [*Station Signage*] of this Schedule must comply with the Graphic Standards Manual, and Part A.6 of the City's ADG.

   1. ETS pictograms to be in conformance with 22-02-09 COE Pictograms LRT r01.

C. Signage Design Data package must be submitted to the City for review and approval prior to production of signage.

D. The use of free-standing poles for the sole purpose of mounted signage is not permitted on the Twin Brooks Platform.

E. For the purpose of this Section 5-3.8 [*Station Signage*] of this Schedule, the following Station names must be used for all signage.

   1. Twin Brooks

   2. Heritage Valley North

5-3.8.2 Wayfinding

A. Sufficient and clear wayfinding signage must be provided at all Stations in accordance with the ETS Graphic Standards Manual (available as Disclosed Data) and the ADG.

5-3.8.3 Station Identification Sign

A. The purpose of a Station identification sign is to notify Passengers on the LRV which Station they are arriving at, therefore the signage must be visible by Passengers from approaching LRVs as they enter the Station.

B. Immediately below each Station identification sign must be an "LRT System Map" which identifies all the Stations and LRT Lines and highlights the Station on which it is placed:

   1. Provide written notice to the City at least 90 days before issuing the Final Design Data package for Station identification signs. The City will provide the content for Station identification signs within 30 days of receiving the written notice.

C. Notwithstanding the information in Appendix 1 of the ETS Graphic Standards Manual (available as Disclosed Data), the "No Smoking" and "No Trespassing" pictograms must:

   1. not be integrated with the Station identification sign; and

   2. be placed separately within 2 m of each Station identification sign.

D. A minimum of six Station identification signs, three per side, must be provided at each Station:

   1. located at the outer trackside edge;

   2. such that the distance between the Station identification sign and the end of the Platform must not exceed 30 m;

3. be parallel to the direction of LRV travel;

4. be double-sided, except when not facing immediately adjacent publicly accessible space, and

5. reflected to align with the direction of LRV travel.

E. Station identification signage located along the west side of the SB Trackway through Twin Brooks Station and through Heritage Valley North Station on the east side of the NB Trackway and west side of the SB Trackway must be dual sided so that it is identifiable by pedestrians adjacent to Station, Patrons on the Platform, and Passengers in the LRVs.

5-3.8.4 Directional Wayfinding Sign

A. The purpose of the directional wayfinding sign is to easily direct alighting Passengers off the Platform in the direction they intend to go.

B. Directional wayfinding signs must be LED backlit such that they are viewable from the minimum distance requirements specified in the Graphic Standards Manual during non-daylight hours.

C. The primary information included on a directional wayfinding sign must be as per the requirements of the Graphic Standards Manual.

D. The Design-Builder must provide written notice to the City at least 90 days before issuing the Final Design Data package for directional wayfinding signs.

E. The City will provide the content for directional wayfinding signs within 30 days of receiving the written notice.

F. The Design Builder must provide a minimum of eight directional wayfinding signs on each Platform that must:

1. be double-sided;

2. be perpendicular to the direction of LRV travel; and

3. be spaced such that the space between them is not less than 20 m and the distance between the last directional wayfinding sign and the end of the Platform must not exceed 15 m.

G. The first directional wayfinding sign facing persons entering the Platform at either end of the Twin Brooks Station and Heritage Valley North Stations must contain one “To Trains” pictogram as well as the following text:

1. “Proof of Payment Required Upon Entering Trains”

2. “City of Edmonton Bylaw Fine for Violation”

5-3.8.5 Regulatory

A. The Design-Builder must Design and Construct all regulatory signage in conformance with the requirements of the Graphic Standards Manual.

5-3.8.6 Security Camera Signs

A. The purpose of the security camera sign is to notify the public that CCTV cameras may be operating along the LRT Corridor, including at the Stations.

B. Provide one security camera sign at every Platform Access Point for both Stations and at every entrance to the Stations.

5-3.8.7 Information

A. The Design-Builder must Design and Construct all information signage in conformance with the requirements of the Graphic Standards Manual.

5-3.8.8 Accessibility

A. The Design-Builder must Design and Construct all information signage in conformance with the requirements of the Graphic Standards Manual.

5-3.8.8.1 Automatic Door Signs

A. The purpose of the automatic door sign is to identify to the public which doors are automatic.

B. Provide a minimum of one automatic door sign at every automatic door indicating that it is an automatic door.

5-3.8.9 Safety

5-3.8.9.1 Emergency Phone Sign

A. Provide emergency phone signs indicating the location of each emergency telephone.

B. The number and placement of the emergency phone signs must ensure that a minimum of one sign is visible from all points on the applicable Platform.

5-3.8.9.2 Security Camera Identification Sign

A. The purpose of the security camera identification sign is to allow security personnel and Patrons on the Platform who may be in danger or are in distress to identify their exact location at or within a Station when communicating with security personnel.

B. Provide one security camera identification sign for every CCTV camera installed as part of the Project, displaying the identification reference of the applicable camera.

C. The security camera identification sign may be affixed to but must not be suspended from the Station canopy soffit and must be legible from both sides.

D. The security camera identification sign must be located not more than 250 mm from the camera.

Table 5-3.8: Station Signage

Signage	Quantities	
	Heritage Valley North	Twin Brooks
Station Identification Sign	6	6
Wayfinding Sign	8	8
Regulatory Signage	by Design-Builder	by Design-Builder
Information Signage	by Design-Builder	by Design-Builder
Safety Signage	by Design-Builder	by Design-Builder
Clock Tower	0	1

1. All quantities shown are minimum and locations to be confirmed by Design-Builder and presented to the City for approval during design.

2. Refer to Chapters 8, 10, and 14 of the HFDG and the ETS Graphic Standards Manual (available as Disclosed Data) for signage requirements.

5-3.8.10 Clock Tower

A. One Clock Tower must be Designed and Constructed at Twin Brooks Station conforming to the requirements of the HFDG but with Design modifications that:

1. directly address the character and scale of the adjoining Station and its immediate urban context;

2. minimize impacts on nearby residential land uses with respect to visual clutter and light trespass; and

3. permit the clock face and ETS logo to be viewed easily from the main pedestrian approaches to the Station.

B. Design Data modifications include but are not limited to:

1. pylon base dimensions and mountings;

2. pylon height;

3. pylon width;

4. pylon and signage elevation geometry; and

5. lighting photometrics for pylon, signage, and digital display.

C. Locate the Clock Tower pylon:

1. centered on and immediately east of the south sloped walkway bottom landing;

2. with the long dimension parallel to the Trackway; and

3. to be fully coordinated with and free and clear of all buried Utilities and nearby vertical infrastructure including wayside equipment and OCS clearance envelopes.

D. Supply power, data, and electrical grounding to the Clock Tower and all of its lighting and digital display elements with embedded and concealed conduit and grounding bonding points throughout, including from below-grade and through the pylon base.

E. Tie all data and communications related to clock function to the City master clock.

5-3.9 STAND-ALONE UTILITY COMPLEXES AND TPSS

A. Unless noted otherwise, the Design and Construction of all UCs and the Anthony Henday TPSS should be in conformance with the requirements of the character-defining architectural element sections of this Schedule, the HFDG, and the following modifications to or adaptations of Project Requirements described in Section 5-3.9.1.1 [*Twin Brooks UC*], Section 5-3.9.1.2 [*Anthony Henday TPSS*], Section 5-3.9.1.3 [*Llew Lawrence OMF UC*], and Section 5-5.9.1.4 [*Heritage Valley North UC*] of this Schedule, relative to:

1. Site context descriptions and SUI requirements set out in Section 5-3.1.1.2 [*Twin Brooks Utility Complex*], Section 5-3.1.1.4 [*Anthony Henday TPSS*], Section 5-3.1.1.5 [*Llew Lawrence OMF UC*], and 5-3.1.1.6 [*Heritage Valley North Station and Utility Complex*] of this Schedule.

2. Site-specific functional program and room adjacencies as set out in Table 5-3.9 [*Utility Complex and TPSS: Site-Specific Functional Program*] of this Section.

Table 5-3.9: Utility Complex and TPSS: Site-Specific Functional Program

Room Name	Access	Adjacencies	Building Requirements			
			Twin Brooks	Heritage Valley North	Anthony Henday	Llew Lawrence OMF
Traction Power	single doors (two) to exterior overhead door (one) to exterior: W: 3600 mm H: 3000 mm	Comms. Signals	Room Included Oriented on south towards Twin Brooks Station	Room Included Oriented on north end of building to minimize noise to pedestrian pathway at 135 Street Kiss and Ride	Room Included	Room Included Accommodate two transformer sets and two High Voltage lines.
Outside Services	single door to exterior	N/A	Room Included	Room Included	Room Not Included	Room Included
Electrical	double door to exterior inside - double	On the side of the service transformer	Room Included	Room Included	Room Not Included	Room Included
Fire Suppression Tank Storage	inside - double	N/A	Room Included	Room Included	Room Not Included	Room Included
Communications	inside - double	TPSS Signals UPS	Room Included	Room Included	Room Not Included	Room Included
Signals	inside - double	Comms TPSS	Room Included	Room Included	Room Not Included	Room Not Included
UPS	inside - double	Comms	Room Included	Room Included	Room Not Included	Room Not Included
Mechanical	inside - double	N/A	Room Included	Room Included	Room Not Included	Room Included

3. All room sizes and UC layouts to be confirmed by the Design-Builder.
4. All swing doors, interior and exterior, to be confirmed by the Design-Builder.
    a. Single: 900 mm W x 2150 mm H
    b. Double: 1800 mm W x 2150 mm H
5. Refer to HFDG for specific room requirements and sizing.

5-3.9.1.1 Twin Brooks UC

A. Refer to site-specific functional program and room adjacencies as set out in Table 5-3.9 [*Utility Complex and TPSS: Site-Specific Functional Program*] of this Section.

B. Without limiting the Project Requirements set out in this and other Schedules, the Design-Builder should incorporate the following adaptations of the character-defining architectural elements to the site-specific building program and site parameters referenced in Section 5-3.9.A.1 of this Schedule with respect to:

1. building-integrated and adjoining stand-alone, or structurally abutting and adjoined, retaining wall, soil, and stormwater structures and facilities as needed to:

    a. achieve the required management or prevention of:

        i. soil creep or subsidence;

        ii. subsurface hydrostatic forces;

        iii. overland flows of storm water or meltwater; and

        iv. slope, height and proximity of grade immediately adjacent to any UC walls and within 3 vertical meters of the lowest point above adjacent grade of UC roof assemblies.

    b. prevent unauthorized access onto the UC roof;

    c. assure and maintain positive drainage away from the building exterior;

    d. provide an attractive, durable, and architecturally coherent and integrated ensemble of:

        i. building and soil retention structures with respect to scale, materials, and finishes; and

        ii. all guard rail or other visual screening or access barrier elements needed to protect building and retaining wall edges from unauthorized access or exposure to fall risks whether from directly above or via climbing from below.

2. building base, intermediate and clerestory material and assembly arrangements and extents, fixation and structural support at the east, north and south building elevations optimized as needed for:

    a. durability and vandal resistance whether through graffiti or other forms of applied physical force;

    b. drainage, deflection and drying; and

    c. unauthorized access to the building interior via, or willful damage to, clerestory glazing assemblies.

5-3.9.1.2 Anthony Henday TPSS

A. Refer to site-specific functional program and room adjacencies as set out in Table 5-3.9 [*Utility Complex and TPSS: Site-Specific Functional Program*] of this Section.

B. Without limiting the Project Requirements set out in this and other Schedules, the Design-Builder should incorporate the following adaptations of the character-defining architectural elements to the site-specific building program and site parameters referenced in Section 5-3.9.A.1 of this Schedule with respect to:

1. all items included in Section 5-3.9 [*Stand-Alone Utility Complexes and TPSS*] of this Schedule plus the following:

a. roof storm and melt water drainage that meets the requirements and intent of Section 5-3.1.2.4.D.4 of this Schedule by providing:

   i.) rooftop and rainwater leader system heat trace capacities and extents as needed to prevent, completely, the accumulation of free-standing water on the roof due to ice formation or snow accumulations at any point in the roofing and roof drainage system. Refer to Section 5-3.14.9 [*Electrical Heat Trace Systems*].

b. mono-pitch roof slope orientation such that the high point or uppermost roof edge occurs at the south elevation of the TPSS and the low point and external drainage elements at the north elevation.

5-3.9.1.3 Llew Lawrence OMF UC

A. Refer to site-specific functional program and room adjacencies as set out in Table 5-3.9 [*Utility Complex and TPSS: Site-Specific Functional Program*] of this Section

5-3.9.1.4 Heritage Valley North UC

A. Refer to site-specific functional program and room adjacencies as set out in Table 5-3.9 [*Utility Complex and TPSS: Site-Specific Functional Program*] of this Section

B. Without limiting the Project Requirements set out in this and other Schedules, the Design-Builder should incorporate the following adaptations of the character-defining architectural elements to the site-specific building program and site parameters referenced in Section 5-3.9.A.1 of this Schedule with respect to:

   1. an integrated raised planter and adjoining pedestrian plaza located at the south end of the UC.

5-3.10 BUILDING STRUCTURAL

5-3.10.1 General

A. This Section 5-3.10 [*Building Structural*] sets out the Structural Design and Construction requirements for Building Structures.

B. The Design-Builder must Design and Construct the Building Structures in accordance with Chapter 9 and 10 of the HFDG regarding general requirements and to Part 4 [*Transportation Structures and Building Structures*] of this Schedule for structural Design and Construction requirements.

5-3.10.2 Reference Documents

A. Without limiting Section 5-1.2 *[Reference Documents]* of this Schedule and Section 4-2 [*Reference Documents*] of this Schedule, and except as otherwise specified herein, Building Structures must comply with the NBCAE.

5-3.10.3 Geotechnical Considerations

A. Foundation Design must be undertaken in conjunction with Section 1-3.4.1 [*Geotechnical and Environmental*] of this Schedule.

B. The City has undertaken limited geotechnical investigations used for the preparation of this document as noted below. The results of these investigations are available in the Disclosed Data.

   1. **Twin Brooks Station:** Geotechnical Investigation – Twin Brooks Station dated January 2023

2. **Heritage Valley North Station:** Geotechnical Investigation – Heritage Valley North Station dated January 2023

3. **Utility Complexes and TPSS:** Geotechnical Investigation – Utility Complexes dated January 2023

5-3.10.4 Design Guidance/Requirements

A. Design Guidance/Requirements for Building structures will be as per Section 4-3 [*Design Guidance/Requirements*] of this Schedule and as specified herein.

B. Any element of the Building structure that serves as structural component supporting the Trackway will be considered to be a Transportation Structure and must be designed as per Part 4 [*Transportation Structures and Building Structures]* of this Schedule.

C. Any element of the Building structure that serves as structural component supporting the Trackway will be considered to be a Transportation Structure and must utilize Materials as per Section 4-3.5 [*Materials*] of this Schedule.

5-3.10.4.1 Design Loads

A. Design Loads for Building structures will be as per Section 4-3 [*Design Guidance/Requirements*] of this Schedule and as specified herein.

B. Environmental loads as per NBCAE as applicable.

C. Due to the specific roof layouts, loads due to snow accumulation, rain ponding and wind must be clearly presented on the Design Data. Specific load studies must be undertaken as required.

D. Structural elements must be designed for fall-protection system loading as specified in Section 5-3.5.2.1 B.6 of this Schedule.

5-3.10.5 Construction Specifications for Building Structures

A. Construction Specifications for Building structures must be as per Section 4-4 [*Construction Specifications*] of this Schedule and as specified herein.

B. Any element of the Building structure that serves as structural component supporting the LRT Trackway will be considered to be a Transportation Structure and must utilize Specifications as per Section 4-4 [*Construction Specifications*] of this Schedule.

C. Finishes for all Building structures including elements considered to be Transportation Structures must have exterior finishes as per architectural requirements specified in Section 5-3.12 [*Acceptable Materials and Finishes*] of this Schedule.

D. All exposed structural steel components of the Building structures must receive AESS finish as per Section 5-3.12.1.2 [*Architecturally Exposed Structural and Miscellaneous Steel*] of this Schedule. All exposed welds must be continuous and ground smooth.

E. Structural steel finishing requirements:

1. Utility Complexes or TPSS buildings:

    a. where fully concealed from view, structural steel should be prime painted only.

    b. where exposed to view on the building interior, structural steel must be painted with a wet-applied, high-performance primer and top-coat system.

2. Twin Brooks and Heritage Valley North Station including the utility building:

    a. All structural steel must be hot-dipped galvanized.

F. Structural steel elements must be constructed in a manner to prevent and avoid moisture collection.

G. Precast Platform concrete panels/slabs must be HPC concrete as per Table 4-3.5.1-1 [*Concrete Classes*] of this Schedule, and in accordance with Section 5-3.5.1.1.D of this Schedule and Section 5-3.12.1.1 [*Precast Concrete*] of this Schedule.

H. Precast panel joints must be constructed in a manner to prevent water ingress.

5-3.11 MATERIALS: GENERAL

A. Unless specifically indicated otherwise within the Schedule, the selection of all materials, and the Design and Construction of all components and assemblies for the buildings included as part of the Project must comply with the requirements of the HFDG and the Edmonton Facility Consultant Manual Volumes 1 and 2.

5-3.11.1.1 Durability

A. Without limiting the requirements of the HFDG and the Edmonton Facility Consultant Manual Volumes 1 and 2, the Design-Builder must Design and Construct the Project facilities utilizing materials that have been selected in careful consideration of the definitions of the following terms as set out within Parts 2 through 7 of the CSA S478 *Guideline on Durability in Buildings* reference standards:

1. design life
2. durability
3. envelope
4. predicted service life
5. service life

5-3.11.1.2 Building Envelope

A. Without limiting the requirements of the NBCAE, NECB and the HFDG, the Design and Construction of all building envelope assemblies for all Stations, UCs and TPSS must be in accordance with the Edmonton Facility Consultant Manual Volume 2; including but not limited to the Design and Construction of:

1. all opaque, above and below ground assemblies that separate external and internal environments;
2. all weather-resistant cladding, insulation, moisture retarding and airtight components; and
3. all joints, junctions and transitions between products, assemblies and components.

5-3.12 ACCEPTABLE MATERIALS AND FINISHES

5-3.12.1 Architectural Concrete

A. Architectural Concrete means all exposed to public view concrete surfaces of Building Structures including but not limited to:

1. flat and vertical work;

2. cast-in-place and precast elements including but not limited to:

    a. cast-in-place Platform grade beams; and

    b. cast-in-place or precast Station-area curb, upstand beam, barrier wall, light pole and Trackway equipment mast bases.

B. Architectural Concrete must comply with ACI 303R Guide to Cast-in-Place Architectural Concrete Practice.

C. Architectural Concrete must at a minimum:

1. have dense concrete finishes, free of defects such as deep or extreme honeycombing, inconsistencies in plane, cold joint lines and loss of fines;

2. use stainless steel reinforcing as appropriate in concrete structures erected in the Splash Zone;

3. be uniform in colour;

4. exhibit sharp, accurate definition at corners, generally free of chipped or spalled areas;

5. have plane surfaces without protuberances, indentations, ridges or bulges; and

6. comply with the tolerances specified in ACI 347 Guide for Formwork of Concrete:

    a. use Class A for surfaces within 3.6 m of pedestrians;

    b. use Class B for surfaces between 3.6 m and 6.0 m of pedestrians; and

    c. use Class C for finishes more than 6.0 m away from pedestrians, and for rough or textured formwork or surface treatments at any height.

5-3.12.1.1 Precast Concrete

A. Precast concrete means precast concrete fabricated as Platform panels or as precast architectural wall base elements at UC, TPSS and Platform utility buildings.

B. Without limiting the requirements set out in Section 5-3.5.1.1.D of this Schedule, architectural precast concrete utilized for Platform panels must also, at a minimum, be fabricated:

1. in accordance with the following standards:

    a. CSA A23.1

    b. CSA A23.2

2. with:

    a. HPC;

    b. reinforcing fabricated from austenitic stainless steel alloys comparable in corrosion resistance to Type 316LN stainless steel as determined by the evaluation criteria of ASTM A955; and

    c. upper (top or walking) and side surfaces cast as formed surfaces.

3. fabrication and erection tolerances in accordance with Clause 12 of CSA A23.4, plus:

a. the top surface of adjacent installed platform panels must be flush within a tolerance of 3 mm;

b. the maximum deviation from the centreline of an installed platform panel to the centreline as shown on the Construction documents must be 5 mm;

c. the maximum deviation from the alignment of the track side edge of the Platform panel shown in the Construction documents must be 3 mm.

5-3.12.1.2 AESS and Miscellaneous Steel

A. AESS means all exposed to public view steel finishes of Building Structures and exposed to view steel finishes for Transportation and other Structures located up to six metres from any area designated for pedestrian access including but not limited to:

1. Station canopy supporting elements and superstructure;

2. Platform Shelters;

3. lighting poles;

4. column-mounted Platform signage cantilever arms; and

5. Clock Tower superstructure.

B. Miscellaneous steel means all exposed to public view steel used in the manufacture or fabrication of components and assemblies including but not limited to:

1. decorative architectural metal guard and railing systems;

2. Platform Shelter and Station canopy roof monitor and clerestory glass support systems;

3. Platform and Station-area Wayside equipment enclosures;

4. formed-metal structural member shrouds;

5. building envelope closure or transition elements formed:

a. as reveals, channels, bullnose and bezel profiles;

b. as roof fascia, opaque spandrel or transom fenestration and architectural through-wall louver elements.

C. From pre-finished sheet or coils complete with premium quality, factory-applied, dry thermoplastic or thermoset coating systems.

D. AESS shall comply with the Canadian Institute of Steel Construction Code of Standard Practice for Structural Steel, Appendix I:

1. All exposed to public view steel finishes in Building Structures located up to 6 metres from any area designated for pedestrian access must be considered “feature” or “showcase” elements (CISC Category 3 or higher).

E. All AESS and miscellaneous steel must be either hot-dipped galvanized or Type 316L stainless.

F. All non-stainless AESS and miscellaneous steel assemblies (other than pre-finished sheet steel) must be fabricated from:

1. hot-dipped galvanized members that:

a. are galvanized after fabrication but before erection

b. are erected without field welding

G. Prepare hot-dipped galvanized AESS and miscellaneous steel surfaces receiving a duplex finish in accordance with the latest SSPC surface preparation standards and in accordance with ASTM D6386 and ASTM D7803 and apply only high-performance wet-applied or powder coatings specifically formulated for application over a hot-dipped galvanized finish.

H. At Stations, bolted connection joints for AESS must occur at concealed locations.

I. Where the Design data or architectural concept is based on or requires an unconcealed connection:

2. use architectural connections, such as acorn headed bolts and nuts, of consistent size and shape covering bolt threads completely; and

3. align exposed nut and bolt heads, turned to the same position within the actual connection and aligned across groups of connections.

J. Stainless AESS and miscellaneous steel must comply with the International Molybdenum Association and the Nickel Institute requirements for specifying, selecting and fabricating austenitic stainless steel sheet, bar or castings meeting ASTM material standards

5-3.12.1.3 Aluminum

A. Aluminum includes all exposed to public view aluminum architectural building envelope elements incorporated as manufactured or custom-fabricated components and assemblies including but not limited to:

1. Stick-built or unitized curtainwall glazing and fenestration systems, complete with:

a. brake-formed sheet closure, flashing, and transition elements;

b. hollow extrusion frame, back-body, and mullion components; and

c. anodized or premium quality dry thermoplastic or thermoset finishes.

2. As Aluminum Composite Material fabrications utilized at:

a. Platform canopy and UC/TPSS roof edge feature elements.

3. As building envelope closure or transition elements formed:

a. as reveals, channels, bullnose and bezel profiles;

b. as roof fascia, opaque spandrel or transom fenestration and architectural through-wall louver elements.

4. From pre-finished sheet or coils complete with premium quality, factory-applied, dry thermoplastic or thermoset coating systems.

5-3.12.1.4 Wood

A. Wood includes all exposed to public view wood incorporated as site-built or custom-fabricated:

1. Platform canopy soffit assemblies

2. UC and TPSS interior ceiling and exterior roof soffit assemblies

B. All wood used for assemblies must be solid, not manufactured as a composite or as plywood, or in any other form and must, at a minimum, be of:

1. Select Grade;

2. softwood and hardwood species, of North American origin; and

3. finished with a high-performance, transparent clear or pigmented penetrating sealer.

5-3.12.1.5 Glass

A. Glass includes all glass exposed to public view and incorporated into manufactured or custom-fabricated:

1. building and Platform Shelter fenestration systems as:

a. clear, low-iron float glass plate that is heat-strengthened, tempered or laminated, singly or in combination, for incorporation into:

i. edge and point-supported glazing systems;

ii. single- and double-pane high-performance insulated glazing units as part of an insulated building envelope.

5-3.12.1.6 Fibre-Reinforced Concrete Architectural Panels

A. Fibre-reinforced architectural panels are premium-quality, fibre-reinforced architectural panel products for the cladding of vertical services chase elements at the central heated Platform shelter at Heritage Valley North Station.

1. Metallic fibres are not permitted as per Part 4 [*Transportation Structures and Building Structures*].

5-3.12.1.7 Roofing Systems

A. Roofing systems are those systems based on high-quality membrane materials used in two types of fully adhered roofing assemblies:

1. fully adhered thermoplastic polyolefin single-membrane roofing system for insulated and non-insulated low-slope roof elements that is:

a. not mechanically fastened

b. not PVC

2. 2-ply SBS roofing system for insulated and non-insulated low-slope roof elements.

5-3.12.1.8 Brick Unit Masonry

A. Brick unit masonry includes those masonry units made from clay brick utilized on the exterior of the UCs, TPSS, and the Heritage Valley North Platform services and utilities building.

B. Brick units must be:

1. burnt clay

2. minimum Grade A

5-3.12.2 Graffiti and Stain Resistant Coatings

A. Graffiti and stain resistant coatings must be applied to all exposed to Public View surfaces to a minimum height of 3.0 m above finished floor, and:

1. for surfaces having cladding, the coating must be applied to the nearest horizontal cladding joint above 3.0 m above finished floor;

2. not be applied to glass surfaces, including curtainwalls, windows, or aluminum entrance systems; and

3. the application of graffiti and stain resistant coatings must not alter the colour or other physical properties of the surface to which it is applied such that it creates a visually apparent line between surfaces which have been treated and those which have been left untreated.

B. Joint/concealment management at building envelope material transitions are to be carefully considered to minimize potential stashing of illicit products and vandalism.

5-3.12.3 Bird Deterrent and Anti-Roosting Devices

A. Provide materials which discourage birds from setting, roosting, or nesting, and prevent damage to Structures from droppings and nesting materials.

B. Minimize potential bird roosting areas and surfaces.

C. Where preventing birds from setting, roosting or nesting by Design is not feasible, provide bird control devices which:

1. are integrated into the overall Design of the element and the surroundings;

2. do not have spikes or fabric netting;

3. permit removal and reinstallation without damage to the installation surface, bird control device or mounting system;

4. have mounting hardware, including clips and brackets, concealed from public view; and

5. prevent frost and snow accumulation.

5-3.12.4 Roofing Appurtenances

A. Roofs, including eavestroughs and downspouts, must be designed to prevent snow and ice falling onto areas below, which are accessible to persons or vehicles.

B. Where snow guards are required, roofing systems must include snow guard systems which are:

1. fully integrated within the permanent roof structure and the overall Design of the roof; and

2. approved by the roof system manufacturer.

C. Stack jack flashings must protect all sleeved penetrations through roofing systems.

D. Fall arrest/protection systems and roof assemblies are required at Stations, UCs, and TPSS and must be Designed and Constructed to:

1. meet the requirements of Alberta Occupational Health and Safety Code;

2. utilize only non-proprietary Maintenance and replacement components; and

3. be integrated with the permanent roof structure and building architecture.

E. UC, TPSS, and Station canopy roof lighting and surge protection systems and materials must be designed and constructed to be fully integrated and coordinated:

1. architecturally, with respect to:

a. the locations, materials, and types of strike termination devices;

b. electrolytic compatibility, or appropriate separation and isolation, of dissimilar metals of all system fitments and building substrates;

c. concealment and protection of all cable conductors; and

d. roof and roofing system penetrations required for connections to structural steel framework.

2. structurally, so that:

a. structural elements and Design features are used to:

i. eliminate down conductors on building exteriors;

ii. minimize air strike termination devices at roof edges; and

iii. conceal all conductors from view where visible from adjacent public spaces.

3. with building construction materials to assure:

a. galvanic and electrolytic compatibility; and

b. appropriate isolation from or between dissimilar metals.

5-3.12.5 Manufacturer Warranty

A. Provide a 15 year security for extended warranty, as follows:

a. If roofing system has been constructed by a member of ARCA, provide an ARCA 15 year Warranty Certificate.

b. If roofing system has been constructed by a non-member of ARCA, provide a maintenance bond for the performance in the amount of 100% of the cost of materials and labour associated with the roofing and roof-related work performed under the Agreement.

5-3.13 BUILDING MECHANICAL

5-3.13.1 General

A. This Section 5-3.13 [*Building Mechanical*] sets out the mechanical Design and Construction requirements for Stations, UCs and TPSS. Refer to Section 12.2 of the HFDG regarding general requirements.

5-3.13.2 Site Utilities

A. Refer to Section 12.3 of the HFDG for site Utilities requirements.

5-3.13.3 Plumbing and Piping Systems

5-3.13.3.1 General

A. Refer to Section 12.4 of the HFDG for plumbing requirements. Piping identification colours found in the HFDG must supersede the ANSI A13.1 requirements found in the Edmonton Facility Consultant Manual Volumes 1 and 2.

B. The crawl space must include drains to collect ingression water. Floor drains must be included in each fire compartment.

C. One tamper-proof water hose bib must be provided on each Platform, with the location based on Section 10.6.6.9 of the HFDG and integration into architecture.

D. No floor drains are required in the UCs and TPSS.

E. Contrary to 12.4.1 of the HFDG, the Network Access / Communications Room at the Heritage Valley Station will not require a floor drain with backflow prevention.

F. Contrary to 12.4.8.8 of the HFDG, the Network Access / Communications Room at the Heritage Valley North Station will not require an emergency eyewash station, as no batteries will be installed in the room.

5-3.13.3.2 Plumbing Fixtures

A. Refer to Section 4.12.4 of the Edmonton Facility Consultant Manual Volume 2 for a list of preferred plumbing fixtures. The fixture flow rates of the Edmonton Facility Consultant Manual Volume 2 must be followed.

5-3.13.3.3 Water Service

A. A four-season water service is required at Twin Brooks Station. The water meter at Twin Brooks Station must be located in a heated enclosure recessed in platform.

B. The water meter at Heritage Valley North Station must be located within the heated mechanical room on Platform

5-3.13.3.4 Storm Systems

A. The stormwater systems for both Stations must include provision for an overflow roof drain system consisting of roof drains and overflow drains, with separate piping systems.

5-3.13.3.5 Radon Mitigation

A. For the UCs and TPSS, a Radon mitigation plan must be incorporated into the Design. Refer to Section 4.13.3 in the Edmonton Facility Consultant Manual Volume 2.

B. A Radon mitigation plan is not required for Stations.

5-3.13.4 Vacuum Systems

A. Contrary to 12.5 of the HFDG, vacuum service rooms or systems are not required in the Twin Brooks Station and the Heritage Valley North Station.

5-3.13.5 Heating, Ventilation and Air Conditioning Systems

5-3.13.5.1 General

A. Indoor Design temperature ranges and indoor relative humidity in all rooms and spaces within the Stations, UCs and TPSS must comply with the more stringent requirements of either HFDG Section 12.6 – “Heating, Ventilation, and Air Conditioning Systems” or the Edmonton Facility Consultant Manual Volumes 1 and 2, The Design should meet any temperature and humidity requirements set by the manufacturers of equipment situated in such rooms or spaces.

B. Outdoor ambient conditions for use in Design calculations must meet or exceed the temperatures listed in the HFDG Section 12.6 – “Heating, Ventilation, and Air Conditioning Systems”.

C. Outdoor air ventilation rates must meet or exceed the higher requirements of ASHRAE 62.1 2001 (per NBCAE) and ASHRAE 62.1 [216].

D. Contrary to 12.6 of the HFDG, humidification equipment is not required in the UCs and TPSS.

E. Contrary to 12.6.2.2 of the HFDG, humidification equipment is not required in the Network Access / Communications Room at Heritage Valley North Station.

5-3.13.5.2 Shelters

A. Shelters must have indirect natural gas fired heating units. Heating unit flue termination and discharge must be above the platform canopy.

5-3.13.5.3 Crawl Spaces

A. The crawl space below the Platform must include ventilation and provide fire dampers as required for each fire compartment.

5-3.13.5.4 Twin Brooks Station

A. For heating requirements, refer to the HFDG Section 12.6 – “Heating, Ventilation, and Air Conditioning Systems”.

5-3.13.5.5 Heritage Valley North Station

A. For heating requirements, refer to the HFDG Section 12.6 – “Heating, Ventilation, and Air Conditioning Systems”. Outdoor condensing units serving the Electrical and the Network room must be designed/equipped to operate in the winter Design ambient temperature.

5-3.13.6 Building Management System

A. The Building Management System Design must meet both HFDG and the Edmonton Facility Consultant Manual Volumes 1 and 2.

5-3.13.7 Fire Protection System

5-3.13.7.1 General Fire Protection Design Requirements

A. For fire protection requirements, refer to the HFDG Section 12.9 – “Fire Protection Systems”.

B. Wherever the NBCAE requires provision of a fire protection system, such systems must comply with the requirements of NFPA 130.

5-3.13.7.2 Utility Complexes

A. For fire protection requirements, refer to the HFDG Section 12.9 – “Fire Protection Systems”.

5-3.14 BUILDING ELECTRICAL

5-3.14.1 General

A. This Section 5-3.14 [*Building Electrical*] sets out the Electrical Design and Construction requirements for Stations, UCs and TPSS.

B. Refer to Section 11 of the HFDG regarding general requirements.

C. All electrical equipment exposed to the public must be vandal resistant, IK10 rated at a minimum.

D. In the Station crawl space, low voltage wiring must be on cable trays and high voltage wiring must be in conduits.

E. All conduits and wiring on and above the platform and roof must be concealed.

F. All junction boxes and connection boxes must be recessed or covered with architectural covers.

G. All conduits running between two different fire compartments must be sealed with fire seals and weather seals.

H. All cable trays running between two different fire compartments must be provided with fire stoppers.

I. Heritage Valley North Station: Provide an underground 50 mm conduit for future power from the electrical panel to the future arm location at the pedestrian crossing.

J. Heritage Valley North Station: Provide 3-50 mm conduits for future communication from the low voltage panel to the future arm location at the pedestrian crossing.

5-3.14.2 Marshalling Cabinets

A. Marshalling cabinets are required at Stations when the supporting UC is not located near enough to the Platform to avoid voltage drop in power wiring or signal distortion in telecommunication and data cables.

B. Marshalling cabinets must be mounted on the Platform, at locations coordinated during the design. The conduits for distribution must be concealed from the public.

C. Marshalling cabinet enclosures must be Type 316L rated for outdoor public location and must be equipped with heating and ventilation elements to ensure normal operation of equipment mounted inside them.

D. Power marshalling cabinets house 120/208 V electrical panels, lighting controls and heat trace contactors. Quantity and location of cabinets must be coordinated during the Design based on the number of electrical circuits required to feed the Station.

E. Low-tension marshalling cabinets house fiber splitters, data distribution and all equipment below 90 V. Marshalling cabinets must be provided in a master-slave configuration where the master cabinet houses the control and the main equipment and the slave cabinet houses the local distribution data routers and splitters, and interfaces. Platforms and Stations may require more than one slave. Low-tension marshalling cabinet quantities and locations must be based on the Station length and the longest cable distance to the load point.

F. The Design-Builder must Design and Construct the power and low-tension marshalling cabinets in accordance with the requirements of the HFDG Section 11.2.3.2 – “Marshalling Cabinets”.

5-3.14.3 Materials and Identification

A. The Design-Builder must Design and Construct all materials to be suitable for the location in accordance with the requirements of the HFDG Sections 11.3.1.1 – “General” and 11.3.1.2 – “Spare Parts”.

B. The Design-Builder must Design and Construct identification and color codes for all material and equipment, in accordance with the requirements of the HFDG Section 11.3.2 – “Identification”.

5-3.14.4 Permanent Standby Generators

A. The Design-Builder must Design and Construct permanent standby generators in accordance with the requirements of the HFDG Sections 11.4.6.1 – “Standby Generators” and 11.4.6.2 – “Standby Generator Replacement” and Section 4.14.7 of the Edmonton Facility Consultant Manual Volume 2.

B. Noise and vibration levels must be within acceptable levels in accordance with the City’s *Community Standards Bylaw*, 14600.

C. Where the bottom of the standby generator control panel is located higher than 1.5 m above grade, a platform must be provided for access to the generator control panel.

5-3.14.5 Portable Generators

A. Connections for a portable generator must be provided in accordance with the requirements of the HFDG Section 11.4.7 – “Portable Generators” and Section 4.14.7 of the Edmonton Facility Consultant Manual Volume 2.

5-3.14.6 Distribution Panelboards

A. Distribution panelboards with breakers are the only acceptable Design for Stations. These panelboards are mounted in UCs and power marshalling cabinets. Short circuit analysis and coordination studies must be performed to size the panels safely.

B. The Design-Builder must Design and Construct distribution panelboards and breakers and select the safe interrupting capacity by performing short circuit analysis and coordination studies in accordance with the requirements of the HFDG Section 11.4.8 – “Distribution Panelboards”, and Sections 1.9.2.5 and 1.9.4 of the Edmonton Facility Consultant Manual Volume 2.

5-3.14.7 Equipment Clearance

A. The Design-Builder must Design and Construct the equipment clearance in accordance with the requirements of the HFDG Section 11.4.9 – “Equipment Clearances”.

5-3.14.8 Uninterruptable Power Supply

A. A UPS with Maintenance by-pass must be designed to carry telecommunication and critical loads. The size and duration of back-up must follow the HFDG Section 11.5 – “Uninterruptable Power Supply (UPS)” and Section 4.14.7.6 of the Edmonton Facility Consultant Manual Volume 2.

5-3.14.9 Electrical Heat Trace Systems

A. The Design-Builder must Design and Construct heat tracing systems in accordance with the requirements of the HFDG Section 11.6 – “Electrical Heat Trace Systems”.

B. Contrary to Section 11.6.1 of the HFDG, heat tracing of drains along pedestrian ramps is not permitted.

C. Electric heat tracing must be self-regulated, N+1 redundancy with alarm dial-out functionality. Replacement must be with a single pull with OHS accessible cleanouts. N+1 redundancy only applies to the electric heat tracing cable in cases where future access is limited, inaccessible, or the electric heat tracing cable cannot be re-pulled in a single pull.

D. Electrical heat trace systems are required for gutters, rainwater leader and in horizontal storm pipes to below the frost line. Electrical heat trace systems must be installed inside gutters, rainwater leader, downspouts and horizontal storm pipes, not wrapped around the outside of pipes.

E. Electrical heat trace systems are required for water meters and the incoming and outgoing water pipes as necessary to prevent water freezing. Insulate pipes when required.

F. Electrical heat trace contactors must be located in marshalling cabinets or in utility rooms at a Station. The power feed of heat trace systems must be of ground fault circuit interrupting type.

G. All heat trace cables and contactors must be accessible for service and maintenance.

5-3.14.10 Fire Alarm and Detection

A. The Design-Builder must Design and Construct the fire alarm and detection system in accordance with the requirements of the HFDG Section 11.7 – “Fire Alarm and Detection”.

B. Fire alarm system must be hard wired Class A addressable type with auto-dialers connected to a third-party monitoring company and to the OCC. The Design-Builder must review the benefits of having the system as single-stage or a dual stage. Zones must be indicated on floor plans and on schedules.

C. Fire alarm control panel must be powered from a dedicated AC circuit and from a battery back-up. Wiring must be of fire alarm system type and must be protected from mechanical damage.

D. All detection devices must be addressable, all gas detectors must be connected to fire alarm panel.

E. HVAC equipment must be shut down by relays controlled by the fire alarm control panel.

F. Fire alarm system must be tested and verified before occupancy of the facility.

G. Fire alarm system, equipment, mounting heights and locations must comply with CSA-B561 and all CAN/ULC codes related to fire alarm system.

H. Dial-up phone lines must be connected to fire alarm panel as per CAN/ULC codes.

5-3.14.11 Lighting

A. The Design-Builder must Design and Construct all lighting systems to comply with IES Handbook and NECB, and in accordance with the requirements of the HFDG Section 11.8 – “Lighting” and the Edmonton Facility Consultant Manual Volume 2.

B. All luminaires must be LED.

C. Luminaires that are installed above the Platform edges and located inside the OCS boundaries must have remote drivers and be installed in boxes at the wall of Shelters or service rooms and mounted at accessible heights for ease of servicing. Refer to Figure Typical Platform Section Diagram available as Disclosed Data.

D. All luminaires in public areas must be of vandal resistant/impact resistant type and without pre-cut cord ends.

E. The Design-Builder must submit a lighting calculation report.

F. Speciality and architectural luminaires must be approved by the City. Bollard and handrail luminaires are not permitted.

G. The enclosure, lens, diffuser and type of luminaire must be selected to suit locations and applications.

H. Wiring from an electrical room or from marshalling cabinets must follow concealed paths. Wiring paths in the crawl space must be in conduits for high voltage and in cable trays for low voltage. Between different fire compartments, fire seals and weather seals are required for conduits and fire stops are required for cable trays.

I. Lighting control systems must use a low voltage relay system, designed for energy conservation and must comply with applicable codes.

J. Lighting controllers must be located in marshalling cabinets and/or utility room at Platforms.

K. The Design of facility lights and landscape lights must be coordinated to confirm available voltages, available panels, and system compatibility. Lighting must have its own dedicated electrical and control panel.

5-3.14.12 Emergency Lighting and Exit Signs

A. Emergency lighting and exit signs must be LED and must comply with IES Handbook and NECB.

B. The Design-Builder must Design and Construct the emergency lights and the exit signs in accordance with the requirements of the HFDG Section 11.8.7 – “Emergency Lighting” and of Section 4.14.7 of the Edmonton Facility Consultant Manual Volume 2.

C. All emergency lighting and exit signs must be of vandal resistant type.

D. Exit signs must be of running-man/pictogram green type.

5-3.14.13 Grounding and Bonding

A. The Design-Builder must Design and Construct the grounding system and bonding for structures in accordance with the requirements of the HFDG Section 6.4.7.10 – “Structure Grounding and Bonding”.

B. The Design-Builder must Design and Construct ground grid studies at UCs and TPSS in accordance with the requirements of the HFDG Section 6.2.2.4 – “Step, Touch, and Ground Potential Rise Analysis”.

C. The Design-Builder must Design and Construct lightning arrestor grounding for the Traction Power system in accordance with the requirements of the HFDG Section 6.4.7.10 – “Structure Grounding and Bonding”.

D. The Design-Builder must Design and Construct ground isolation for signals in accordance with the requirements of the HFDG Section 7.16.3.2 – “Ground Isolation”.

E. The Design-Builder must Design and Construct grounding for communication systems in accordance with the requirements of the HFDG Section 8.4.11 – “Grounding”.

F. The Design-Builder must Design and Construct grounding for utility and stand-alone service buildings in accordance with the requirements of the HFDG Section 10.10.1.5 – “Grounding”.

G. The Design-Builder must Design and Construct grounding and bonding in accordance with the requirements of the HFDG Section 11.10 – “Grounding and Bonding”.

H. The Design-Builder must Design and Construct bonding of rebar as per the recommendations of the Stray Current Mitigation Program in accordance with the requirements of the HFDG Chapter 13 – “Corrosion and Stray Current”.

I. The Design-Builder must Design and Construct grounding and bonding in accordance with the requirements of Chapter 4 of the Edmonton Facility Consultant Manual Volume 2 and Section 10 of the Canadian Electrical Code.

J. The Design-Builder must Design and Construct grounding bar for every electrical, communication and signal room and in accordance with the requirements of Chapter 2 of the Edmonton Facility Consultant Manual Volume 2.

5-3.14.14 Lightning Protection/Surge Analysis

A. The Design-Builder must perform lightning surge analysis in accordance with the HFDG Section 6.2.2.5 – “Lightning/Surge Analysis”.

B. The Design-Builder must perform a lightning surge analysis to confirm that lightning and surge protection devices are correctly placed and adequately designed to withstand the maximum lightning and surge values in accordance with the requirements of the HFDG Section 11.2.5.4 – “Lightning/Surge Analysis”.

C. Lightning analysis must be performed in accordance with CSA B72.

D. The Design-Builder must Design and Construct power distribution and lightning protection in accordance with the requirements of the HFDG Chapter 11 – “Electrical”.

E. The Design-Builder must Design and Construct surge arrestors for outdoor CCTV cameras in accordance with the requirements of the HFDG Section 8.4.10 – “Surge Arrestors”.

F. The Design-Builder must Design and Construct power distribution and lightning protection in accordance with the requirements of Chapter 4 of the Edmonton Facility Consultant Manual Volume 2.

5-3.14.15 Corrosion and Stray Current Control

A. The Design Builder must Design and Construct a stray control system to prevent corrosion and current leakage from LRT infrastructure, surface structures, above and below ground structures and facilities and structures adjacent to or crossing the LRT ROW in accordance with the requirements of the HFDG Chapter 13 – “Corrosion and Stray Current”.