

2.0 PROJECT DESCRIPTION

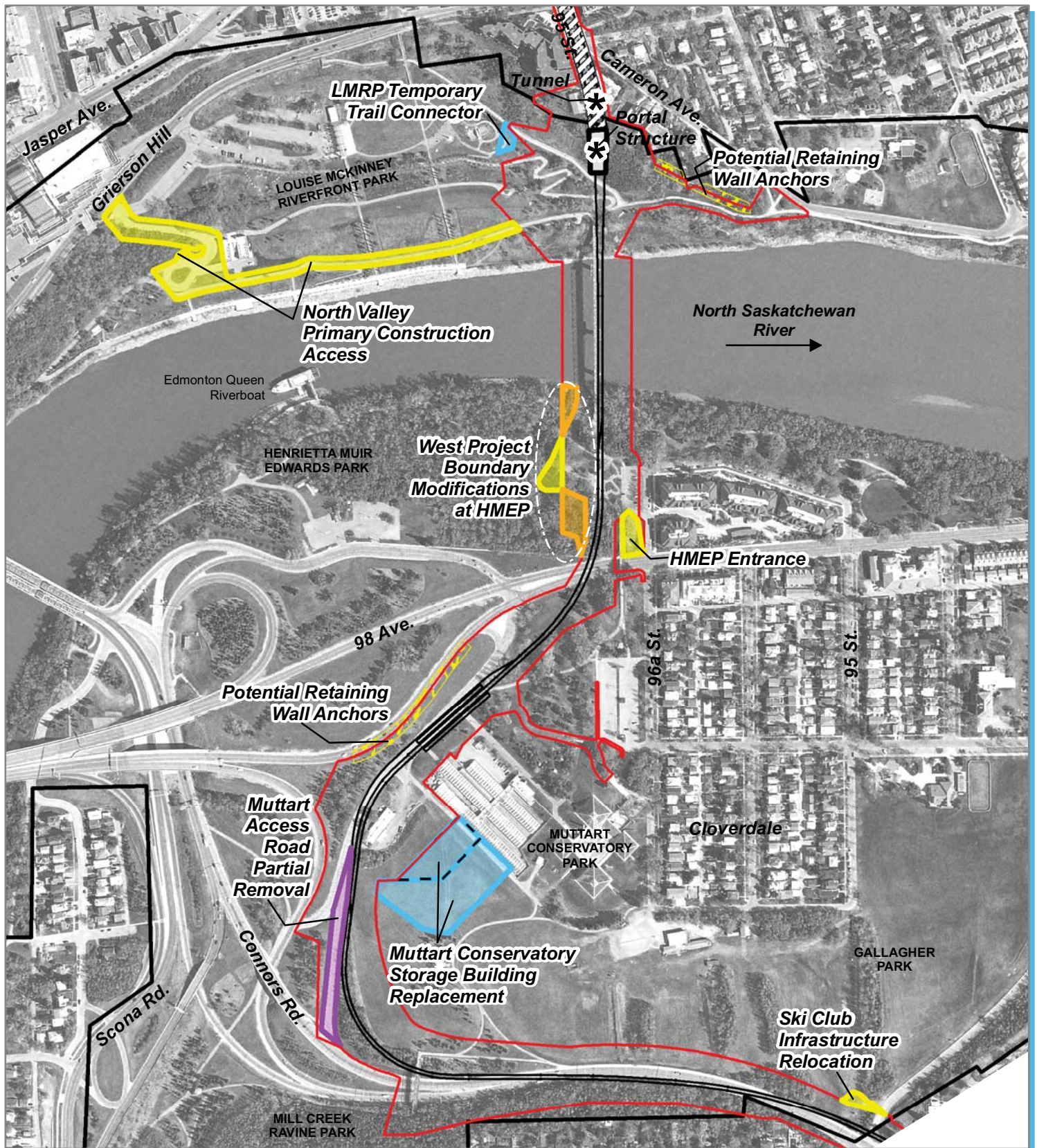
2.1 *Changed Project Components*

Figure 2.1a illustrates the location and spatial extent of the eight project components assessed in this update; Figures 2.1b through 2.1d show these components at a finer-scale. Six of these components will be included in the scope of work to be undertaken by Project Co, and two will be undertaken by the City of Edmonton as preparatory (early) works (see Figure 2.1a).

2.1.1 *North Valley Primary Construction Access - Project Co Component*

The 2013 EISA identified the primary north river valley construction access corridor as moving through the east side of LMRP. The identified route involved approaching the park along the edge of Riverdale Neighbourhood, following Cameron Avenue to its intersection with 94 Street and 99 Avenue, then moving west into LMRP using the Trans Canada Trail SUP. The 2013 Project Area included the lands along that SUP. This route was also identified as the required permanent emergency and maintenance access route to the portal and tunnel (Figure 2.1b). The 2013 EISA identified the possible need for a secondary construction access from the west, through LMRP, but a specific location was not discussed, nor was the specific purpose of a secondary access route discussed. Because of this, associated impacts were not described. At that time, it was assumed that any secondary access would be used only for select but unspecified activities and would not require physical modification of park lands. It was agreed that if a need to use lands in the western end of LMRP in this way emerged, the impacts would be assessed in later project planning.

Since that time, additional planning and community group consultation has determined that the designated primary construction access route will be through the west half of LMRP, entering the park from Grierson Hill Road and accessing the valley slope east to the west edge of the Project Area that was described in 2013 (Figure 2.1b). From there access would then continue within the approved 2013 Project Area. The original east park route using Cameron Avenue is now identified as the secondary access route, to be used only at select times during construction on an as-needed basis, when the west, primary access route is unavailable to Project Co. The proposed primary construction access road will be temporary only but present for the duration of construction in the north valley, a period lasting approximately five years; the east permanent emergency access and maintenance road will remain as described in the 2013 EISA and, as before, both roads will be designed and constructed by Project Co.



Legend

Additional Lands

Undertaken by Project Co

Excluded Lands

Areas Removed from Project Area

No Lands Change - Undertaken by Project Co

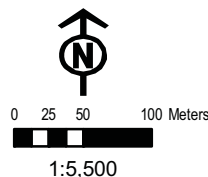
Road Removal/Landscaping
 Potential Retaining Wall Anchors (Sub-Surface Work Only)

Lands Involved in Preparatory (Early) Works

Undertaken by City of Edmonton
 Lands Previously Assessed in 2013 EISA
 Project Area
 Valley Line LRT Alignment (Reference Design)
 Bylaw 7188 Boundary
 Indicative Location Only

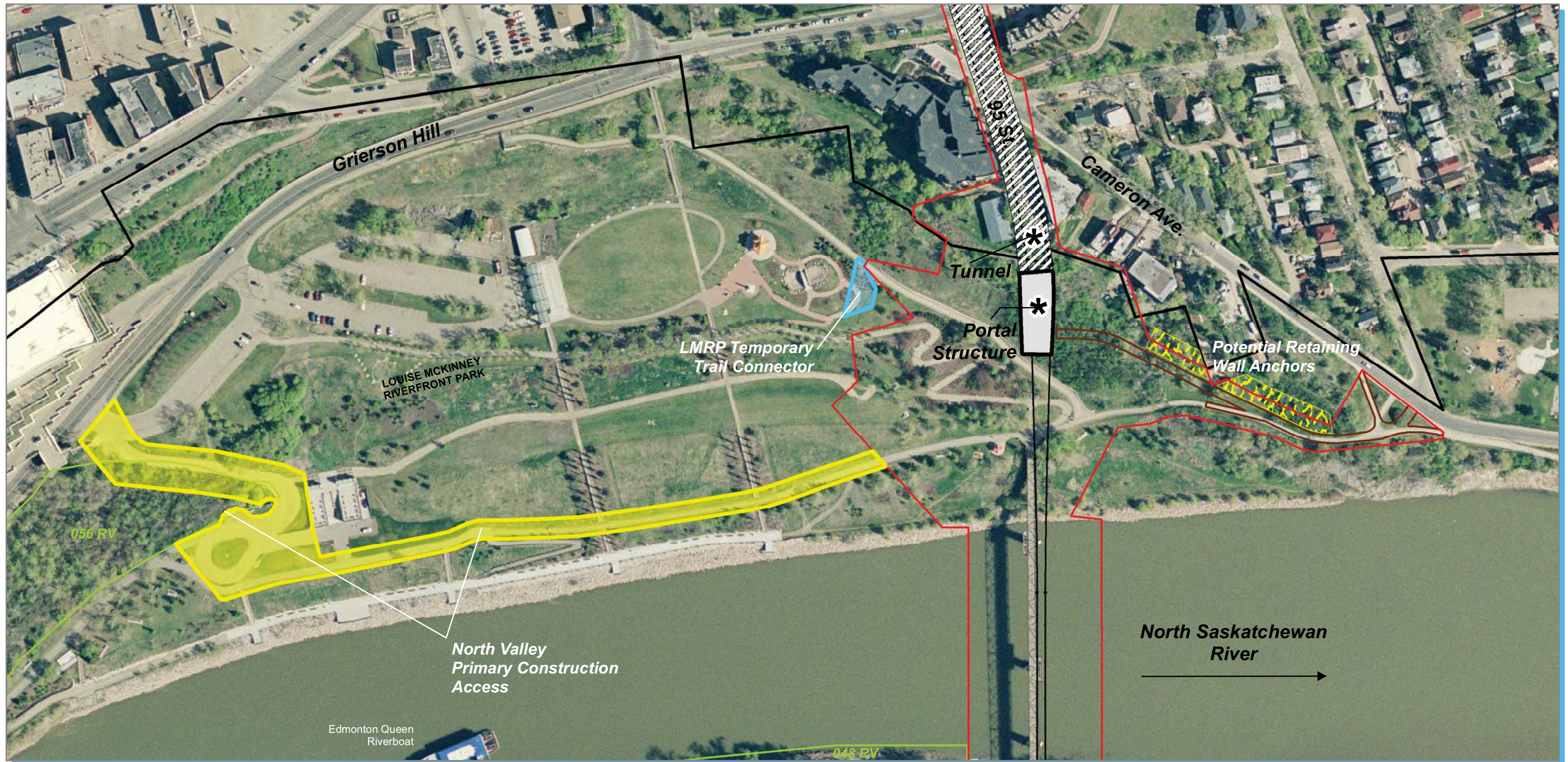
Figure 2.1a Project Components Assessed in EISA Update

City of Edmonton LRT Valley Line - Stage 1 EISA Update



Aerial Photograph Date: May 2012
 Date Map Created: 10 February 2015





Legend

Additional Lands

Undertaken by Project Co

Excluded Lands

Areas Removed from Project Area

No Lands Change - Undertaken by Project Co

Road Removal/Landscaping

Potential Retaining Wall Anchors (Sub-Surface Work Only)

Lands Involved in Preparatory (Early) Works

Undertaken by City of Edmonton

Lands Previously Assessed in 2013 EISA

Project Area

Valley Line LRT Alignment (Reference Design)

Portal Access Route

Bylaw 7188 Boundary

City of Edmonton River Valley Natural Areas (2010)

Indicative Location Only

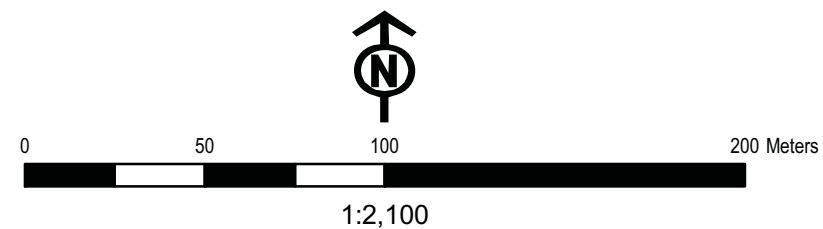


Figure 2.1b Project Components Assessed in EISA Update

City of Edmonton LRT Valley Line - Stage 1 EISA Update

Aerial Photograph Date: May 2012
Date Map Created: 10 February 2015





Legend

Additional Lands

Undertaken by Project Co

Excluded Lands

Areas Removed from Project Area

No Lands Change - Undertaken by Project Co

Road Removal/Landscaping

Potential Retaining Wall Anchors (Sub-Surface Work Only)

Lands Involved in Preparatory (Early) Works

Undertaken by City of Edmonton

Lands Previously Assessed in 2013 EISA

Project Area

Valley Line LRT Alignment (Reference Design)

Portal Access Route

Bylaw 7188 Boundary

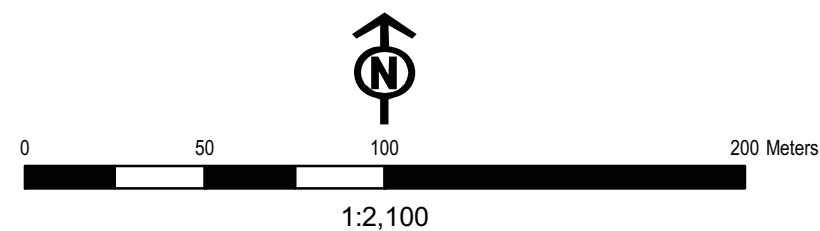
City of Edmonton River Valley Natural Areas (2010)

Indicative Location Only

Figure 2.1c Project Components Assessed in EISA Update

City of Edmonton LRT Valley Line - Stage 1 EISA Update

Aerial Photograph Date: May 2012
Date Map Created: 10 February 2015





Legend

Additional Lands

Undertaken by Project Co

Excluded Lands

Areas Removed from Project Area

No Lands Change - Undertaken by Project Co

Road Removal/Landscaping

Potential Retaining Wall Anchors (Sub-Surface Work Only)

Lands Involved in Preparatory (Early) Works

Undertaken by City of Edmonton

Lands Previously Assessed in 2013 EISA

Project Area

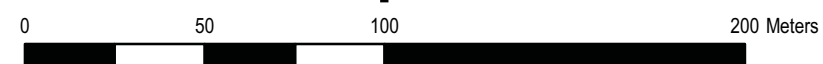
Valley Line LRT Alignment (Reference Design)

Portal Access Route

Bylaw 7188 Boundary

City of Edmonton River Valley Natural Areas (2010)

Indicative Location Only



1:2,100

Figure 2.1d Project Components Assessed in EISA Update

City of Edmonton LRT Valley Line - Stage 1 EISA Update

Aerial Photograph Date: May 2012
Date Map Created: 10 February 2015



The proposed primary north valley construction access route enters LMRP from Grierson Hill Road near the Shaw Conference Centre, at the park main vehicle access point (Plate 2.1). From there, the access road travels southeast along the existing paved maintenance vehicle access, to the Riverfront Plaza, and then ties into an existing paved SUP (Figure 2.1b; Plate 2.2). The entire route follows existing asphalt, of variable width. Project Co will be required to design and construct the access road to the standard needed to carry out the work safely and without adversely affecting slope stability in the park. Based on the anticipated types of required construction equipment and the anticipated volume of traffic, Project Co is expected to upgrade the existing route. At a minimum, this is expected to involve some re-grading along the SUP to create a road base, and some preparatory work to assure a stable base. The road will have to accommodate two-way construction traffic and must fit within the corridor shown on Figure 2.1b. Temporary fencing may be installed to ensure safe separation of the route from public areas. The tight curves and narrow width of the existing access road from Grierson Hill to the Riverfront Plaza may be unable to accommodate large construction equipment. Thus, at this stage the City has not ruled out the need for Project Co to widen that route, which may require some clearing into adjacent natural vegetation.



Plate 2.1. Segment of proposed Louise McKinney Riverfront Park Construction Access Road using existing maintenance road, looking northeast.



Plate 2.2: Trans Canada SUP to be used as Primary construction Access Route in LMRP.

Only activities specific to construction and operation of this temporary access road will be permitted in the Project Area delineated for this component as shown in Figure 2.1b. Lands identified as part of the primary construction access road will not be available for general construction activities (i.e. staging and material storage) and the installation of permanent infrastructure associated with the Valley Line LRT will not be permitted. Once construction activities on the north valley wall and riverbank are completed, the temporary construction access road lands will be returned to the pre-disturbance grades and similar or better condition. All disturbed vegetation will be re-established.

The construction access road will support high volumes of traffic during select construction activities such as tunneling, fill placement, concrete pours, steel installation and bridge demolition and at least some of these activities will consist of numerous heavy loads for periods lasting many days. While in use as the Valley Line construction access, the existing vehicular access road must also remain available to others for servicing of the facilities at the Riverfront Plaza, including the holding tank and future lift station.

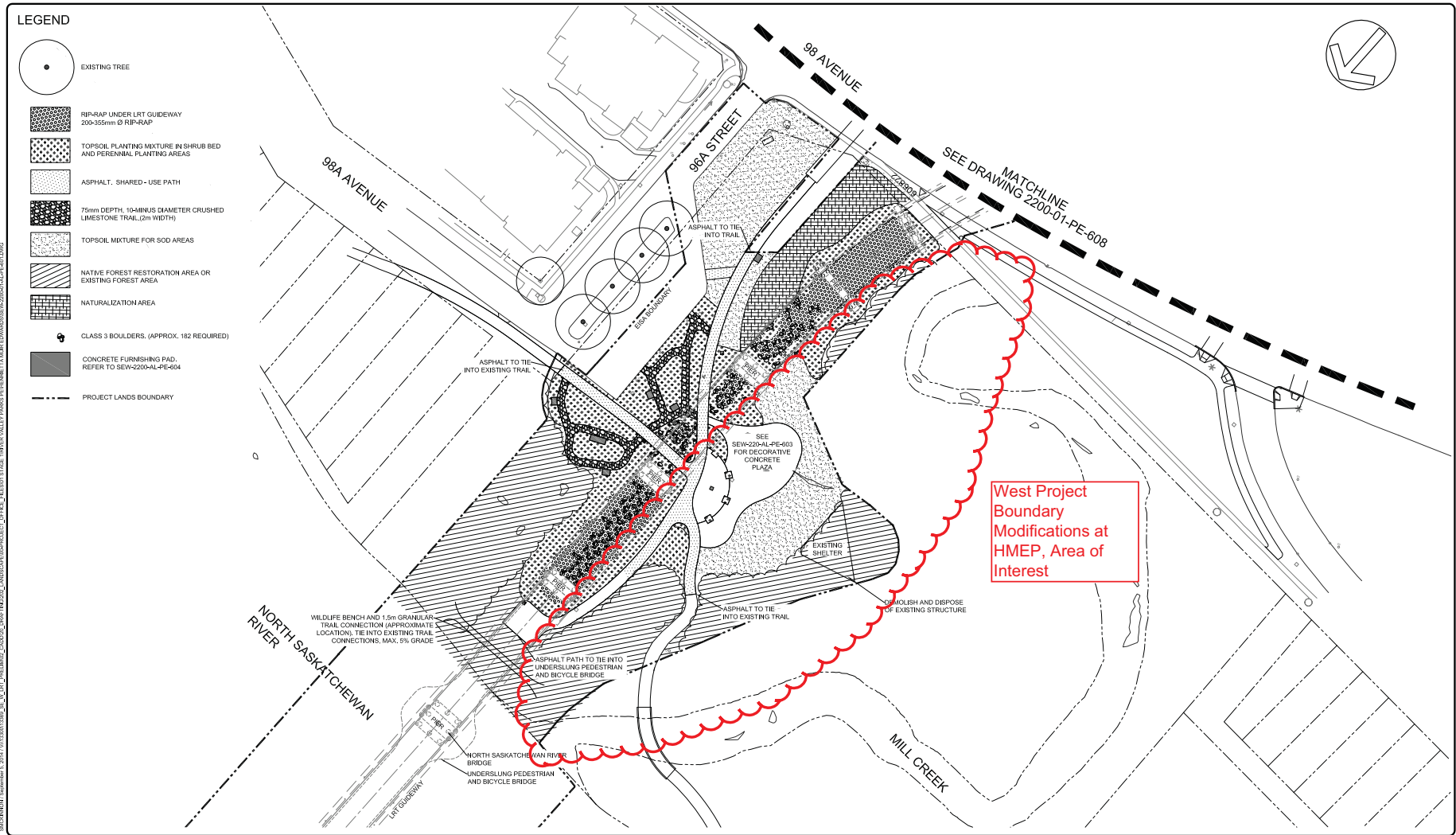
Alternatives Considered

When the City determined a need for a primary access route through west LMRP, LRT D and C identified three possible routes, consulted with Community Services and in November 2013 initiated an alternatives analysis exercise, considering in brief: constructability, slope issues, existing park conditions and impacts to park facilities and programming. The outcome of the route analysis was adoption of the route assessed here and shown on Figure 2.1b as the preferred alternative. The memo detailing this analysis is provided in Appendix A.

2.1.2 *West Project Boundary Modifications at HMEP - Project Co Component*

The City proposes to modify the western Project Area boundary, within HMEP, in two ways (Figure 2.1c) for two very different reasons. The 2013 EISA project description included demolition of a derelict picnic shelter near the west margin of the Project Area and use of those lands for general construction. The picnic area includes a shelter, benches and picnic tables (Plate 2.4). Closer inspection of the aerial photograph base overlain by the Project Area boundary revealed that, as drawn, the boundary cut through the shelter and thus did not allow for its demolition as part of the project. At the same time, LRT D and C continued to examine the impact of the Project on the Crown-owned bed and shore of the abandoned Mill Creek, north of 98 Avenue. It became evident that if the Project Area could be extended west to include the whole of the picnic area and be made available to Project Co for general construction use such as staging, lands encompassing the bed and shore of Mill Creek, and supporting native forest, could be removed from the Project Area, without adversely affecting constructability. Lands to be added to the Project Area, in support of picnic shelter demolition and used for general construction, total approximately 800 m². Lands to be removed from the Project Area include two parcels, approximately 539 m² and 1138 m² in area, totaling approximately 1677 m². Overall, the HMEP west project boundary modification represent a reduction of approximately 877 m² in land disturbed by construction activities. In combination, these proposed modifications, one extension and two reductions, were seen as a net gain in environmental protection. Furthermore, the subsequently developed 70% River Valley Landscape Drawings reflect the demolition of the picnic shelter, and show this area as re-landscaping of a portion of those lands and native forest restoration (Figure 2.2).

In summary, the proposed west boundary of the Project Area in HMEP involves an expansion in one location and a reduction in two locations. The boundary adjustment not only reduces impact on Mill Creek and the adjacent native balsam poplar forest, some lands currently supporting a hard-surfaced area would be returned to native forest.



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Figure 2.2



Plate 2.3. HMEP west project boundary modifications, looking west; picnic shelter and paving stone area (Sept. 2013).



Plate 2.4. Derelict picnic shelter and grounds in HMEP (April 2013).

2.1.3 HMEP Entrance - Project Co Component

The 2013 EISA Project Area deliberately excluded from the Project Area a small parcel of land situated between the 98 Avenue Pedestrian Bridge and 96A Street (Figure 2.1c; Plate 2.5). Subsequent planning has determined that inclusion of this approximate 763 m² area of land would create more flexibility for Project Co to provide continuous pedestrian access to 98 Avenue Pedestrian Bridge, as required in the contract. In earlier planning stages it was thought that excluding the lands would assist in assuring continuous access to the bridge, but by adding that small parcel, Project Co would have more flexibility to provide access to and from that bridge terminus, in a manner that best suits sequential construction stages. The contract will still require that pedestrian access to the bridge be maintained at all times. Post-construction, this area would be reclaimed through landscaping.



Plate 2.5. Area of proposed boundary changes at HMEP entrance (98 Ave and 96A St), looking northeast (June 2014).

2.1.4 *Retaining Wall Ground Anchors - Project Co Component*

The 2013 EISA identified the need for the installation of one or more retaining walls in the vicinity of Muttart Stop and along the permanent portal emergency and maintenance access route. The need for these retaining walls and the possible use of ground anchors as a means of providing wall support was acknowledged in the 2013 EISA. These robust, typically steel anchors are drilled or driven (pounded) at a downward angle into adjacent lands at increasing depth. The length of the anchor is, in part, a function of the height of the wall, and the anchor often extends as far as four times the height of the wall. Thus, at the two identified locations, ground anchors, should Project Co choose to use them, would extend beyond the previously identified Project Area, occupying an area coarsely depicted in Figure 2.1b and 2.1c. The installation of retaining wall anchors does not require surface disturbance. Such anchors are commonly used when new infrastructure is installed in built environments and installation without disturbing adjacent infrastructure is a proven procedure. Final design of the retaining walls and their support methods will be the responsibility of Project Co and, at these locations, ground anchors will be among the available options. The contract will not permit the anchors to extend past the limits of City-owned land and under privately-held lands. Following construction, anchor locations will be documented and registered and thus on record with Alberta First Call. There will be no post-construction restrictions on surface use of lands underlain by anchors.

Following is a technical description of ground anchors, their utility and the benefits of having this method remain available to Project Co. This description was developed for EISA Update purposes by Thurber Engineering. Permanent or temporary excavations in constrained sites are typically supported using non-gravity, cantilever or anchored/braced retaining walls. For both systems, support is provided through the shear and bending stiffness of the vertical wall elements and the passive resistance from the soil below the finished excavation grade. For anchored/braced walls, added support is provided by the lateral resistance of the ground anchors or internal bracing elements. Because of lack of lateral restraint, cantilever walls undergo larger lateral deformations than anchored/braced systems, and their use is often limited to supporting excavations shallower than about 5 m.

For deep excavations in certain design and soil conditions, ground anchors and anchored retaining systems offer some key technical and economic advantages over cantilever or internally braced walls. A summary of these advantages is noted below:

- Anchored walls can resist relatively large horizontal pressures without requiring a significant increase in wall cross section;
- The active forces applied by pre-stressed ground anchors are an effective way of limiting wall deformations, which is particularly important in design situations where strict control of lateral movement of retained ground is required (e.g. excavations of steep or marginally stable slopes, excavations near sensitive structures, etc.);
- The use of ground anchors can reduce the required embedment of vertical wall elements below the excavation grade line;

- The use of ground anchors offers unobstructed workspace inside the excavations.
- Typical industry practice involves verifying the actual performance of ground anchors via full scale field testing during construction.

Construction of a ground anchor involves the insertion of high strength steel element (bar or stand) into a predrilled hole that extends a certain design distance behind the excavation face. The hole is subsequently filled with cement grout (usually under pressure) and the steel member pre-tensioned. The pre-stressing force is transmitted to the retaining structure at the cut face via an anchorage system. Figure 2.3a shows a schematic diagram of the main components of a typical ground anchor. Figure 2.3b illustrates the construction sequence of one type of anchored retaining wall systems, namely, soldier piles and lagging.

For ground anchors to be effective, they should be installed into competent soil or bedrock beyond any potential slip surfaces. Ground anchors are commonly installed at angles of 15 to 30 degrees below the horizontal, and can extend generally between 12 and 40 m behind the excavation face. An assessment of the feasibility of ground anchors at a given site should consider underground obstructions/utilities, soil and groundwater conditions, right-of-way and easement limitations and effects on adjacent structures.

In Edmonton, ground anchors have been used successfully on many projects, including the Shaw Conference Center, the south riverbank portal of the existing LRT line, and the widening of Fox Drive and Scona Road. Ground anchors in Edmonton are usually embedded into hard glacial till, dense Saskatchewan sand and gravel, or clay shale/sandstone bedrock.

Figure 2.3a

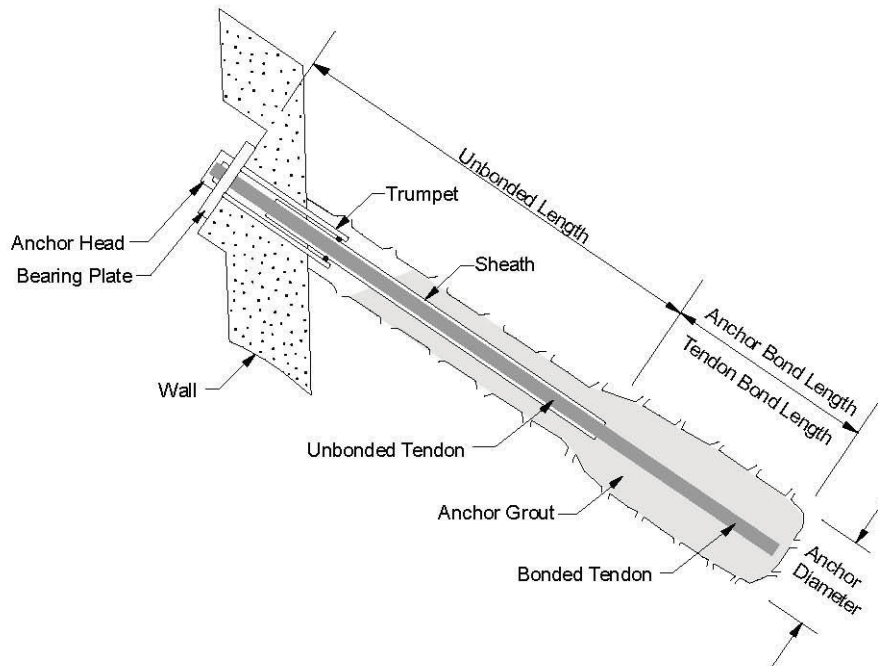
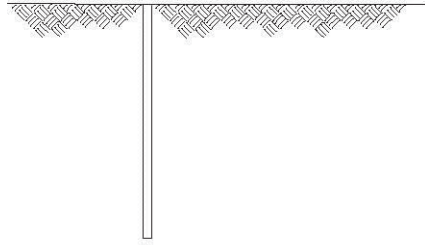
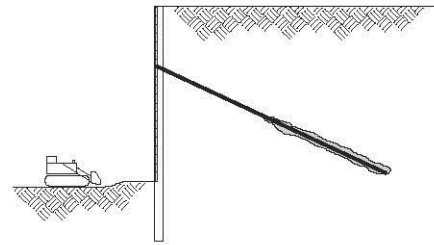


Figure 1 – Main Components of a ground anchor (FHWA, 1999)

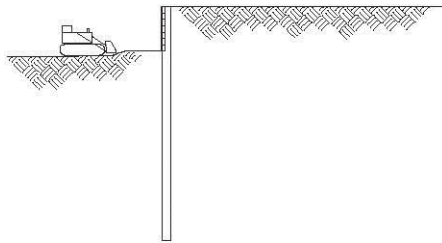
Figure 2.3b



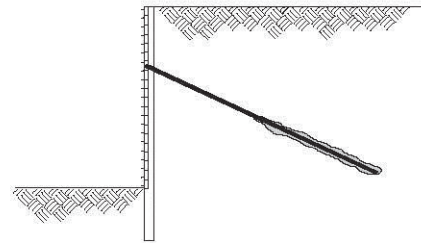
STEP 1: Install soldier beam



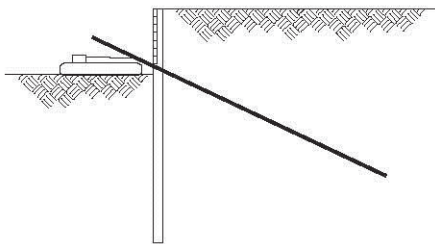
STEP 4: Complete excavation



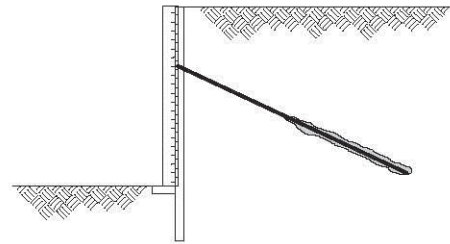
STEP 2: Excavate and install lagging



STEP 5: Install headed studs and prefabricated drainage



STEP 3: Install and test ground anchor



STEP 6: Pour cast-in-place facing

Figure 2 – Construction sequence for permanent soldier beam and lagging wall (FHWA, 1999)

2.1.5 *Ski Club Infrastructure Relocation - Project Co Component*

The 2013 EISA indicated that up to three Edmonton Ski Club lift towers must be relocated to accommodate a wider transportation corridor and the resulting changed grades north of Connors Road. Since then, studies of the effect of the project on the nearby ski runs have refined the City's understanding of the impact and of available and required mitigation means. As anticipated in 2013, Ski club infrastructure requires relocation at three locations, all of which can be undertaken within the 2013 delineated Project Area. However, at the third location, near the intersection of Connors Road and Cloverdale Hill Road, relocation of the T-bar return terminal bullwheel has implications for the associated downslope run. According to a specialist's report prepared for the City (BHA 2014), to maintain the minimum recommended unloading distance of 25 m between the relocated return terminal bullwheel and the last T-Bar tower there is a need to move the T-Bar tower slightly downslope and re-grade a small area to create a new suitable landing area. The existing operator shack shown in Plate 2.6 will also have to move further downslope, to be near the relocated return terminal bullwheel. Re-grading falls slightly outside the 2013 boundary and thus requires a small extension of the Project Area (Figure 2.1d) adding approximately 362 m² of additional land (Plate 2.6).



Plate 2.6. Edmonton Ski Club return terminal bullwheel (foreground), operator shack (middle ground) and last tower (background) for the T-bar run, looking northwest (Jan. 2015)

For this scenario, a new tower may also have to be added to maintain passenger ropeway standards (BHA 2014). This will be finalized at a later date.

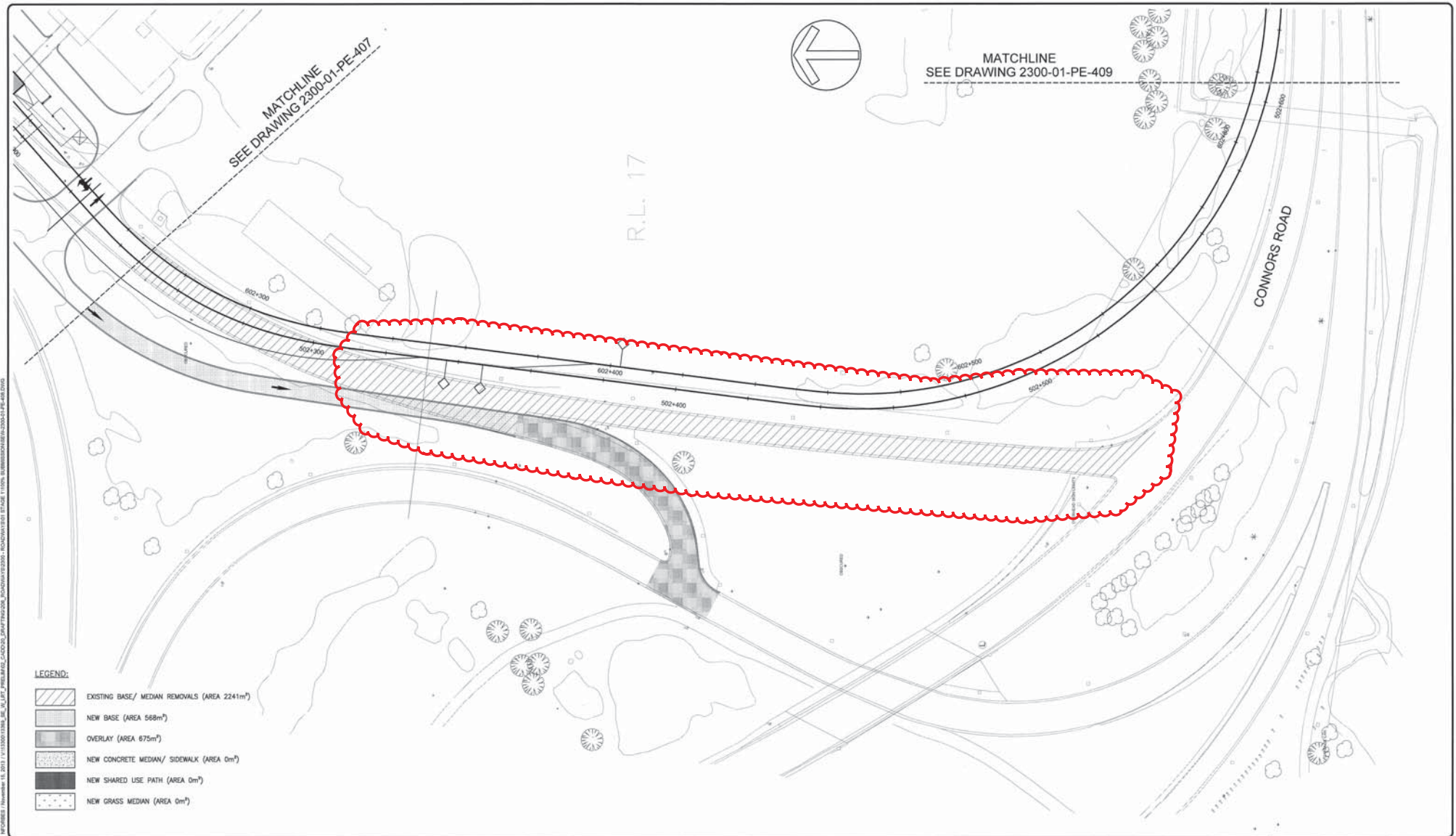
Any infrastructure removal/relocation and installation will be the responsibility of the Edmonton Ski Club, as funded and facilitated by LRT D and C. Project Co is responsible only for re-grading and the final condition of the affected lands. Project Co activities in this extended parcel will be restricted to site fencing and re-grading for ski club purposes. The re-grading between the return terminal bullwheel and last tower is mandated to occur between April 15 and August 20. This timing requirement now forms part of the contract, providing the ski club time to reinstall the equipment prior to the start of the following ski season.

2.1.6 *Muttart Access Road Partial Removal - Project Co Component*

As part of Valley Line LRT construction, the Muttart Access Road, connecting Connors Road northbound and 98 Avenue, and providing access to the conservatory grounds, will be permanently realigned to accommodate the LRT trackway and Muttart Stop. The need for realignment was covered in the 2013 EISA. As part of that realignment, closure/demolition of a 200 m long, one-way road connecting northbound Connors Road to the Muttart Access Road will be required (Figure 2.4). That connector road will be permanently removed as part of the Valley Line project. As 2013 EISA stated that the existing connector from Connors Road north would remain intact, this minor, permanent change in the road network was not fully assessed. The road removal involves approximately 2,070 m² of land. This project component differs from the others assessed in this update in that it requires no adjustments to the Project Area *and* most of the activities associated with removal would be the same as which these undertaken as part of the realignment of the access road, was covered in the 2013 EISA.

2.1.7 *Muttart Storage Building Replacement- City Component*

The 2013 EISA identified Project Co as responsible for constructing the replacement Muttart Conservatory Storage Building (MSCB) and ancillary facilities, required as a result of the location of the LRT trackway and Muttart Stop. The delineated Project Area included lands to accommodate the new facility, showed a conceptual building location and assumed that Project Co would construct the building at the time it staged construction of other facilities in that area. Subsequent planning has since refined that location, considering details such as how best to accommodate a like-for-like storage building, associated parking and delivery truck access requirements in a manner that also responds to the delivery needs of the Muttart greenhouses (Figure 2.5a – 2.5c). The final building location then shifted another 5.8 m to the southwest so as not to foreclose on the potential for a future park access road and future SUP running between the greenhouses and the storage building. Specifically, the new facility location was affected by the need to ensure effective delivery service to both the working greenhouses and the storage building. The new location had to account for efficient delivery service to both these areas and *between* the storage building and working greenhouses for items such as soil storage. The changed location led to the decision to reassign this component from the larger project to early works by the City.



- LEGEND:**
- EXISTING BASE/ MEDIAN REMOVALS (AREA 2241m²)
 - NEW BASE (AREA 568m²)
 - OVERLAY (AREA 675m²)
 - NEW CONCRETE MEDIAN/ SIDEWALK (AREA 0m²)
 - NEW SHARED USE PATH (AREA 0m²)
 - NEW GRASS MEDIAN (AREA 0m²)

C	FINAL PRELIMINARY ENGINEERING	15-11-13	R.C.
B	ISSUED FOR 90% REVIEW	07-12-12	R.C.
A	ISSUED FOR 60% REVIEW	22-06-12	R.C.
no.	description	date	appd
	issue date		
no.	description	date	checked
	revisions		

ISL Engineering and Land Services
Consultant

A1 bar scale 0 5 10 20m
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drawn by **E. CHIU** designed by **E. CHIU**
checked by **B. CAMPBELL** date **15-11-2013**

PERMIT TO PRACTICE
ISL Engineering and Land Services Ltd.
Signature: *[Signature]*
Date: **10/11/2013**
PERMIT NUMBER: P-431
The Association of Professional Engineers and Geoscientists of Alberta

9901
PROFESSIONAL ENGINEER
R. COULOMBE
11-11-2013

AECOM
Prime Consultant

Edmonton TRANSPORTATION SERVICES
prime consultant job no. **60222337**

Hatch Mott MacDonald

ISL Engineering and Land Services

DIALOG **gpc architecture**

PRELIMINARY ENGINEERING DRAWINGS
NOT FOR CONSTRUCTION

prime consultant reviewed by **M. PERRY**

drawing title
LRT CIVIL WORK PAVEMENT DETAILS

SE to W LRT
MILL WOODS TO LEWIS FARMS

drawing no. **SEW-2300-01-PE-408** REV **SHT 129**

Figure 2.4 Muttart Access Road Partial Removal

The new building is close to identical in size, shape and function as the building it is to replace. The replacement project includes re-establishment of essential ancillary facilities (a small number of parking stalls and delivery truck turn around). Much of the disturbance footprint shown in Figure 2.1d is temporary, required to accommodate the necessary re-grading (Plate 2.7) and will be returned to parkland following construction. The total project component footprint is 8,795 m², of which approximately 5,966m² (68%) will be restored to turf and possibly other small landscaping features near the facility (i.e. planted beds). Lands to be disturbed consist entirely of manicured lawn and one SUP, situated along the existing west margin of the Muttart working greenhouses. Minor realignment of that SUP will be required. Construction activities associated with this project component will be undertaken by the City in summer and autumn of 2015, prior to commencement of general construction activities associated with the Valley Line.

Since construction of the proposed replacement building will be undertaken by the City of Edmonton, the footprint for the replacement structure has been removed from the Project Co lands, as shown in Figure 2.1d, and distinguished from those lands as a City component (shown in blue). Demolition of the existing storage building for the Muttart Conservatory will be undertaken by Project Co as was described in the 2013 EISA and the existing building remains within the original Project Area. In the event that construction is not complete by spring of 2016, when Project Co is anticipated to begin work in the river valley, arrangements will be made to ensure no conflicts arise with other contractors that may be working in the area.

This assessment assumes that certain construction protection measures will be built into the MCSB replacement construction contract, with the chief one being the need to remain compliant with City of Edmonton's ENVISO program. Thus, new facility construction is assumed to be governed by a project-specific, Environmental Construction Operations (ECO) Plan, prepared by the contractor in compliance with the City's Environmental Construction Operations (ECO) Plan Framework. This plan will include a comprehensive Temporary Erosion and Sedimentation Control Plan (TESCP) that meets or exceeds the standards of the City of Edmonton's *Erosion and Sedimentation Control Guidelines* (2005). Further, the contract will specify the need to address utilities, as required. Finally, it is expected that all appropriate fuel handling procedures and occupational health and safety requirements will be followed and all construction practices will be in compliance with all City environmental bylaws.

Figure 2.5a

PROJECT DESCRIPTION:








Build a new storage building to replace the existing (**A**) as a result of the new LRT line expansion (**B**).

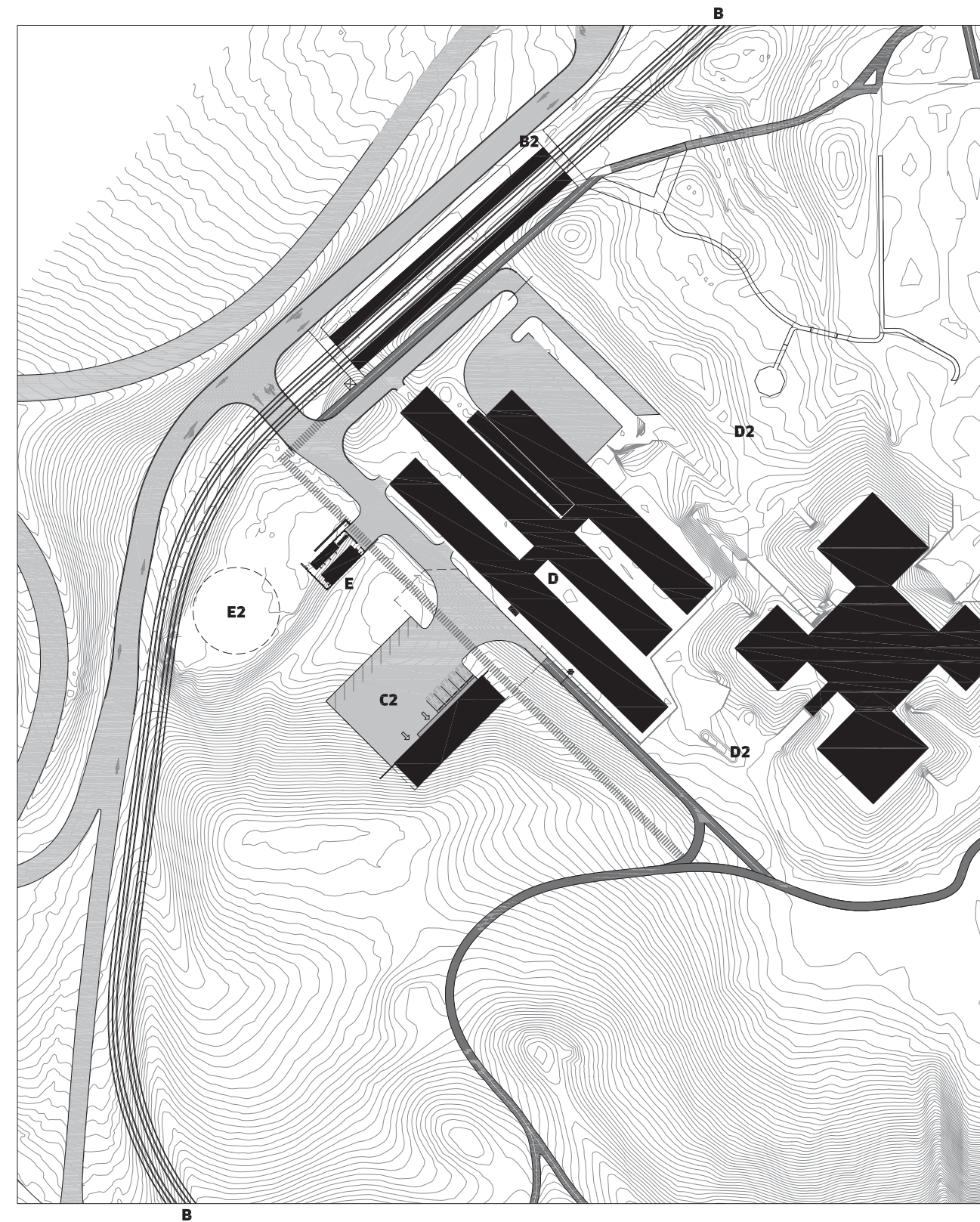
The new building (**C**) will house 3 main functions; Soil and Material Storage, Prop Storage, and a workshop for Kinsmen Fitness Centre.

REPLACEMENT STRUCTURE CONSIDERATIONS:

- Incorporate efficiencies into the building and surrounding area (**C2**) along with managing the visual impact of the structure given its new location.
- It is expected that the TPSS building (**E**) and the Muttart Conservatory Storage Building will be complimentary relative to architectural expression.
- The design of the new building is to be respectful of its surroundings in Edmonton's North Saskatchewan River Valley and the Muttart Conservatory grounds. (**D2**)

DRAWING LEGEND:

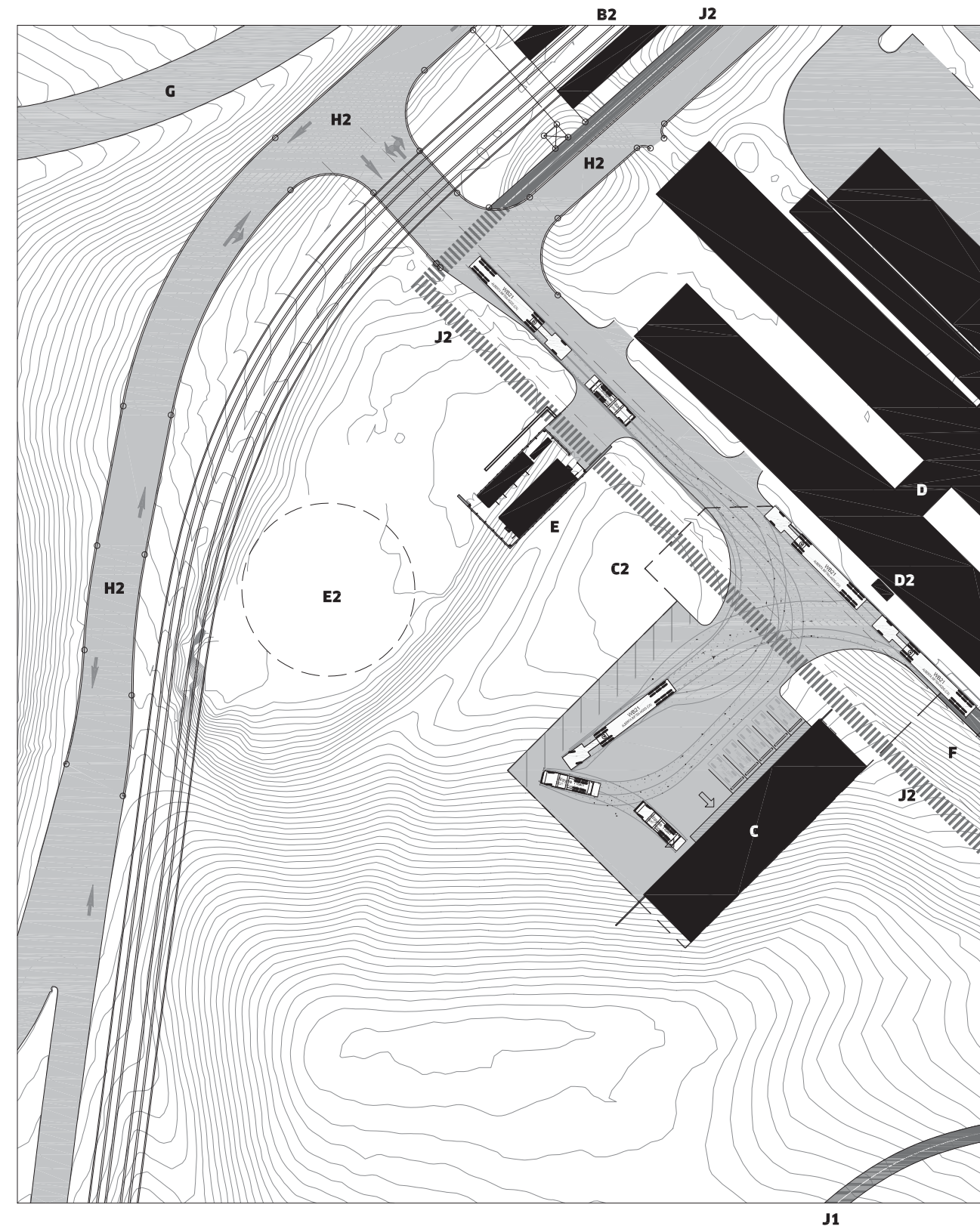
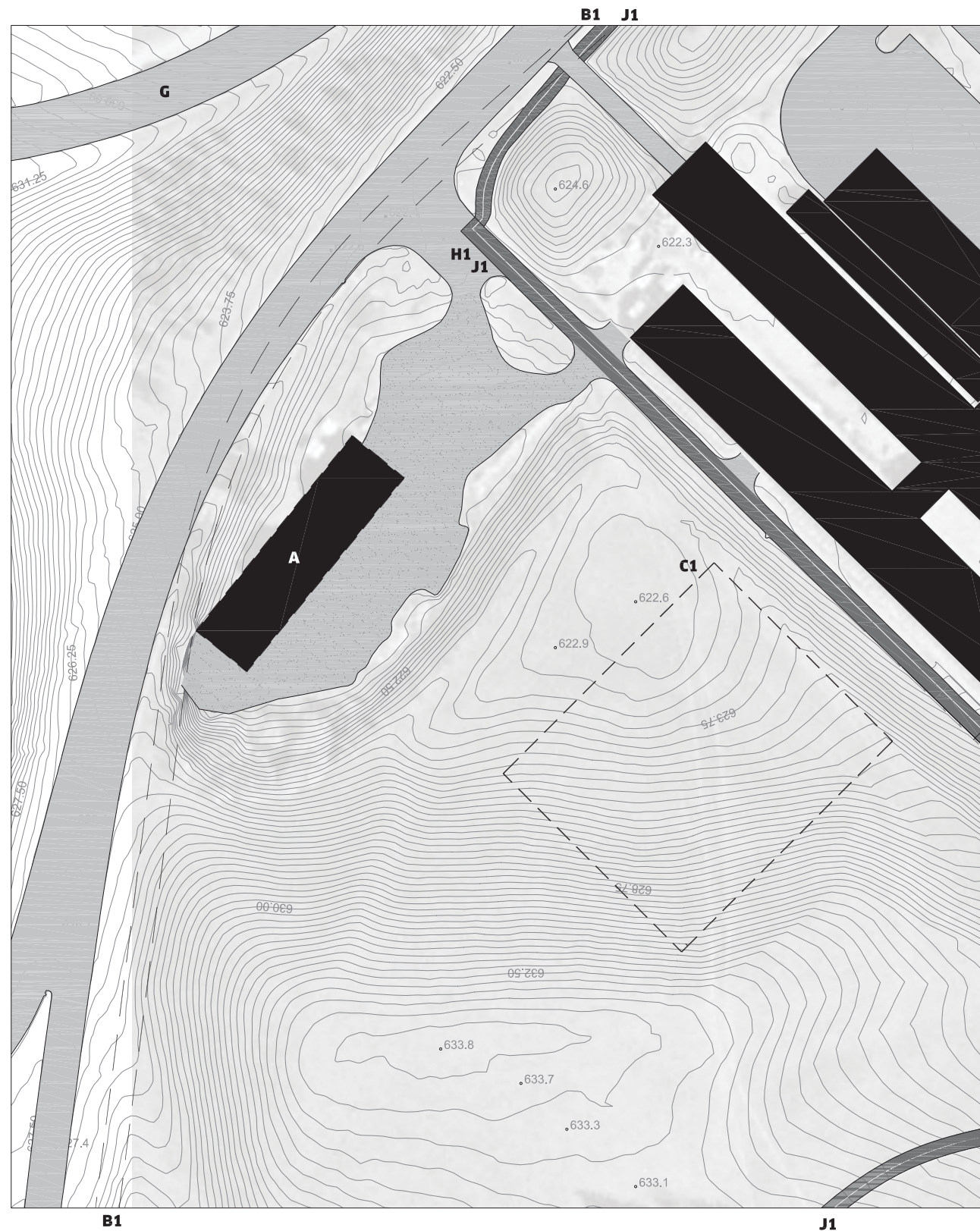
- B** Anticipated Valley-Line LRT alignment.
- B2** Valley Line LRT Stop.
- C** New Storage Building, re-located next to existing greenhouses (**D**).
- E** Traction power substation (T.P.S.S.) site, part of LRT.
- E2** Potential storm water management pond, part of LRT.
-  Shared-Use-Path (SUP)
-  Potential Future Shared-Use-Path
-  Buildings
-  Hard Surface (asphalt / pavement)
-  Gravel Surface
-  Topography (0.25m intervals)
-  L.R.T. TRACK ALIGNMENT (at grade)



 PROJECT CONTEXT - EXISTING
SCALE 1:2000

 PROJECT CONTEXT - FUTURE
SCALE 1:2000

Figure 2.5b



SITE CONTEXT DRAWING LEGEND:

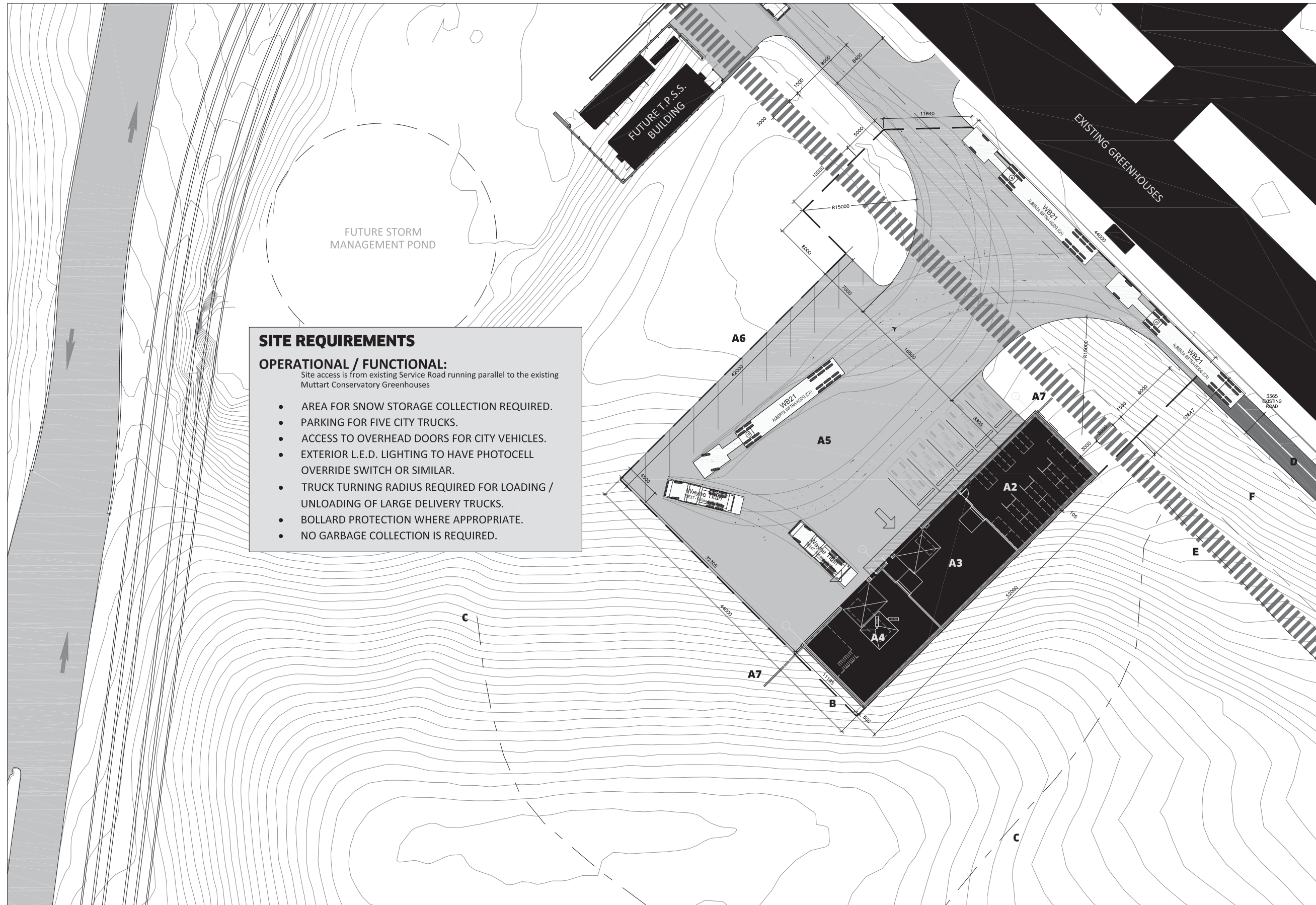
- A** Existing Storage Building.
- B1** Anticipated Valley-Line LRT alignment.
- B2** Valley Line LRT Stop.
- C** New Storage Building. = 502.8 m² or 5412.6 s.f.
- C1** Outline of Project Scope. (from RFP Figure 9.0) = 2288 m² or 0.57 acres
- C2** Outline of Project Scope (including road work) = 3043 m² or 0.75 acres
- D** Existing greenhouses.
- D2** Potential future vestibule entrance into Greenhouses.
- E** Traction power substation (T.P.S.S.) site, part of LRT.
- E2** Potential storm water management pond, part of LRT.
- G** Off-ramp from James MacDonald Bridge (98 AVE) Eastbound, one-way.
- H1** Existing Service Road, currently shared with Shared-Use-Path (SUP).
- H2** New road alignments.
- J1** Existing Shared-Use-Path.
- J2** Possible new alignment for 3.0 m Shared-Use-Path. Not part of this project scope.
- F** 9.0 m offset for Potential Future Access to Ski Club site.

- Shared-Use-Path (SUP)
- Potential Future Shared-Use-Path
- Buildings
- Hard Surface (asphalt / pavement)
- Gravel Surface
- Topography (0.25m intervals)
- L.R.T. TRACK ALIGNMENT (at grade)

1 SITE CONTEXT PLAN - EXISTING
SCALE 1:1000

1 SITE CONTEXT PLAN - FUTURE
SCALE 1:1000

Figure 2.5c



SITE PLAN DRAWING LEGEND:

New Storage Building .
= 502.8 m² or 5412.6 s.f.

- A2** Prop Storage Bay
- A3** Soils Material & Storage Bay
- A4** Fitness Repair Workshop
- A5** Outdoor yard
- A6** Snow Storage Area
- A7** Possible retaining wall

B Outline of Project Scope
(including road work)
= 3043 m² or 0.75 acres

C 3:1 grading (slope towards building) from Figure 9.0 of RFP.

D Existing Service Road, to remain.

E Possible new alignment for 3.0 m Shared-Use-Path. Out of scope.

F 9.0 m offset for Potential Future Access to Ski Club site.

- Shared-Use-Path (SUP)
- Potential Future Shared-Use-Path
- Buildings
- Hard Surface (asphalt / pavement)
- Gravel Surface
- Topography (0.25m intervals)
- L.R.T. TRACK ALIGNMENT (at grade)

SITE REQUIREMENTS

OPERATIONAL / FUNCTIONAL:
Site access is from existing Service Road running parallel to the existing Muttart Conservatory Greenhouses

- AREA FOR SNOW STORAGE COLLECTION REQUIRED.
- PARKING FOR FIVE CITY TRUCKS.
- ACCESS TO OVERHEAD DOORS FOR CITY VEHICLES.
- EXTERIOR L.E.D. LIGHTING TO HAVE PHOTOCCELL OVERRIDE SWITCH OR SIMILAR.
- TRUCK TURNING RADIUS REQUIRED FOR LOADING / UNLOADING OF LARGE DELIVERY TRUCKS.
- BOLLARD PROTECTION WHERE APPROPRIATE.
- NO GARBAGE COLLECTION IS REQUIRED.

1 SITE PLAN
SCALE 1:500



Plate 2.7. Manicured lawn of proposed MCSB replacement and parking area (hill to be re-graded in foreground, existing building will be situated mid-ground), view to northeast (Sept. 2014)

2.1.8 *LMRP Temporary Trail Connector - City Component*

Prior to commencement of Valley Line construction, to reduce the impact of the up to five years of construction on LMRP trails and facility use, the City will construct a short, temporary connector trail just west of the Project Area in the Chinese Gardens (Figure 2.1b; Plate 2.8). The temporary trail will connect the western portion of the primary north-south SUP to an established trail in the Chinese Garden, allowing pedestrians and cyclists to circulate through the broader network of park trails situated west of the main LRT project corridor and avoiding trail dead ends. The proposed temporary gravel trail will be approximately 1.5 m wide and 15 m in length. Design details and location are shown on Figure 2.6.

Construction drawings indicate that the trail will be sub-excavated to 150 mm depth, filled with compact clay and topped with gravel. Trail construction in this sloped area will involve grade changes. The grade adjacent to the existing trail will be raised using clay fill and will taper down to the existing grade with a maximum slope of 1:3 (Figure 2.6). Fill will be stabilized using 300-600 mm boulders installed at the bottom of the new embankment with one third of the boulders buried into the subgrade/topsoil. Topsoil and sod will be placed on disturbed soil adjacent to the new trail and positive drainage will be provided. The width of disturbed area will be approximately 2-3 m; total area of disturbance will be approximately 65 m².

**Temporary Trail Connector
Louise McKinney Park
River Valley**
(9529 Grierson Hill Road, Edmonton, AB)

NEW CONSTRUCTION

BY CONTRACTOR

INCIDENTALS

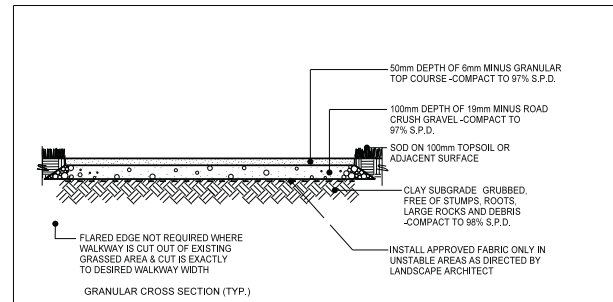
1. Contractor is responsible for mobilization and demobilization of the site. See 'Special Provisions' section of tender document for detail.
2. Contractor is responsible for 'Warranty Period Maintenance' of the site. See 'Special Provisions' section of tender document for details.

SITE PREPARATION / REMOVALS

3. Excavate 3 shrubs (1 horizontal juniper; 1.2m dia. approx., 1 multi-stemmed Sand cherry; 1.5m dia. approx., and 1 multi-stemmed maple; 2.0m dia. approx.) to accommodate new gravel trail alignment. Relocate on site as directed by project manager.
4. Strip 30 sq. m. of shrub bed mulch to accommodate new gravel trail and reserve for re-use on site. Spread excavated mulch over existing shrub bed.
5. Excavate to a depth of 150mm below the design grade, 4.5 cubic m. (30 sq.m.) of topsoil/subgrade to accommodate new gravel trail. Haul off site.
6. Strip 35 sq. m. topsoil and sod from the area adjacent to trail, to accommodate slope grading adjacent to new trail. Haul off site.

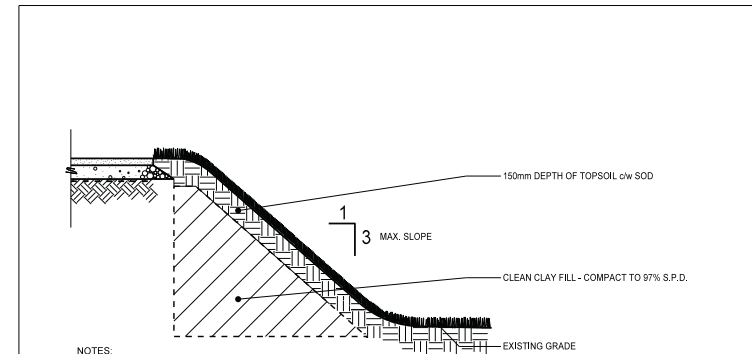
7. Build up the grade adjacent to existing trail to accommodate new trail construction. Construct 25.0 cubic m. base with clay fill adjacent to trail tapering down to existing grade. Maximum slope is 1:3. Refer to custom detail on this drawing.
8. Construct 30 sq. m. of 50mm depth granular paving c/w 150mm granular base on compacted clay sub-grade. Trail is 1.5m wide. Refer to detail LA302 on this drawing. Contact Community Project to arrange for compaction testing.
9. Install 10 sq. m. 100mm depth mulch adjacent to new trail through existing shrub bed. Ensure positive drainage
10. Install 20 sq. m. 150mm depth topsoil and sod adjacent to new trail. Ensure positive drainage.

NOTE:
THIS SITE SURVEY IS OUT OF DATE AND MAY NOT BE ACCURATE. LAYOUT AND GRADING OF EXISTING SITE IS APPROXIMATE. NEW TRAIL IS TO BE LAID OUT IN THE FIELD. QUANTITIES MAY NEED TO BE ADJUSTED ACCORDINGLY.



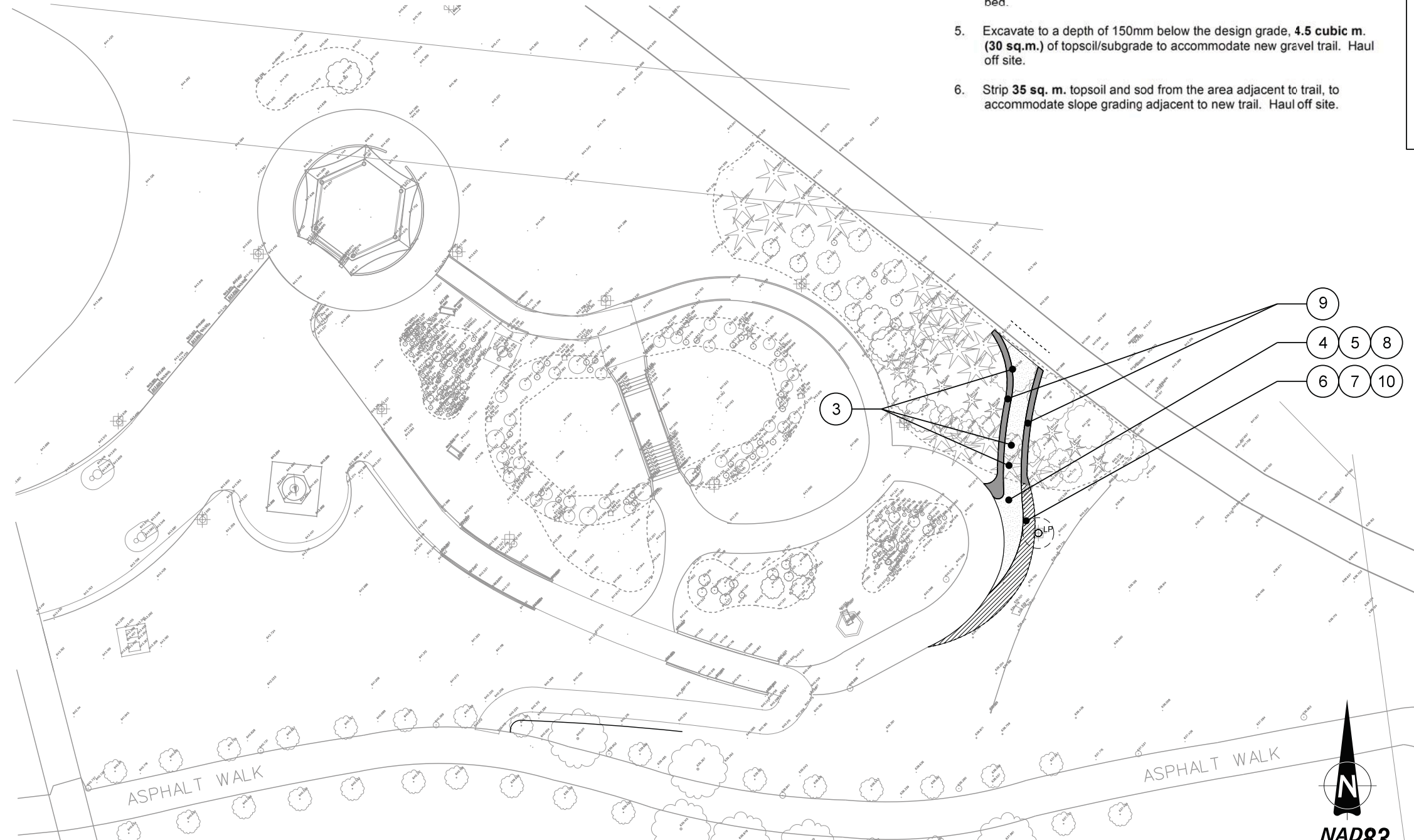
- NOTES:**
- DIMENSIONS OF GRANULAR WALKWAY AS PER LANDSCAPE DRAWINGS
 - SET GRANULAR SURFACE FLUSH WITH ADJACENT GRADES
 - ENSURE DRAINAGE OFF GRANULAR WALKWAY AT ALL LOCATIONS & IN COMPLIANCE WITH THE OVERALL SITE DRAINAGE PLAN
 - 20mm MINUS GRANULAR - SECTION 2090 & AGGREGATE DESIGNATION 3, CLASS 20A, COMPACT TO 97% S.P.D.

THE CITY OF **Edmonton** Drawing No. LA303
GRANULAR WALKWAY



- NOTES:**
- HEIGHT AND WIDTH OF SLOPE VARIES
 - SET GRANULAR SURFACE FLUSH WITH ADJACENT GRADES
 - ENSURE DRAINAGE OFF GRANULAR WALKWAY AT ALL LOCATIONS & IN COMPLIANCE WITH THE OVERALL SITE DRAINAGE PLAN
 - 20mm MINUS GRANULAR - SECTION 2090 & AGGREGATE DESIGNATION 3, CLASS 20A, COMPACT TO 97% S.P.D.

THE CITY OF **Edmonton** Drawing No. CUSTOM
GRANULAR WALKWAY SLOPE



THE CITY OF **Edmonton** ASSET MANAGEMENT & PUBLIC WORKS PARKS BRANCH
PRELIMINARY DRAWING
not for CONSTRUCTION

The Alberta Association of Landscape Architects
Gilbert Catabay

Revisions	

THE CITY OF **Edmonton** ASSET MANAGEMENT AND PUBLIC WORKS PARKS BRANCH
RIVER VALLEY (9529 Grierson Hill Road)
LOUISE MCKINNEY PARK
CHINESE GARDENS
TEMPORARY TRAIL
CONSTRUCTION DRAWINGS

Landscape Arch. GC	Date AUG. 2014	Drawing No. 1
Grading Drainage	Scale 1:200	
Drawn CR	Director	File No. CD-01-14
Checked	Date	Design File Name loui acc.dgn

Reference File Name(s) loui obs.dgn construct.tbl



Figure 2.6



Plate 2.8. Approximate area of proposed LMRP temporary trail connector, looking south (Jan. 2015).

The trail will cut through an existing planting bed and, thus, will require some site preparation, including relocation of several shrubs from the planting bed; stripping approximately 30 m² of shrub bed mulch and topsoil, and, stockpiling for re-use in nearby sites. Post-construction, all disturbed lands will be returned to their pre-disturbance condition.

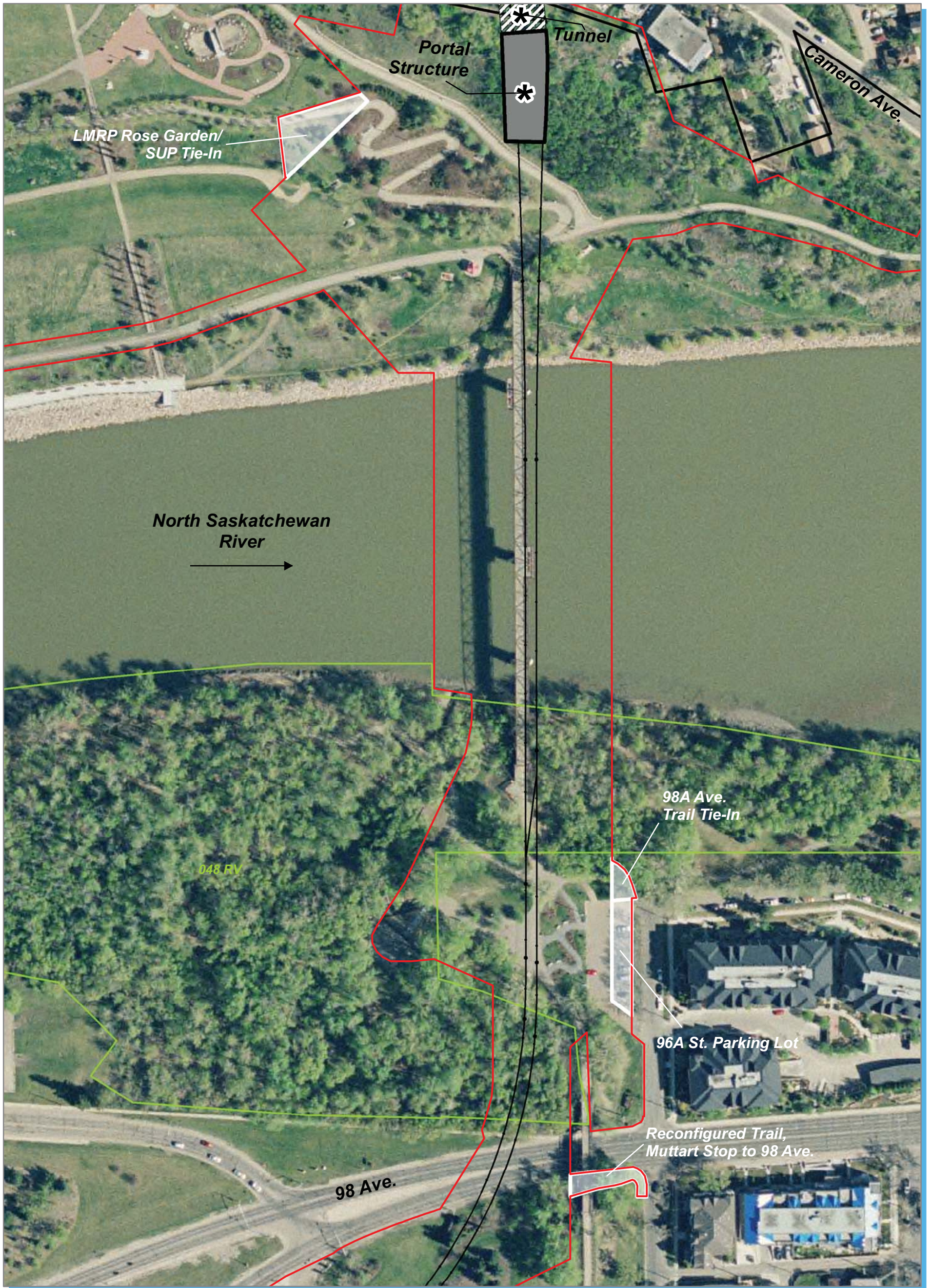
The connector trail will be constructed in late summer 2015, under a contract administered by Community Services. The contract will specify the need to prepare an ECO Plan, address utilities as required, and comply with all City bylaws and relevant environmental guidelines.

2.2 Spatial Clarifications

Figure 2.7 shows the location and relative extent of the four project components requiring spatial clarification. All of the activities associated with each of the four project components will be undertaken by Project Co.

2.2.1 LMRP Rose Garden and SUP Tie-in

As documented in the 2013 EISA, Valley Line construction will result in temporary disturbance to a portion of the “World Walk” SUP and associated Rose Garden in LMRP (Plate 2.9). The 2013 EISA noted that a portion of the Rose Garden was expected to be removed in support of construction and that it would either be restored at its current site



Legend







-  Refinements to Project Co Project Lands
-  Project Area
-  Valley Line LRT Alignment (Reference Design)
-  Bylaw 7188 Boundary
-  City of Edmonton River Valley Natural Areas (2010)
-  Indicative Location Only

Figure 2.7 Spatial Clarifications

City of Edmonton LRT Valley Line - Stage 1
EISA Update

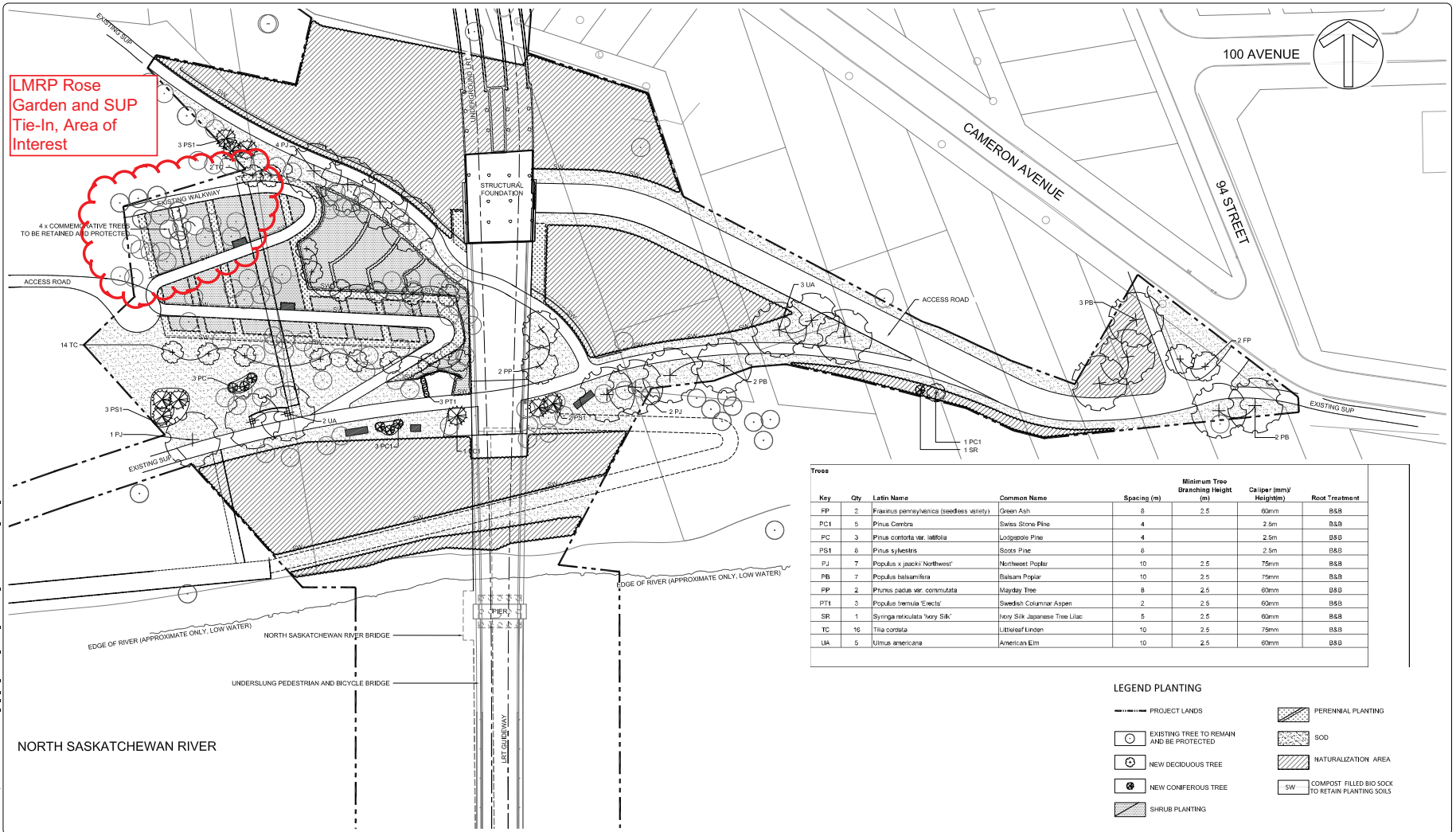
Aerial Photograph Date: May 2012
Date Map Created: 10 February 2015





Plate 2.9. Existing “World Walk” SUP and Rose Garden (June 2014).

following construction, or relocated to a new, permanent site. The 70% River Valley Landscape Drawings and the Project Agreement now in place for the project require Project Co to install a revised Rose Garden within the original Project Area. The drawings also require that the new garden area properly tie-in to the remnant portions of the Rose Garden and SUP situated west of the Project Area (Figure 2.8a). These activities represent a refinement of a mitigation measure committed to in the 2013 EISA; however, the tie-in work requires a slight extension of the Project Area. The project contract documents restrict Project Co activities in this area to landscaping activities only (Figure 2.8b). The total area associated with the tie-in work for the SUP and Rose Garden is approximately 527 m² (Figure 2.7).



LMRP Rose Garden and SUP Tie-In, Area of Interest

Key	Qty	Latin Name	Common Name	Spacing (m)	Minimum Tree Branching Height (m)	Caliper (mm)/Height(m)	Root Treatment
FP	2	Fraxinus pennsylvanica (seedless variety)	Green Ash	8	2.5	60mm	B&B
PCI	5	Pinus Cambra	Swiss Stone Pine	4		2.5m	B&B
PC	3	Pinus contorta var. latifolia	Lodgepole Pine	4		2.5m	B&B
PS1	8	Pinus sylvestrus	Scots Pine	8		2.5m	B&B
PJ	7	Populus x jaekii 'Northwest'	Northwest Poplar	10	2.5	75mm	B&B
PB	7	Populus balsamifera	Balsam Poplar	10	2.5	75mm	B&B
PP	2	Prunus padus var. comutata	Mayday Tree	8	2.5	60mm	B&B
PT1	3	Populus tremula 'Erecta'	Swedish Columnar Aspen	2	2.5	60mm	B&B
SR	1	Syringa reticulata 'Ivory Silk'	Ivory Silk Japanese Tree Lilac	5	2.5	60mm	B&B
TC	16	Tilia cordata	Littleleaf Linden	10	2.5	75mm	B&B
UA	5	Ulmus americana	American Elm	10	2.5	60mm	B&B

LEGEND PLANTING

- PROJECT LANDS
- EXISTING TREE TO REMAIN AND BE PROTECTED
- NEW DECIDUOUS TREE
- NEW CONIFEROUS TREE
- SHRUB PLANTING
- PERENNIAL PLANTING
- SOD
- NATURALIZATION AREA
- COMPOST FILLED BIO SOCK TO RETAIN PLANTING SOILS

no.	description	date	checked
A	ISSUED FOR 70%	22-08-14	J.S.

AECOM
Consultant

A1 bar scale
1:500

drawn by B.N./K.V.
checked by L.K.

designed by B.N./L.K.
date 10-12-13

permit

consultant job no 13369

seal
The Alberta Association of Landscape Architects
Jeff Schurek

AECOM
Prime Consultant

Edmonton
TRANSPORTATION SERVICES

prime consultant job no 60222337

Hatch Mott MacDonald

PRELIMINARY ENGINEERING DRAWINGS
NOT FOR CONSTRUCTION

prime consultant reviewed by M. PERRY

ISI Engineering and Land Services

DIALOG

gpc architecture

drawing title
RIVER VALLEY LANDSCAPE DRAWINGS
LOUISE MCKINNEY PARK
TREE PLANTING

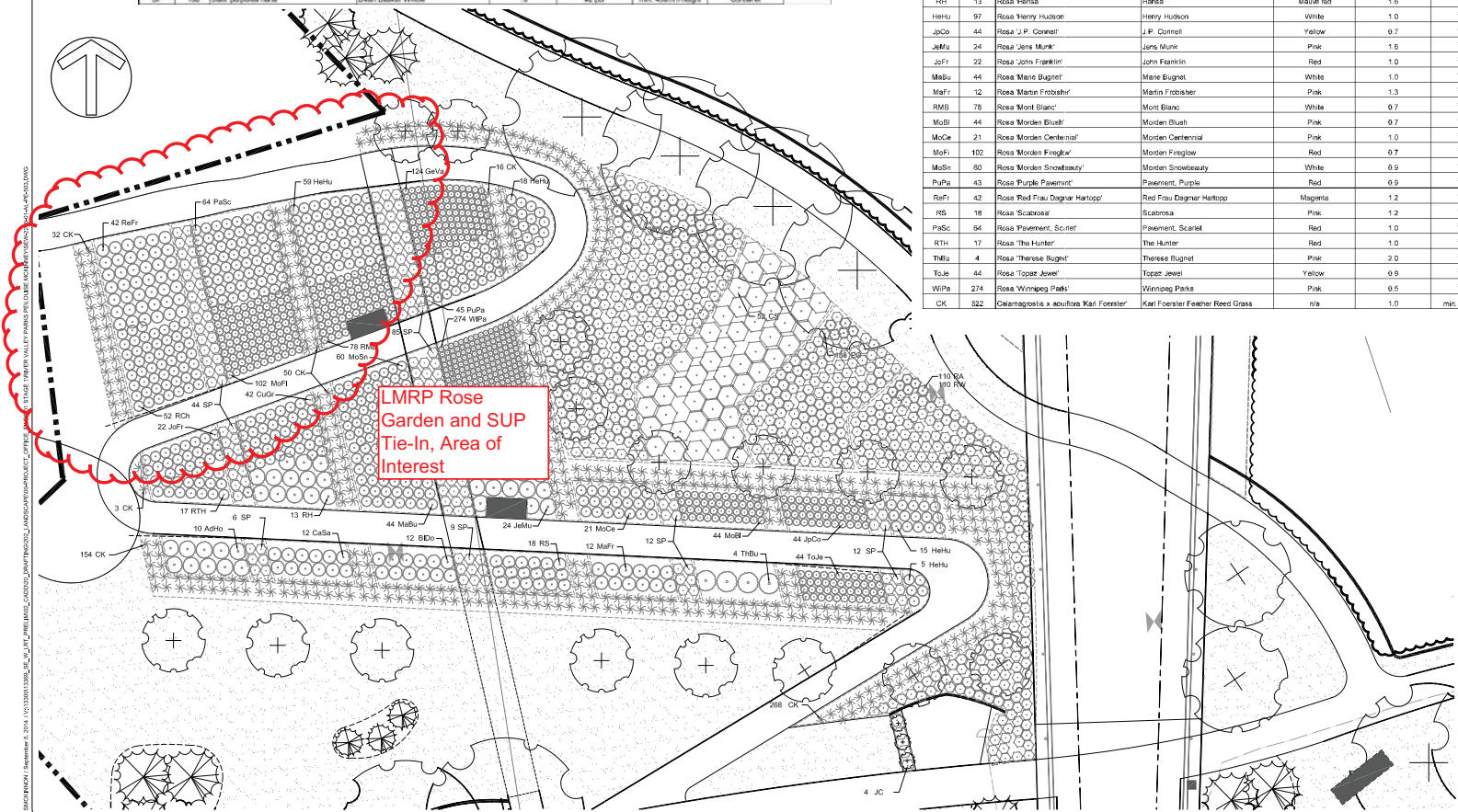
SE to W LRT
MILL WOODS TO LEWIS FARMS

drawing no. SEW-2200-01-AL-PE-504
REV 0
SHT

Figure 2.8a

Key	Qty	Latin Name	Common Name	Spacing (m)	Plant Age / Container Size	Height/Spread at Planting (mm)	Root Treatment
CA	300	<i>Comus alba 'Siberica'</i>	Siberian Corn Dogwood	.0	#2 pot	min 450mm height	Container
CS	52	<i>Comus selcova 'Flammula'</i>	Golden Yag Dogwood	2.0	#2 pot	min 450mm height	Container
JC	4	<i>Juniperus communis 'Alpine Carpet'</i>	Alpine Carpet Juniper	1.2 (min)	#2 pot	min 300mm spread	Container
PD	138	<i>Physocarpus opulifolius 'Dart's Gold'</i>	Dart's Gold Ninebark	.0	#2 pot	min 450mm height	Container
RA	110	<i>Rosa acicularis</i>	Prickly Wild Rose	.0	#2 pot	min 450mm height	Container
RW	110	<i>Rosa woodii</i>	Wood's Rose	.0	#2 pot	min 450mm height	Container
SP	188	<i>Salix purpurea nana</i>	Dwarf Basket Willow	.0	#2 pot	min 450mm height	Container

Key	Qty	Latin Name	Common Name	Colour	Spacing (m)	Plant Age / Container Size	Height/Spread at Planting (mm)	Root Treatment
AdHo	10	<i>Rosa 'Avalanche Hoopcees'</i>	Avalanche Hoodcees	Red	1.6	# 2 pot	n/a	Container
BlDo	12	<i>Rosa 'Blanc Double de Coulbert'</i>	Blanc Double de Coulbert	White	1.3	# 2 pot	n/a	Container
CaSa	12	<i>Rosa 'Captain Samuel Holland'</i>	Captain Samuel Holland	Red	1.3	# 2 pot	n/a	Container
RCh	52	<i>Rosa 'Champlain'</i>	Champlain	Red	1.0	# 2 pot	n/a	Container
ClGr	42	<i>Rosa 'Cuthbert Grant'</i>	Cuthbert Grant	Red	1.0	# 2 pot	n/a	Container
GeVa	124	<i>Rosa 'George Vancouver Rose'</i>	George Vancouver Rose	Red	0.6	# 2 pot	n/a	Container
RH	13	<i>Rosa 'Hansa'</i>	Hansa	Mauve red	1.6	# 2 pot	n/a	Container
HeHu	97	<i>Rosa 'Henry Hudson'</i>	Henry Hudson	White	1.0	# 2 pot	n/a	Container
JoCo	44	<i>Rosa 'J.P. Connell'</i>	J.P. Connell	Yellow	0.7	# 2 pot	n/a	Container
JeMu	24	<i>Rosa 'Jens Munk'</i>	Jens Munk	Pink	1.6	# 2 pot	n/a	Container
JoFr	22	<i>Rosa 'John Franklin'</i>	John Franklin	Red	1.0	# 2 pot	n/a	Container
MaBu	44	<i>Rosa 'Marie Bugnet'</i>	Marie Bugnet	White	1.0	# 2 pot	n/a	Container
MaFr	12	<i>Rosa 'Martin Frobisher'</i>	Martin Frobisher	Pink	1.3	# 2 pot	n/a	Container
MoBl	78	<i>Rosa 'Mont Blanc'</i>	Mont Blanc	White	0.7	# 2 pot	n/a	Container
MoBl	44	<i>Rosa 'Morden Bluefi'</i>	Morden Bluefi	Pink	0.7	# 2 pot	n/a	Container
MoCe	21	<i>Rosa 'Morden Centennial'</i>	Morden Centennial	Pink	1.0	# 2 pot	n/a	Container
MoFi	102	<i>Rosa 'Morden Fireglow'</i>	Morden Fireglow	Red	0.7	# 2 pot	n/a	Container
MoSn	60	<i>Rosa 'Morden Snowblossom'</i>	Morden Snowblossom	White	0.9	# 2 pot	n/a	Container
PuPa	43	<i>Rosa 'Purple Pavement'</i>	Pavement, Purple	Red	0.9	# 2 pot	n/a	Container
ReFr	42	<i>Rosa 'Red Frau Dagmar Hartopp'</i>	Red Frau Dagmar Hartopp	Magenta	1.2	# 2 pot	n/a	Container
RS	18	<i>Rosa 'Scabrosa'</i>	Scabrosa	Pink	1.2	# 2 pot	n/a	Container
PaSc	64	<i>Rosa 'Pavement, Scarlet'</i>	Pavement, Scarlet	Red	1.0	# 2 pot	n/a	Container
RtH	17	<i>Rosa 'The Hunter'</i>	The Hunter	Red	1.0	# 2 pot	n/a	Container
ThBu	4	<i>Rosa 'Theresa Bugnet'</i>	Theresa Bugnet	Pink	2.0	# 2 pot	n/a	Container
ToJe	44	<i>Rosa 'Topaz Jewel'</i>	Topaz Jewel	Yellow	0.9	# 2 pot	n/a	Container
WiPa	274	<i>Rosa 'Winchegg Park'</i>	Winchegg Park	Pink	0.5	# 2 pot	n/a	Container
CK	522	<i>Chamaecrista x acutiflora 'Karl Foerster'</i>	Karl Foerster Feather Reed Grass	n/a	1.0	min. 2 yill pot	n/a	Container



LMRP Rose Garden and SUP Tie-In, Area of Interest

LEGEND PLANTING - ROSE GARDEN

- PERENNIAL PLANTING
- ROSE PLANTING
- SHRUB PLANTING
- SOD
- PROJECT LANDS
- DELIMITATION OF PLANTING TYPE

no.	description	date	checked

AECOM Consultant

A1 bar scale 0 2 4 6 8 10m
1:200

drawn by B.N./K.V. designed by B.N./L.K.
checked by L.K. date 14-11-13

permit

seal

The Alberta Association of Landscape Architects
Jeff Schurek
22/08/2014

AECOM Prime Consultant

Edmonton TRANSPORTATION SERVICES

consultant reviewed by J. SCHUREK
prime consultant job no 60222337

Hatch Mott MacDonald

PRELIMINARY ENGINEERING DRAWINGS
NOT FOR CONSTRUCTION

prime consultant reviewed by M. PERRY

ISI Engineering and Land Services

DIALOG **gec architecture**

drawing title
RIVER VALLEY LANDSCAPE DRAWINGS
LOUISE MCKINNEY PARK
SHRUB AND PERENNIAL PLANTING

SE to W LRT
MILL WOODS TO LEWIS FARMS

drawing no. SEW-2200-01-AL-PE-503
REV 0
SHT

Figure 2.8b

2.2.2 98A Avenue Trail Tie-in to SUP

The 2013 EISA noted that LRT construction will disrupt portions of trails situated in HMEP in the vicinity of the south end of the new Tawatina Bridge crossing the NSR. It acknowledged the need to redevelop that area of the park and committed to providing a seamless tie-in to adjacent existing trails. During development of the 70% River Valley Landscape Drawings it became evident that the full area required for this work, particularly to appropriately tie-in to the existing east-west SUP at the north end of the HMEP parking lot, near 98A Avenue, was not captured by the 2013 EISA Project Area (Figure 2.9) (Plate 2.10, 2.11). This area has now been captured by both the landscape drawings that guide Project Co and by the revised Project Area boundary (Figure 2.7). The work area for this SUP tie-in will total 108 m² (Figure 2.9). Valley Line contract documents include specifications that limit Project Co work in this area to the work described in the landscape drawings; the added area will not be permitted to function as a general construction area.



Plate 2.10. Site of trail tie-in work required at HMEP and 98A Avenue, behind the no-stopping sign, see in the foreground (Jan. 2015).

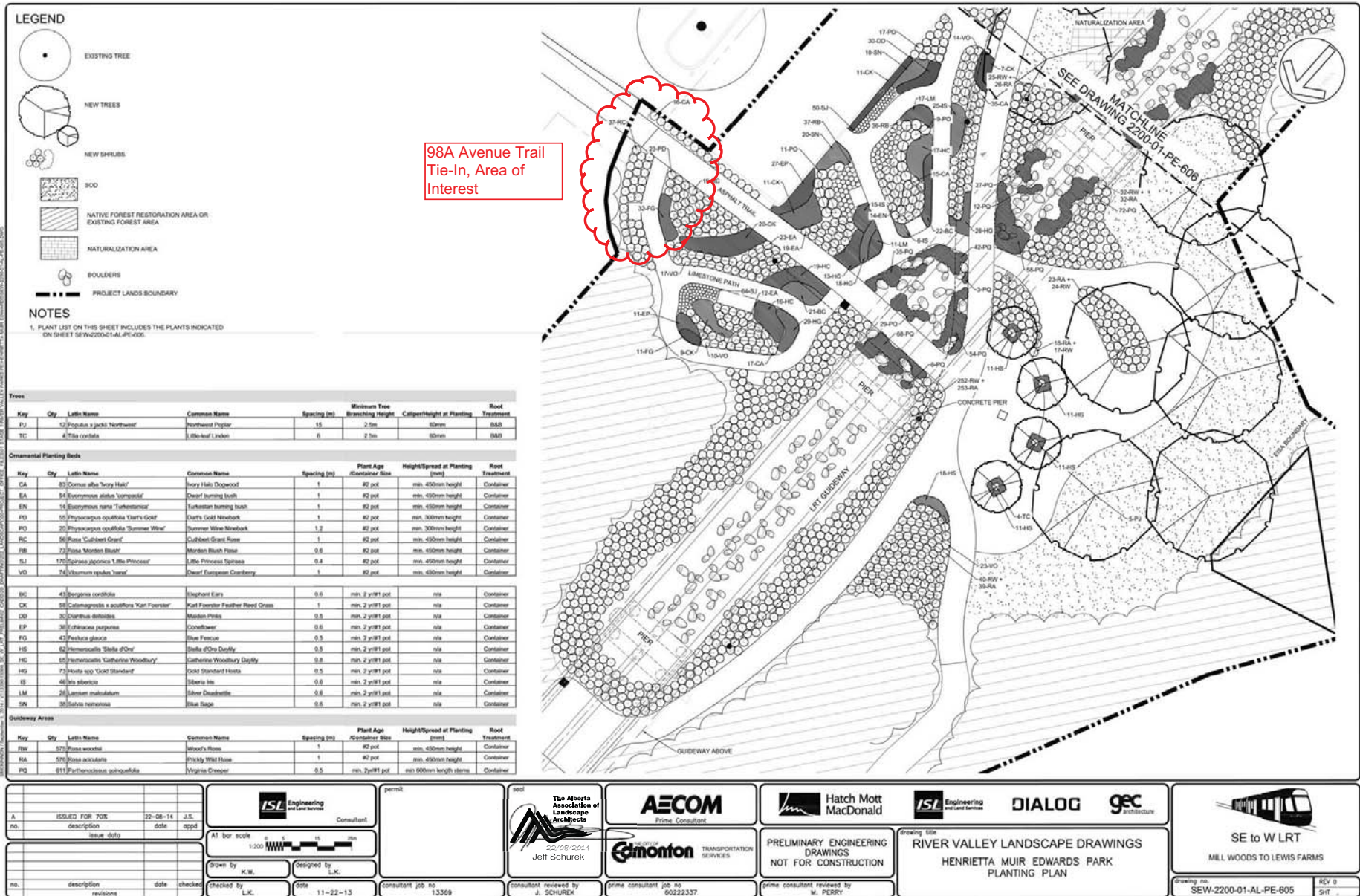


Figure 2.9



Plate 2.11. Site of trail tie-in work required at HMEP and 98A Avenue, looking north from within HMEP (April 2013).

2.2.3 Reconfigured Trail, Muttart Stop to 98 Avenue

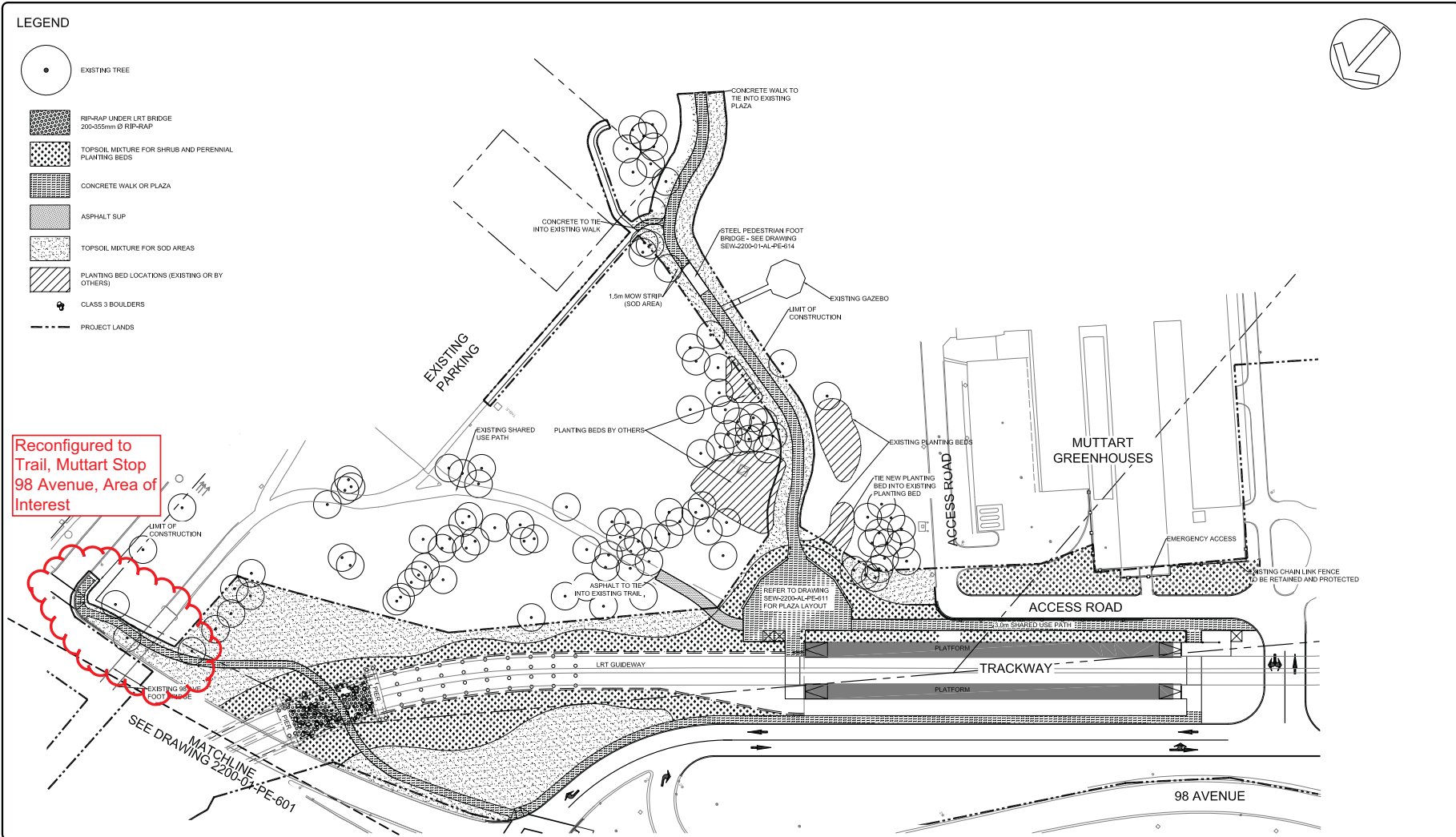
The 2013 EISA describes LRT work required in the vicinity of the Muttart Conservatory and the Muttart Stop as temporarily and adversely affecting river valley trails in the Muttart grounds. Built-in mitigation measures included installation of a new entrance plaza connecting the Conservatory grounds to the new LRT stop and reconfiguration of trails in that area to provide appropriate access to both north and south bound platforms and the larger local path network, as needed. The trail or pathway connections in this area have now been refined as part of development of the 70% River Valley Landscape Drawings. Those plans show a realigned trail connecting the south (northbound) platform to the Muttart Conservatory grounds and local trail network, and, a new trail connecting the north (southbound) platform to the Muttart grounds and Cloverdale Neighbourhood at 96A Street, thus providing access to the south terminus of the 98 Avenue Pedestrian Bridge. The new trail moves under the bridge to connect with 96A Street. That connection requires a narrow extension of the Project Area in that locality, parallel to 98 Avenue (Figure 2.10; Plate 2.12, 2.13) totaling an additional 227 m². The Valley Line contract includes specifications that limit Project Co work in this area to trail construction only; the area will not be permitted to function as a general construction area.



Plate 2.12: Lands extension for the new tie-in trail south of 98 Avenue, looking east (June 2014).



Plate 2.13: Lands extension for new tie-in trail, south of 98 Avenue, west of 96A Street, looking northwest (June 2014).



Reconfigured to Trail, Muttart Stop 98 Avenue, Area of Interest

no.	description	date	checked

ISL Engineering and Land Services
Consultant

A1 bar scale 0 5 15 25m
1:500

drawn by K.W. designed by L.K.
checked by L.K. date 18-08-14

permit

seal
The Alberta Association of Landscape Architects
22/08/2014
Jeff Schurek

consultant reviewed by J. SCHUREK

AECOM
Prime Consultant

omont TRANSPORTATION SERVICES

prime consultant job no. 60222337

Hatch Mott MacDonald

PRELIMINARY ENGINEERING DRAWINGS
NOT FOR CONSTRUCTION

prime consultant reviewed by M. PERRY

ISL Engineering and Land Services

DIALOG **gec**

drawing title
RIVER VALLEY LANDSCAPE DRAWINGS
MUTTART STOP
SOILS AND MATERIALS PLAN

SE to W LRT
MILL WOODS TO LEWIS FARMS

drawing no. SEW-2200-01-AL-PE-608 REV 0
SHT

Figure 2.10

2.2.4 96A Street Parking Lot

The 2013 EISA described the temporary loss of a small trailhead parking lot situated in HMEP, immediately west of 96A Street (Figure 2.4; Plate 2.14). The parking lot was described as within the Project Area and available to Project Co for general construction purposes. Post-construction re-establishment of the parking lot was included in EISA mitigation commitments. While the 2013 EISA narrative identified this small parking lot as part of the Project Area, the Project Area boundary presented in that report included only the western half of the parking lot. As the full parking lot would necessarily be affected during parking lot re-establishment, the Project Area boundary has now been shifted approximately 10 m to the east to include the entire parking lot, adding 364 m² to the Project Area. As had been intended all along, the full parking lot will be available to Project Co for general construction activities.



Plate 2.14: Trailhead parking lot at HMEP; lands will include up to the far side of the treed median shown mid-photograph.