

An aerial photograph of a suburban residential area. In the upper left, there is a large green golf course. The rest of the image shows a dense residential neighborhood with many houses, streets, and trees. A winding road is visible on the right side. A semi-transparent blue rectangle is overlaid on the left side of the image, containing the title and other text.

Design and Construction Standards

2022 Volume 5 Landscape

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INTENT OF USE

This volume was developed for establishing standards and guidelines for the City of Edmonton expectations in the design and construction of landscape and open space assets. The greatest care has been taken to confirm the accuracy of the information contained herein, any foreseen errors should be brought to the attention of the City. The views expressed herein do not represent those of any individual contributor, the content is developed and reviewed with a committee and not published until a consensus is reached. Landscape and related asset design continually evolve, and practices change and improve over time, so it is necessary to regularly consult relevant technical standards, codes, and other publications rather than relying on this publication exclusively. The City of Edmonton, authors, and members of the review committee, want to convey that this document does not constitute a project specific design. As such, no part of this guideline alleviates the responsibility of the professionals retained to design and construct specific projects from taking full responsibility and authenticating their designs as required in accordance with AALA, APEGA, AAA, Alberta Building Code, and any other statutory or safety requirements.

Any Standard Drawings, Details, or specifications are provided to convey the City's typically ideal general arrangement and requirements. Representations may not be to scale, they may be substantially schematic in nature and/or require further elaboration and development. As such those documents are not suitable for integration into a specific implementation without review and modification and are only intended for use by a competent designer exercising professional judgment. The designer shall modify and supplement as necessary to provide a complete, properly functioning, design that conforms in all respects to the City's functional requirements. When actualized in a particular implementation it is the designer's responsibility to ensure the size, location, and spacing of all elements, and all components/specifications, are suitable and safe for the use and location intended, and any applicable code, legislative, and authority requirements are adhered to. In addition any accessibility, operational and maintenance requirements must be met. Deviations from the represented nominal design parameters, questions of intent or accuracy, or any other apparent conflicts, shall be reconciled with an appropriate City representative. When employing any aspect of these documents, the ultimately responsible professional designer shall remove any authentication of the original author(s), note any provenance as appropriate, and apply their own authentication as required.

<i>Professional Work Product (PWP) Responsibility Matrix</i>	<i>Authenticator (Seal)</i>
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VER	Date	Revision Summary
02	2021-12-21	Added Authentication and Intent of Use
01	2021-03-01	Original Issue

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1. Design Standards Intent

1.1 Intent

The intent of the Landscaping Design and Construction Standards is to ensure that landscape developments on City lands provide well-constructed, functional, aesthetically pleasing, and sustainable public open space. Creativity and innovation are encouraged. The landscape must take into account the maintenance standards the City of Edmonton adheres to.

1.2 Changes to City Standards, Groups, Sections, or Departments

Over time, the name and functions of City groups, sections, or departments may change. When these Standards reference a specific City group, section, or department, if changes have been made that make that section, group, or department obsolete, or has changed its function, or has changed its name, the Developer, Consultant, or Contractor, as applicable, must connect with the current equivalent group, section, or department and fulfil the obligations as required by the City. Similarly, when this Volume 5 references another Volume of the City of Edmonton Design and Construction Standards, if changes have been made to that section in that Volume referenced, the equivalent section in that Volume shall apply.

1.3 Proposed Alternatives to the Standards

- 1.3.1 Developers, Consultants, and Contractors are encouraged to continuously seek new and better solutions. Where a variation to the standards could achieve a better technical and economical result a proposal should be presented for acceptance by the City. If the Developer, Consultant, or Contractor wishes to apply methods which differ from a standard or specification in this document, or if these standards or specifications do not cover a subject of concern to a specific design, or if it is proposed to use materials not approved in this document, then the responsibility shall be upon the Developer, Consultant, and/or Contractor, as applicable, to justify the proposal or resolve the concern to the satisfaction of the City.
- 1.3.2 The Developer, Consultant, and/or Contractor, as applicable, shall present the alternatives for resolution of the concern to Parks and shall make a recommendation on the proposed standard or material to be used, with justifications in terms of implementation feasibility and economic, engineering, environmental, operational and maintenance criteria, and submit a Change Request form available in Appendix C.
- 1.3.3 Notwithstanding the review of these alternatives by Parks and the acceptance by Parks of the proposed alternatives, the Developer and the Consultant remain fully responsible for the design and construction of the municipal improvements according to good landscaping practice adequate to address the specific needs and site conditions.

1.4 Amendments to Legislation and Bylaws

Over time, amendments to acts, regulations, or bylaws may occur. When these Standards reference a specific act, regulation, or bylaw, these Standards are deemed to reference the act, regulation, or bylaw as amended.

2. Roll Out Procedure

2.1 Developer and Other Projects

- 2.1.1 Design, drafting and construction requirements from this Design and Construction Standards, Volume 5: Landscaping are applicable to all projects that are initiated into circulation as of April 1, 2021.
- 2.1.2 Projects initiated into circulation prior April 1, 2021, are subject to the design and drafting requirements outlined in the Landscaping Standards that were applicable during the period the project was initiated.
- 2.1.3 A project is considered initiated once the “engineering drawings” (for Developer project) and “tender” (for other projects) have been accepted into first circulation.
- 2.1.4 Trees initially planted prior to April 1, 2021 that require amendment as a result of inspection by disturbing the rootball (replacement, lift, lower or straighten) should be replanted to the current depth requirements.

2.2 Approved Drawing Implementations

- 2.2.1 Redlines and re-lotted or re-staged projects are to adhere to the version of the Standards the project was originally approved under.

3. General Landscape Submission Requirements

3.1 Overall Intent

- 3.1.1 All landscape plans and specifications submitted to the City of Edmonton for approval must meet or exceed all requirements set out in the City of Edmonton’s Design and Construction Standards.

3.2 Reference Documents

- 3.2.1 The following documents are a source of additional information and are referenced as the most recent edition, unless otherwise noted:
 - Canadian Nursery Stock Standard, Canadian Nursery Landscape Association (C.N.L.A);
 - Canadian Landscape Standard;
 - Barrier Free Design Guide (by Alberta Municipal Affairs, Safety Services);
 - Community Standards Bylaw 14600;
 - Edmonton Zoning Bylaw 12800;
 - River Valley Bylaw 7188;
 - Parkland Bylaw 2202;
 - Traffic Bylaw 5590;
 - City of Edmonton Corporate Tree Management Policy C456B;

- City of Edmonton, Trees and Construction;
- City of Edmonton Urban Forest Management Plan;
- City of Edmonton Low Impact Development, Best Management Practices, Design Guide;
- City of Edmonton Low Impact Development, Construction, Inspection & Maintenance Guide;
- City of Edmonton, Winter Design Guidelines: Transforming Edmonton into a Great Winter City;
- The City of Edmonton City Plan;
- City of Edmonton, Dogs in Open Spaces Strategy: A 10-Year Strategy to Guide The Planning, Design and Management of Off Leash Areas in Edmonton;
- City of Edmonton Open Space Policy C594;
- Environmental Impact Assessments (contact City of Edmonton, Sustainable Development);
- CSA Z614 - Children’s Playspaces and Equipment;
- Playspace and Wheeled Sport Facility Design and Construction Standards;
- Urban Parks Management Plan (UPMP);
- City of Edmonton Breathe Plan;
- Weed Control Act;
- Activities associated with or impacting retained natural features must conform with the recommendations provided within the following technical documents:
- Site-specific Natural Area Management Plan (SSNAMP);
- Natural Area Management Plan (NAMP);
- Environmental Screening Report (ESR);
- Environmental Impact Assessment (EIA);
- Initial Project Reviews (IPR);
- Up By Roots, James Urban (Urban, 1992).

3.3 Definitions

- 3.3.1 **As-Built Drawing:** a scaled drawing accurately surveyed and intended to record the post- construction conditions.
- 3.3.2 **The Authority:** any outside agency with jurisdiction over development approval on lands not controlled by the City of Edmonton. For example, ATCO Gas or AltaLink Corporation.
- 3.3.3 **Base Level Development:** as defined in the Breathe Plan by the City of Edmonton Urban Parks Management Plan by the Parkland Classification System. See UPMP in the references section for more details.

- 3.3.4 The **City** may refer to, as appropriate to the context, the City of Edmonton, a Municipal Corporation, and includes all City Departments, as well as EPCOR Water Services Inc., EPCOR Distribution and Transmission Inc., and Drainage Services, EPCOR Utilities Inc., where applicable.
- 3.3.5 **Concept Drawings:** a landscape drawing intended to convey design intent rather than detail. Parks utilizes a four step design drawing process, Concept Drawings, Site Development Drawings, Construction Drawings and As-Built Drawings.
- 3.3.6 **Construction Drawing:** a scaled drawing with sufficient information such as coordinates, construction details, and grading, and planting information to facilitate construction.
- 3.3.7 **Constructed Wetlands:** human-made systems, designed, constructed and operated to emulate natural wetlands or many of their biological processes.
- 3.3.8 **Consultant:** refers to the professional engineer or Landscape Architect, as applicable, responsible for the preparation of designs, reports, studies, engineering or landscape drawings and associated documents and for the execution and implementation of such designs, normally on behalf of a Developer. For any engineering related designs, reports, studies, drawings, or associated documents, the Consultant must hold a valid Permit to Practice, as defined by APEGA, within the Province of Alberta and be registered as an Engineer in good standing with APEGA. For any landscaping designs, reports, studies, drawings, or associated documents, the Consultant must be a member in good standing of the Alberta Association of Landscape Architects. .
- 3.3.9 **Development Officer:** a person specifically delegated by the City as having the authority to approve Development Permit applications, representing Development Services, Sustainable Development.
- 3.3.10 **Developer:** refers to the proponent of a land development proposal, or the Owner as defined in a Servicing Agreement. Requirements of the Developer stated in these standards may, where appropriate, be referred to a consultant, contractor or other agent acting on the Developer's behalf..
- 3.3.11 The **Engineering Drawings** are the plans that set out the scope and detail of the municipal improvements to be provided by the Developer under the terms of the Servicing Agreement and shall refer to or include, where applicable, landscape drawings. The Engineering Drawings must be assembled under cover of a Consultant eligible to practice engineering within the Province of Alberta and registered with APEGA.
- 3.3.12 **Enhanced Site Conditions:** are defined as conditions that promote the health of vegetation including tree trenches, increased soil volume and above base level maintenance practices.
- 3.3.13 **Forestry:** Urban Forestry within Parks and Roads Services, City Operations.
- 3.3.14 **Hard Frost:** four consecutive hours of below four degrees Celsius.
- 3.3.15 **Landscape Architectural Technologist/Parks:** the professional person within
a) Development Inspections, Development Services and b) Open Space Planning

& Design, within Infrastructure Planning and Design, Integrated Infrastructure Services who are responsible for coordinating the inspections, inspecting the landscaping or fencing municipal improvements, and issuance of Landscape Construction Completion Certificates and Final Acceptance Certificates.

- 3.3.16 **Landscape Architect:** refers to the consultant acting normally on behalf of the Developer to coordinate the preparation of all landscape drawings, inspect all on site work and coordinate with the City the issuance of construction completion certificates (C.C.C.s) and final acceptance certificates (F.A.C.s). The Landscape Architect must be a member in good standing of the Alberta Association of Landscape Architects. .
- 3.3.17 **Landscape Technician/Parks:** a Landscape Technician representing Parks within Development Inspections, Subdivision and Development Coordination, Development Services and Open Space Planning & Design, within Infrastructure Planning and Design, Integrated Infrastructure Services.
- 3.3.18 **Low Impact Development (LID):** is a land development and stormwater management approach that works with nature to manage stormwater as close to the source as possible. LID focuses on maintaining and restoring the natural hydrological processes of a site.
- 3.3.19 **Master Plan:** drawings or documents outlining future developments.
- 3.3.20 **Natural Area:** an area of land or water that is dominated by native vegetation in naturally occurring patterns. Such areas could include grasslands, forests, wetlands, peatlands or riparian areas.
- 3.3.21 **Naturalization:** a type of habitat restoration; the deliberate reintroduction of species that are native to a given area or are well adapted to the climate circumstance; activities that are intended to improve and enhance the natural environment and reduce the required operational maintenance. The biodiversity and ecosystem function of a naturalized ecosystem is lower compared to a reference habitat but higher compared to a reclaimed ecosystem.
- 3.3.22 **Normal Water Line:** the normal water level for a stormwater management facility as shown on the Engineering Drawings.
- 3.3.23 **Parks:** Parks includes the Parks and Landscape sections within a) Subdivision and Development Coordination, within Development Services, Urban Form and Corporate Strategic Development b) Open Space Planning & Design, within Building Great Neighbourhoods and Open Spaces, Integrated Infrastructure Services, c) Open Space Infrastructure Delivery, within Building Great Neighbourhoods and Open Spaces, Integrated Infrastructure Services and d) Urban Forestry within Parks and Roads Services, City Operations.
- 3.3.24 **Pesticide:** as defined in the Environmental Protection and Enhancement Act includes “a substance that is intended for use in preventing, destroying, repelling or mitigating any insect, nematode, rodent, predatory animal, parasite, bacteria, fungus, weed or other form of plant or animal life or virus.”

- 3.3.25 **Planner/Parks:** a City Parks Planner representing Parks within City Planning, City of Edmonton or Open Space Planning & Design, within Infrastructure Planning and Design, Integrated Infrastructure Services.
- 3.3.26 **Project Manager/Parks:** a City project manager representing Open Space Planning & Design, within Infrastructure Planning and Design, Integrated Infrastructure Services.
- 3.3.27 **Reclamation:** a type of habitat restoration that aims to stabilize disturbed lands to an ecologically productive use. A reclaimed ecosystem initially has less biodiversity and ecosystem function compared to a reference habitat, and the least compared to other types of habitat restoration.
- 3.3.28 **Red Line Drawings:** refer to changes to the Engineering Drawings that occur after the original approval of the Engineering Drawings. These changes must follow the City’s standard process for Redlines as described in Volume 1: General Design and Construction Standards..
- 3.3.29 **Reference Habitat:** the target ecosystem for restoration of a degraded habitat; the reference habitat may be described from historic or contemporary data sources, or may be physically represented by undisturbed, similar native habitat appropriate for the site conditions of the degraded habitat, and which may be adjacent to the project site or elsewhere in the Natural Region/Subregion. The reference habitat may include multiple sites and sources of information, where appropriate, for a particular habitat restoration project.
- 3.3.30 **Restoration:** a type of habitat restoration; the process of fully re-establishing a target level of ecosystem function and biodiversity to a degraded habitat, as defined by the reference habitat. This includes species composition and vegetation community structure.
- 3.3.31 **R.O.W:** rights-of-ways.
- 3.3.32 The **Servicing Agreement** refers to a contractual agreement between one or more Developers and the City which specifies the contractual obligations and the terms and conditions for the construction and warranty of municipal improvements necessary to service lands approved for development.
- 3.3.33 **Site Development Drawings:** a scaled drawing outlining configuration, materials and grading intent, but lacking detailed construction information such as coordinates, dimensions and spot elevations.
- 3.3.34 **Tree protection:** is the act of protecting or using barriers and other technologies and techniques to prevent or minimize damages or impacts to City Trees in critical root, stem or canopy areas of trees.
- 3.3.35 **Tree Preservation:** is the act of conserving and protecting City Trees from damage, impact or loss.

4. Submission Processes

4.1 General Submission

- 4.1.1 The Landscape Architect is encouraged to contact Parks for preliminary input on concept designs before preparation of construction drawings. These concept drawings are subject to a preliminary circulation to pertinent stakeholders at the discretion of Parks.
- 4.1.2 Site Development Drawings and Master Plans will be circulated and reviewed by Parks as required.
- 4.1.3 The Consultant shall submit to the City landscape plans, construction drawings, details, and specifications stamped and signed by a Landscape Architect. These plans and specifications shall, in the sole opinion of Parks, be complete, accurate and in accordance with the standards presented and referred to in the Design and Construction Standards and Reference Documents.
- 4.1.4 Parks will review drawings and specifications with respect for adherence to the City Design and Construction Standards, but are not responsible for any omissions or errors on, or relating to, these plans. Drawings are subject to approval by Parks.
- 4.1.5 The Landscape Architect must submit landscape plans with all related engineering and architectural drawings as one complete set for each project area. Engineering Drawings submitted without the accompanying landscape plans will not be accepted for review by Parks.
- 4.1.6 Where the Landscape Architect's scope of work includes landscaping on or near high-pressure pipeline crossings or any other major utility corridors, these plans shall be submitted in accordance with the requirements of the Design and Construction Standards. Final approval of plans by the City will be subject to approval by the Utility Authority, as evidenced by signed approved drawings. One copy of the executed Crossing Agreement must be submitted to the City prior to commencement of construction of the landscape improvements.
- 4.1.7 Ensure drawings show all natural areas adjacent to the development and addressing how the development will impact the existing natural area. Drawings must also identify if there will be a change in the hydrology of the site.

4.2 Review Criteria

- 4.2.1 Parks relies on a series of approved guidelines and best practices defining appropriate design standards. During the review process, Parks shall make the final decision regarding landscape designs after consideration of the following:
 - The safety and security of the general public.
 - The functional relationship of the landscape design to existing and proposed utilities, land uses, flood/drainage patterns, including vehicular and pedestrian circulation networks.
 - The proposals are sensitive to the location, size and scale of the space available.
 - The horticultural and ecological components of the design take into consideration factors such as micro-climate, soil conditions, hydrology, slope stabilization,

erosion control, successive plant growth, visual screening and control of pedestrian circulation.

- The maintenance requirements of the proposed landscape design and its suitability for the site.
- The inclusion of barrier free access.
- The protection and preservation of the natural environment, and the enhancement of biodiversity and wildlife habitat.
- Site accessibility for maintenance equipment and crews.
- Consideration shall be taken for visual interest, wind blocking and shadow casting in winter.
- The proposals address four season design and use, ensuring that any gathering spaces work well in both winter and summer seasons.

4.3 Landscape Architect's Responsibilities

4.3.1 The Landscape Architect is responsible for all design work, construction detailing, stamping and signing of landscape plans, on-site inspection, submission of required information and As-Built Drawings.

4.3.2 The respective utility company must be contacted for R.O.W. landscape restrictions.

4.3.3 The following list provides an outline of the Landscape Architect's responsibilities including:

- Providing a copy of the approved construction plans at on-site meetings with Parks personnel, and for inspections.
- Submission of one copy of any Utility Crossing Agreement before construction.
- Coordination of natural stand pre-construction, valuation, fire risk, and hazard tree assessments with Development Inspections or Forestry at the City prior to commencement of any proposed work or acceptance for Parks inventory, as required.
- Identify hazard trees and mitigation plan(s).
- Drawings must show all natural areas adjacent to the development and address how the development will impact the existing natural area. Drawings must also identify if there will be a change in the hydrology of the site.
- Resubmission of drawings for review by Parks, as required.
- Resubmission of revised drawings including a detailed explanation of how each of Parks concerns/comments have been addressed.
- Where revisions to previously signed and approved drawings are necessary, submission of a Red Line drawing for review and approval by Parks.
- Conducting site assessments prior to design work to determine retention or modifications to existing site features (e.g. trees).

- Undertaking site monitoring during construction and submit required documentation of materials and construction practices in accordance with the approved drawings. Note that, among others, Specifications 02910 Topsoil, 02914 Mulches, 02920 Seed and Sod, 02930 Trees, Shrubs and Groundcovers, and 02931 Naturalization have specific requirements and/or documentation for inspections.
- Staking or approval of locations of all plant material, landscape structures and site amenities with the contractor prior to installation, to ensure that there are no utility conflicts and confirm conformity to the approved landscape plans.
- Inspection and approval of the final installation of all work; structures, amenities and plant material before applying for and coordinating a CCC or FAC inspection.
- Submission of one As-Built drawing as specified in Section 5.10 As-Built Drawings.

4.4 Tree Preservation Plan

- 4.4.1 A Tree Preservation Plan may be required at the discretion of Parks, depending on the potential impacts to trees designated for retention by the City adjacent to the development or within 5 metres of construction activities.

4.5 Development Permit Landscape Plan Approval Process

- 4.5.1 In the event the Development Officer requires a landscape plan to meet the approval of Parks, or if ground disturbance, seed, sod or plant materials are proposed for City owned lands, the process outlined below must be followed.
- 4.5.2 The Consultant/Developer shall submit four printed sets and an electronic version of landscape drawings, stamped and sealed by a Landscape Architect to The City of Edmonton, Development Services.
- 4.5.3 The Landscape Architect shall submit a cover letter to accompany the four sets of drawings which shall include the following:
- Anticipated time of construction.
 - Indicated that all improvements proposed on City owned lands will be funded by the Developer.
 - Construction and implementation of landscape improvements and landscape rehabilitation to be managed and completed by the Developer.
 - Maintenance of all landscape improvements shall be the Developer's responsibility as specified in the Edmonton Zoning Bylaw 12800.
- 4.5.4 Notify Landscape Architectural Technologist and the Landscape Technician/Parks in writing when work is completed and that inspections are required.
- 4.5.5 The Landscape Architect shall adhere to all City requirements for landscape plans, including the Design and Construction Standards.
- 4.5.6 The Landscape Architect is responsible for design drawing circulation to the City departments and Utility Authority as may be required for review and comment. Copies of all comments are to be provided to the Parks prior to drawing revision.

4.5.7 The Landscape Architect shall submit the revised landscape plans to the appropriate City departments for signed approval.

4.5.8 The Landscape Architect shall then submit the approved City signed landscape plans complete with an electronic copy to the City of Edmonton Development Officer.

4.6 Construction Completion Certificate (CCC) Process

4.6.1 Inspections for Landscape Construction Completion Certificates (CCC) will be undertaken by Parks from June 1st - October 15th, based on snow coverage and weather dependent. Snow accumulation of greater than 5 cm in the last 2 weeks of the season will result in the cancellation of the season and/or daytime temperatures below 0 degrees until the end of the season.

- Projects out of Development Inspections Unit's scope will include a City Operations inspector.
- Development Inspections Unit's may include Parks Operations, Forestry, Ecology, or other Edmonton representatives as required to complete the inspection.

4.6.2 Inspections for Landscape Amenities and Fencing will be conducted throughout the year, based on snow coverage and weather dependent.

- Minor touch up of fencing stain is a seasonal deficiency that must be completed prior to June 30th of the following inspection season, at the inspector's discretion.

4.6.3 The Landscape Architectural Technologist/Parks shall co-ordinate CCC inspection time and date with the Landscape Architect.

4.6.4 The Landscape Architect shall submit the following documents to Eplan: A pre-inspection report, the latest City signed approved drawings and/or Red Lines (highlighted to identify the scope of inspection, matching the specified improvement within the servicing agreement, and in a single PDF document) and a maintenance schedule for landscaping improvements.

- City assets that only require a CCC will require the following documents to be submitted at the time of CCC application: the latest approved landscape drawings (PDF and AutoCAD), maintenance log and a Tangible Capital Asset form.

4.6.5 During CCC re-inspection, whenever possible, the original inspector shall be used for subsequent inspections. If not available, the deficiencies identified on the original inspection report will be used to determine the scope of the re-inspection (unless there are new deficiencies that occurred between the initial inspection and reinspection, create a safety issue or are significant in nature identified in the re-inspection).

4.6.6 On-site inspection shall be initiated by Parks within thirty days of receipt of Parks Pre-Screen approval.

4.6.7 On the date of the site inspection, the Landscape Architectural Technologist/Parks or designate(s), will meet the Landscape Architect at the pre-arranged location.

4.6.8 The Landscape Architect will bring one set of the most recently approved landscape drawings and will record deficiencies during the inspection, as will the

Landscape Architectural Technologist/Parks. The Landscape Architect will send their recorded deficiencies to the Landscape Architectural Technologist/Parks, and the two sets will be compared to ensure consistency for the recorded deficiencies.

4.6.9 The Landscape Architectural Technologist/Parks or Project Manager will supply a CCC deficiency report within two weeks of the inspection to the Landscape Architect.

- Within two weeks of receiving the deficiency report, identified site deficiencies must be corrected.
- If the identified deficiencies have not been corrected within the two week time frame the site will be rejected.

4.6.10 Bank stabilization inspection of plant material requirements must be inspected by Parks to ensure plant material is viable and as per the drawing. Bank Stabilization methods should consider bioengineering and landscape naturalization methods suitable for site context and conditions.

4.7 Inspection of Environmental Reserves

4.7.1 Environmental Reserves shall be inspected to ensure that they are left in their natural state. The inspection will review the following requirements:

- There is no stockpiling on the site;
- There is no dumping on the site;
- Weeds must be controlled as per the Alberta Weed Control Act;
- The site is in compliance with the site's Natural Area Management Plan; and,
- The site is left in an intended state that meets the City's satisfaction.

4.8 Inspection of Municipal Reserves

4.8.1 Municipal Reserves shall be inspected to ensure that they are left in their intended state. The inspection will review the following requirements:

- There is no stockpiling on the site;
- There is no dumping on the site;
- Weeds must be controlled as per the Alberta Weed Control Act;
- The site is in compliance with the site's Natural Area Management Plan; and,
- The site is left in an intended state that meets the City's satisfaction.

4.8.2 Municipal Reserves and ER Reserves that only require a Construction Completion Certificate (CCC) shall require the documents listed in 4.6.4.

4.9 Warranty Period

4.9.1 The Developer shall be responsible for any defect or deficiency in the completed work for a minimum warranty period as outlined in the signed Servicing Agreement, or as identified below. Deficiencies shall be corrected at the Developer's expense.

4.9.2 All landscape improvements shall be maintained for a minimum warranty period of twelve months after issuance of CCC. The warranty period will be extended for an additional twelve months (at time of FAC inspection) when the following conditions apply:

- For sites with more than 40 trees, where 10% or more of the tree rootballs have been or are required to be disturbed (lift, lower, straighten, etc) or where 10% or more are required to be replaced within the current year.
- For sites with 40 trees or less, where 25% or more of the tree rootballs have been or are required to be disturbed (lift, lower, straighten, etc) or where 25% or more are required to be replaced within the current year.
- For sites with 25 shrubs or less, where 50% or more of the total shrubs have not established.
- For sites with more than 25 shrubs, where 25% or more of the total shrubs have not established.
- For sites where 10% or more of the turf has not established.

At which time a new FAC application will be required.

4.9.3 If a pest(s) or disease(s) is found in a tree and that tree requires replacement, that tree cannot be replaced with the same tree species unless approval by the City is given.

4.9.4 If trees that are planted are selected from the trial list, reference Appendix E Tree Diversity Guidelines and Approved Species Spread and Spacing, then the following conditions apply at FAC:

- Trees must be identified as such on the submitted plans;
- In a non-roadway setting no replacements would be required on trees planted above and beyond the required numbers if the remaining landscaping allows for the vacancies as per the discretion of the City inspectors;
- 35% mortality during the maintenance period will be acceptable on the trial species;
 - Trial species are acceptable with up to 30% dieback;
- For the non-trial species the 10% mortality criteria will apply;
- The specified trial species would need to be replaced at least once during the maintenance period before initiating a species change; and,
- All boulevard trees that require replacement must be replaced.

4.9.5 All deciduous trees specified at 80mm* caliper, or greater, to a maximum of 90mm caliper, require a minimum twenty four month warranty period. If planted in a site which has enhanced site conditions such as continuous root trench, a twelve month warranty period will be required.

- * Trees planted at 80mm caliper or above, without enhanced site conditions (tree trenching, increased soil volumes, etc.) will require a twenty four month warranty period.
- 4.9.6 If at the time of inspection trees are determined to have been planted over sized (more than 20mm caliper) above specification as identified on the approved drawings, the City has the right to reject the trees or the minimum warranty period will be extended as outlined in clause 4.9.2.
- 4.9.7 All amenities shall be maintained for a minimum warranty period of twelve (12) months. (i.e. benches, litter/recycling receptacles, etc.) The litter receptacles must be emptied to the City of Edmonton standards until FAC. Contact information shall be provided by the Developer until FAC.
- 4.9.8 All Parks fencing (i.e. metal, chain link, wood screen, and post and rail fencing), shall be maintained as outlined in the Servicing Agreement.
- 4.9.9 The warranty period shall commence from the indicated inspection date, when the Construction Completion Certificate is approved by the Landscape Architectural Technologist/Landscape Technician/Parks.
- 4.9.10 All natural areas shall be maintained as per the Servicing Agreement and Natural Area Management Plan.

4.10 Maintenance Agreement

- 4.10.1 A Maintenance Agreement between the City and the Home Owner's Association may be required by Parks for elements above base level development, including grade, level, topsoil, and seeding on-site with positive drainage on parkland, at the discretion of Parks.

4.11 Final Acceptance Certificate (FAC) Process

- 4.11.1 Inspections for Final Acceptance Certificates (FAC) will be undertaken by Parks from June 1st - September 30th based on snow coverage and weather dependent. Should a Hard Frost occur in the City of Edmonton, the inspection season will end for caliper trees to be accepted into City inventory. .
- 4.11.2 Inspections for Landscape Amenities and Fencing will be conducted throughout the year, based on snow coverage and weather. Fencing on private property does not require a FAC.
- 4.11.3 Landscaping projects with an FAC anniversary date that falls after August 1st, are eligible for early inspection, on or after August 1st. The Consultant and Contractor must agree to maintain the site (should it be approved) for the remainder of the warranty period.
- 4.11.4 The Landscape Architect shall submit the following documents to Eplan: A pre-inspection report, the latest City signed approved drawings and/or Red Lines (highlighted to identify the scope of inspection, matching the specified improvement within the servicing agreement, and in a single PDF document) and a maintenance log.

- After FAC inspection approval the following documents must be submitted into Eplan: the approved as-built (PDF and AutoCAD), a separated approved as-built drawing showing the year planted for trees in that FAC, a Tangible Capital Asset form, and any other site-specific document as noted by the Landscape Technician/Parks.
 - Documents must be submitted within 30 days after the inspection approval. Failure to do so will result in FAC rejection.
- 4.11.5 The contractor shall provide all maintenance logs for the site between CCC and FAC. This shall include standard maintenance tasks including dates when that maintenance occurred. Logs shall also include pesticide application logs. Replacement tree and shrub planting must be indicated on drawings.
- 4.11.6 On-site inspection shall be initiated by Parks within 30 (thirty) days of receipt of Parks Pre-Screen approval.
- 4.11.7 The Landscape Architectural Technologist/Parks shall co-ordinate FAC inspection time and date with the Landscape Architect.
- 4.11.8 On the date of the site inspection, the Landscape Architectural Technologist/Parks or designate, will meet the Landscape Architect at the pre-arranged location.
- 4.11.9 The Landscape Architect will bring one set of the most recently approved landscape drawings and will record deficiencies during the inspection, as will the Landscape Architectural Technologist/Parks.
- 4.11.10 The Landscape Architectural Technologist/Parks will supply to the Landscape Architect an approved FAC or a rejected FAC with a deficiency report, within two weeks of the inspection.
- 4.11.11 During FAC re-inspection, whenever possible, the original inspector shall be used. If not available, the original inspection report's identified deficiencies will be used to determine the scope of the re-inspection (unless there are new deficiencies identified in the re-inspection).
- 4.11.12 In the event that a FAC application is rejected, all original FAC forms will be returned to the Landscape Architect, and these originals must be resubmitted for all subsequent FAC applications.
- 4.11.13 If the trees are in the third growing season, one tree stake and all guy wires shall be removed.
- 4.11.14 Once an FAC inspection is approved, tree stakes may be requested to be removed by Parks prior to finalization and sign-off of the FAC documentation.
- 4.11.15 Erosion and Sediment control measures may be removed at FAC on public Parkland if the landscape and adjacent properties are fully established, thus eliminating the risk of erosion. Removal of the erosion and sediment control measures is at the discretion of the Landscape Architectural Technologist/Parks.

4.12 Landscape Crossing Procedures for Pipeline Corridors

- 4.12.1 All landscape plans identifying a high-pressure pipeline or any other utility transmission facility, regardless of its proximity to the proposed landscape improvements, must be circulated to the appropriate Authority for review.
- 4.12.2 The Landscape Architect shall ensure all utilities, high pressure, intermediate pressure and low pressure lines are accurately plotted on all landscape plans using the most current information available.
- 4.12.3 The Landscape Architect must contact the Authority to determine the landscape restrictions and/or development limitations on specific pipeline corridors. Upon identification of the restrictions and/or limitations, the Developer will enter into a Crossing Agreement with the Authority. The Landscape Architect must submit a letter to Parks outlining the Authority's site specific restrictions and/or limitations.
- 4.12.4 The Landscape Architect shall ensure that three complete sets of the proposed landscape plans are circulated to the proper Utility and/or Pipeline Authority.
- 4.12.5 Upon receipt of the above outlined letter, reference Section 4.12.3. Parks will amend the landscape requirements for the specific pipeline corridor. Landscape and development requirements may be reduced or waived at the discretion of the Parks.
- 4.12.6 The landscape drawings shall be amended to identify those landscape improvements impacted by the Crossing Agreement. The crossing permit number shall be identified on the plans. Hydrovac soil removal is required to expose high pressure lines and/or hand digging of plant material shall be noted on the plan in bold text.
- 4.12.7 The Landscape Architect shall ensure coordination of the Crossing Agreement between the Developer and the Authority as required.
- 4.12.8 The Developer shall ensure a copy of the signed Crossing Agreement and signed landscape plans are available on-site at all times.
- 4.12.9 The Landscape Architect and Consultant are responsible for ensuring that all aspects of the Crossing Agreement are followed.
- 4.12.10 The Developer shall not commence construction until the appropriate Authorities (e.g. Alberta One Call, Shaw, etc.) have flagged below-grade utilities and the Landscape Architect has approved the location of all landscape improvements.
- 4.12.11 The Developer shall not commence any ground disturbance until all the above conditions have been met.

4.13 Pesticide Notification Requirements

- 4.13.1 A Contractor wishing to apply a pesticide on City property or property that is in the possession of the developer and has not yet received FAC, must first submit a completed Contractor Pesticide Use Notification Form to the appropriate Service Area. This must be sent at least 48 hours (not including weekends and holidays) prior, and be acknowledged by an e-mail confirmation before conducting the treatment. If no response is received within two business days, the contractor may

proceed. Please submit only one site per form. The contractor Pesticide Use Notification form may be found on the [City of Edmonton website](#).

- 4.13.2 Developers shall provide signs indicating that areas have received herbicide treatments wherever there is a potential for public exposure. Reference Appendix D Pesticide Notification Signage Template.

4.14 Environmental Considerations

- 4.14.1 Environmental considerations are an important part of all activities and operations within the City of Edmonton. While performing services and operations working directly for the City of Edmonton, contractors must understand their environmental responsibilities. Contractors include:
- Consultants hired by the City of Edmonton;
 - Any person who is hired by the City to provide Construction, Operation, Maintenance and Service activities; and,
 - Any person who is hired by the City and who operates hired equipment.
- 4.14.2 Prior to starting work, contractors must review and understand the contents of the Contractor's Environmental Responsibilities Package and complete and submit the Contractor's Environmental Responsibilities Acknowledgement Form. The Contractor Environmental Responsibility package along with the form as well as general information about contractor environmental responsibilities may be found on the [City of Edmonton website](#).

5. Landscape Plan Requirements

5.1 General Landscape Plan Requirements

- 5.1.1 All plans shall contain a scale including a bar scale, a north arrow, a key plan and a legend. Where possible, orient north to the top of the drawing.
- 5.1.2 All plans shall contain notes, as required, to clarify all work and responsibilities, such as utility staking, etc.
- 5.1.3 All plans shall illustrate all existing and proposed above and below grade utility alignments and fixtures (such as utility pedestals), fixtures, art installations, monuments, statues, street lights, walkway lights, signage, amenities, catch basins, manholes, high, intermediate and low pressure lines, overhead power lines, pylons, sewers, etc.
- 5.1.4 All plans shall contain notes outlining precautionary requirements such as the necessity for hand digging or notification of Utility Authorities before construction.
- 5.1.5 All required details are to be referenced within the drawing set.

5.2 Landscape Layout Plan

- 5.2.1 The Landscape Layout plan shall be drawn to a recommended scale of 1:500 or larger (such as 1:250) and include the following:

- Subdivision name and file number;
 - Approved neighbourhood name and stage;
 - North arrow, date, scale and bar scale;
 - Pipeline Crossing Agreement numbers;
 - Breakdown of area measurements (i.e. school site, pipeline R.O.W., community league site);
 - Proposed property lines and easements;
 - Designated use of adjacent land parcels and development stages. Identify stages as existing or proposed;
 - Street, walkway and public utility lot names or numbers;
 - All streets, roads and walkway alignments;
 - All existing plant material locations;
 - Ditches, swales and berm locations;
 - Constructed wetlands and wet ponds locations or alignments;
 - Location of naturalization signage; and,
 - Outline of any proposed facilities/structures with access locations shown, within the landscaped area, where Parks will be maintaining.
- 5.2.2 The layout plan must respect driveways and service connections to individual lots.
- 5.2.3 The layout plan shall include all proposed site developments, including, but not limited to: parking, curbs, retaining walls, noise attenuation fences, screen and uniform fences, site furnishings and site amenities (e.g. road islands, entry features, gazebos, sculptures, bridges, playgrounds, signage and planters).
- 5.2.4 The layout plan shall include grading and drainage information as follows:
- Proposed contours at a maximum of 1.0m contour intervals and/or spot elevations;
 - River valley and ravine areas identifying flood line information;
 - Surface and below grade storm discharge locations into the North Saskatchewan River Valley and Ravine System; and,
 - Existing grade information, as required, for quantity take-offs or design evaluation.
- 5.2.5 The Layout Plan shall include existing vegetation located on proposed City-owned lands, including those within the North Saskatchewan River Valley, Ravine System and Natural Areas, and are to include the following:
- Trees and shrubs to be protected as per the City of Edmonton Corporate Tree Management Policy C456B.
 - Detailed tree protection plan and/or drawing(s) for all remaining trees. Include a tree preservation plan for natural areas if work will be occurring within 5 meters.

- Site lay down area(s) and construction access(es) must be identified on all of the plan(s), and must include compaction mitigation methods.
 - Where individual trees are evaluated by Forestry, identify hazard trees for removal.
 - For the above removals and relocations, identification of tree species and appropriate size information including caliper, height/spread is required.
 - Where tree stands are evaluated by Forestry, delineate areas of tree risk mitigation and fire risk mitigation.
 - For tree stands, a general description of the proposed material to be removed including species, size and condition of the stand.
 - Trees to be relocated.
- 5.2.6 The layout plan shall include layout, area (m²), and materials for all surface treatments including, but not limited to:
- Mulched planting beds;
 - Naturalized areas;
 - Restored Areas;
 - Seeded and sodded areas;
 - Restored natural areas;
 - Total area of mown and non-mown turf areas;
 - Hard surface areas; and,
 - Playgrounds.
- 5.2.7 The layout plan shall show the limits of the project area and, if required, shall specify the exact portion of the landscape work to be covered by each landscape plan. Match lines shall be used to match individual sheets identifying a larger project area.

5.3 Stormwater Management Facility Drawing Requirements

- 5.3.1 In addition to the requirements outlined in Section 13, all landscape drawings identifying a Stormwater Management Facility (SWMF) must include, at a minimum, the following:
- Normal water line;
 - 1:5 year flood line;
 - 1:25 year flood line;
 - 1:100 year flood line;
 - High water line;
 - Individual planting bed layouts;
 - Location of naturalization signage; and,

- SWMF planting list.
- 5.3.2 If possible stormwater management drawing should be drawn at a scale that allows trees and shrubs to be shown on the same sheet.
- The SWMF drawings will include an overall landscape plan identifying the planting calculations, surface treatments with areas, boat ramps, mow limits, and identify enlargements with match lines.
 - Each enlargement sheet must include a key plan and a planting list (identifying the individual sheet planting only).
 - Ensure the drawings are laid out and ordered for ease of inspection.
- 5.3.3 Boat ramps are required for all Stormwater Management Facilities; see the City of Edmonton Design and Construction Standards, Volume 3: Drainage for specifics.

5.4 Landscape Planting Plan

- 5.4.1 The Landscape Planting Plan shall be drawn to a scale of 1:500 or larger (such as 1:250).
- 5.4.2 The Planting Plan shall identify existing trees, shrubs, shrub beds, natural areas to be preserved, and proposed relocations of existing trees.
- Where existing trees are identified and used to meet quantity requirements on planting plans, they must be included within the planting requirement calculation table and be subject to CCC and FAC inspection.
- 5.4.3 The Planting Plan shall note minimum planting quantity requirements in tabular form, based on measurements (m²/lineal metre) of individual areas, including, but not limited to, Utility R.O.W's, Walkway R.O.W's, Stormwater Management Facilities, Park Areas, Top of Bank and Roadways.
- 5.4.4 The Planting Plan shall include proposed locations for trees, shrubs, perennials and ground covers, clearly labelled and cross-referenced to the plant list.
- 5.4.5 Tree trenches shall be identified on the planting plan, including the exact locations and all cross sections details.
- 5.4.6 The Planting Plan shall include notes detailing all seed and sod mixes being specified. Seed mix notes shall include standard application rates.
- 5.4.7 Plant material graphic symbols shall represent mature spread and, for ornamental beds, no overlap.
- 5.4.8 Tree symbols are to be drawn at mature spread, as per the recommended tree spacing, reference Appendix E Tree Diversity Guidelines and Approved Species Spread and Spacing
- 5.4.9 All shrubs, trees, and plant material symbols shall be contained within a planting bed, indicating a minimum offset of 500 mm of mulched area for ornamental beds, and appropriate landscape treatment for naturalization beds between the edge of the mature vegetation and the bed edge..

- 5.4.10 Where possible, shrub beds should be designed with tapered or flowing edges for ease of mowing with machines, leaving no uncut grass.
- 5.4.11 The Planting Plan shall include all typical and applicable City planting details, as well as unique planting installations, road island and median cross section planting installation details. These details and cross sections are to be shown at an appropriate scale and cross-referenced to the landscape and engineering drawings, as required.
- 5.4.12 The Planting Plan shall include planting plan enlargements of road islands, entry feature shrub beds or other densely planted areas which require a larger scale to accurately show the proposed planting design. These details are to be shown at an appropriate scale and cross-referenced with the landscaping, engineering and architectural drawings as required, including all above and below grade utility alignments.
- 5.4.13 The Planting Plan shall identify all proposed surface treatments and other applications.
- 5.4.14 Tree offsets from utilities shall be identified on the Planting Plan within a legend and on the tree block with a dotted line. See Volume 1: Table of Offsets of the City of Edmonton Design and Construction Standards for tree design offsets.

[City of Edmonton Design and Construction Standards](#)

5.5 Plant List Requirements

- 5.5.1 For ease of drawing review and on-site construction clarity, Parks requires one plant list for each sheet if more than one sheet of planting plans is required. All landscape planting plans shall include a plant list with the following information:
 - Total quantities of each plant;
 - Common name/variety and botanical name;
 - Root treatment (e.g. balled and burlapped, tree spade, bare root or potted);
 - Plant material height and/or spread at planting;
 - Minimum tree branching height (for streetscape applications only);
 - Minimum caliper/height; and
 - Remarks including special comments or unique installation criteria.
- 5.5.2 A note indicating that metal bar tree stakes are not allowed within 1.0m of an underground electrical trench shall be included.
- 5.5.3 Prior to installation and for City-owned projects, Forestry may inspect local nursery stock for acceptability at the cost of the Contractor. The Contractor shall co-ordinate this optional inspection with Forestry. This inspection is intended for unique situations only and would be conducted at the discretion of Forestry. This inspection would not preclude rejection of plant material on-site.

5.6 Projects of Limited Scope

5.6.1 Projects of limited scope, for example seed or sod only, would not require the full extent of base information summarized above. At the discretion of the Landscape Architect, the Landscape Layout Plan and Landscape Planting Plan may be prepared as one drawing.

5.7 Landscape Construction Details

5.7.1 Typical construction details such as furniture anchor pads, standard furniture, park lighting, screen, uniform and solid fences, sidewalks, curbs, etc. shall be shown at an appropriate scale and cross-referenced with the landscape plans and engineering drawings as required. City of Edmonton standard details are to be used where relevant. Additional project specific details may be requested, and will be reviewed and approved by all affected departments on a project-by-project basis during the drawing circulation process.

5.8 Architectural, Structural, Mechanical and Electrical Plans

5.8.1 Detailed Architectural, Structural, Mechanical and Electrical plans are required by Parks where the proposed facilities will be maintained by the City. These submissions are to be stamped by accredited professionals as required and shall provide the following as required:

- Construction details and specifications;
- Shop drawings;
- Geotechnical analysis; and,
- Other testing, quality control procedures and analysis.

5.8.2 Consultants are to ensure the Architectural, Structural, Mechanical and Electrical drawings for facilities not to be maintained by Parks are reviewed and approved by the City Departments and EPCOR, as applicable, responsible for maintenance.

5.8.3 The Landscape Architect, at the request of other City Departments or Consultants, may be required to include these drawings in conjunction with the landscape plan submission for facilities not maintained by the City.

5.9 As-Built Drawings

5.9.1 The Landscape Architect shall submit one complete set of electronic As-Built drawings (AutoCAD File, which is spatially correct), to Parks, stamped and noted to be compliant with the City's Design and Construction Standards, prior to or included with the FAC application. A FAC will not be issued without the submission of As-Built Drawings as outlined.

5.9.2 As-Built Drawings will identify the following items:

- Changes for planting, grading, staking or construction detailing;
- Tree replacements that took place during the warranty period prior to FAC;
- Important subgrade features not shown on approved drawings and identified through construction; and,
- Major site utility conflicts identified during plant installations.

5.9.3 As-Built Drawings are to accurately reflect the outcome of construction and the most recently approved Red Lines.

5.10 Red Line Drawings

5.10.1 Refer to the City of Edmonton Design and Construction Standards, Volume 1: General, Chapter 1 Section 8.6 Design Revisions after Acceptance, Redline Approval Process, or its equivalent.

6. Landscaping Standards Change Request Process

6.1 Formal Change Request Process

6.1.1 All Change Requests must be submitted on the approved Change Request Form, to the City of Edmonton, City Planning. Reference Appendix C Change Request Form.

6.1.2 All Change Requests are subject to City of Edmonton approval.

6.1.3 Approved Change Requests will be reflected in the yearly revision of the City of Edmonton Design and Construction Standards, Volume 5: Landscaping.

7. Plant Materials

7.1 General Recommendations for Trees

7.1.1 Insects, disease and drought have negatively affected certain tree species. Forestry encourages designs utilizing a diversity of tree species hardy to the Edmonton area to reduce the spread of insects and disease, and to mitigate the potential visual impact of losing one species within a localized area.

7.1.2 Grouping trees within mulched beds is encouraged where practical to improve growth and survival. Reduced tree spacing in group plantings may be considered by Forestry. Individual tree planting remains acceptable. No individual tree shall be planted within 2.5m of a mulched bed.

7.1.3 For spacing and setbacks, refer to the Table of Offsets in Volume 1: General Design and Construction Standards, Section 8.7 of this Volume 5, and Appendix E Tree Diversity Guidelines and Approved Species Spread and Spacing.

7.2 Soil Volume

7.2.1 Enhanced soil volumes are required to increase critical rooting space. Soil volumes should be designed no deeper than 1 meter with increased area to achieve the minimum soil volume requirement. Based on tree size to soil volume relationships (Urban, 1992) the list below is the recommendations for the City of Edmonton.

- Large canopy trees are defined as trees that under normal conditions can support canopies of 74 m² or spread of over 5 meters and require a minimum soil volume of 17 m³.

- Small canopy trees are defined as trees that under normal conditions have a spread of 5 meters and require a minimum soil volume of 11 m³ and under ideal conditions require 17 m³ to reach its full potential.
- Should the design of the area not allow for the minimum required soil volume, please contact Forestry for recommendations.

7.3 Naturalization

7.3.1 The City of Edmonton is moving towards a more naturalized landscape aesthetic. Naturalization and restoration is supported by the City of Edmonton as a means to provide more sustainable landscapes, to enhance biodiversity, to reduce operational expenses, and to provide educational opportunities.

7.3.2 Top of Bank and Utility Corridors

7.3.2.1 Unless otherwise specified in writing by the utility company, all non-programmable grassed areas of major utility corridors shall be naturalized.

7.3.2.2 For Top of Bank areas, all grassed areas between the shared-use path(s) and Environmental Reserve(s) shall be naturalized, notwithstanding any section of Environmental Reserve(s) that is removed or impacted during or due to construction, which shall be Restored to the satisfaction of the City.

7.3.3 Stormwater Management Facilities

7.3.3.1 A minimum of 65% of the total area above the Normal Water Line of any stormwater management facility shall be naturalized. This total area above the Normal Water Line shall exclude areas taken up by a shared-use path(s)/multi-use trail(s) and boat ramp.

7.3.3.2 1.0 m mow strips are required adjacent to each side of shared-use paths/multi-use trails and adjacent to the private property fence lines. These mow strips are not considered naturalized areas and are included in the 35% calculation of non-naturalized areas.

7.3.3.3 If a shared-use path/multi-use trail is installed in a SWMF, the area between the Normal Water Line and shared-use path(s)/multi-trail(s) shall be naturalized up until the mow strip adjacent to the shared-use path(s)/multi-use trail(s).

7.3.3.4 At the design phase, justifiable reasons can be provided to the City to naturalize less than 65% of the area of a SWMF above the Normal Water Line and, at the discretion of the City, these exceptions can be granted on a case by case basis.

7.3.4 Signage on SWMFs

7.3.4.1 The City of Edmonton will provide two signs per SWMF excluding the stakes (sign panels only). It is the responsibility of the Developer to retrieve and install these signs, as well as provide and install the sign stakes, prior to CCC. The Developer must maintain both the

signs and the stakes until an FAC is issued. **Naturalization signage on SWMFs is a requirement for CCC and must be in place, to the satisfaction of the City, prior to CCC approval.**

7.3.4.2 Signage must be provided in all SWMFs as per the following:

Two signs per SWMF;

Signs must be placed at entries/exits to the SWMF;

Signs should be placed such that they are easily readable at eye-level for the general public;

Developer contact information must be included on the nameplate of the sign (sign and nameplate provided by the City) until FAC has been issued; and

If no entries/exits are present signs must be placed in a place clearly visible to the public.

7.3.4.3 Stakes used for signage must be rust-proof, galvanized steel U channels.

7.3.4.4 Signage can be requested by filling out the following Google Form:

[Google Form for Signage Requests](#)

7.3.5 Other Areas

7.3.5.1 Naturalization is not required but recommended in the following areas: non-programmable or low use Municipal Reserves, shrub beds in appropriate areas (e.g. nature parks or parks near natural areas/river valley), low impact development excluding soil cells (e.g. bioswales and rain gardens), Public Utility Lots, arterial roadways, major roadways, industrial roadway boulevards and ditches, arterial medians, and berms.

7.3.5.2 When only one side of the arterial road is being fully constructed, a native, naturalization, or low-mow seed mix is recommended on the other side of the arterial road not being constructed to the ultimate alignment.

7.3.6 Naturalization is prohibited in shrub beds surrounded by manicured turf, unless otherwise directed or approved by the City.

7.3.7 Naturalization is encouraged when it provides ecosystem function (e.g. water filtration and retention, slope stability, wildlife habitat or corridors), where there are no conflicts with other uses, where aesthetically appropriate and maintenance concerns are addressed.

7.3.8 Naturalization or restoration may be required where sites or open areas suitable to be converted to a naturalized landscape are removed or impacted during construction or other activities.

- 7.3.9 Naturalized areas and shrub beds must be set back 5m from playgrounds.
- 7.3.10 Existing natural and restored areas affected by the proposed improvements, which cannot be protected during construction, must be restored with native plant materials having regard for the surrounding environment, new drainage patterns, soil conditions and ecological rehabilitation. Generally, but not limited to, restoration would apply to river valley and ravine lands, natural areas, natural area buffers, major utility and road R.O.W's.
- 7.3.11 The Landscape Architect shall design an appropriate mix of native trees, shrubs, ground covers and wild flower seed mixes to rehabilitate affected areas. See the current Naturalization Master Plan. The Landscape drawings shall identify all plant communities to be established and all other information necessary to implement the proposed landscape improvements. Site characteristics including slope, soil and orientation, and their appropriateness to the site, shall be taken into account when specifying species and size of plant material.
- 7.3.12 The Landscape Architect shall specify all tree, shrub and ground cover sizes. To promote biodiversity and a healthy growing environment, it is recommended that 10% of all plant material, where possible and appropriate, be of larger sizes. Larger material (trees or larger shrubs) shall be at least 40 mm caliper size (deciduous), 2.5 m height (coniferous) and 5 gallon pot size (shrubs).
- 7.3.13 Individually planted trees above 40 mm caliper or 2.5 m height and 5 gallon shrubs will require a mulched ring.
- 7.3.14 Where naturalization planting is use, plant material may be substituted as per the following:

Full Size Tree	Potted Tree	Potted Tree	Shrubs	Trees or Shrubs - Whips & Plugs
(1) 50 mm Cal.	(2) 40 mm Cal.	(5) 20 mm Cal.	(7) 5 Gallon Pot	(25) minimum 100 mm Pot

- A maximum of 10% of the required 50 mm caliper trees on a site may be substituted for smaller material.
- Emergent material does not qualify into the shrub or tree equivalency.
- Example: One 50 mm caliper full size tree can be substituted with either two 40 mm caliper potted trees, or five 20 mm caliper potted trees, or seven 5 gallon pot shrubs or twenty five 100 mm pots (tree or shrubs, whips and plugs).
- 7.3.15 The Landscape Architect shall design any required subsurface drainage, surface drainage and erosion control measures in the restoration area and, if required, coordinate this with other consultants to implement geotechnical, structural and bioengineering principles.
- 7.3.16 Forestry stock, seedlings, deciduous tree whips and propagated/rooted cuttings are acceptable for use from an approved source.

- 7.3.17 All plant materials are to be nursery grown stock, with the exception of native collected plugs and plant material.
- 7.3.18 Collected plant materials may be used with prior approval from Parks. Landscape drawings shall identify areas to be planted with collected material and also indicate the site from where source material has originated.
- 7.3.19 The guide for acceptable levels of naturalization planting (plugs, whips and bare root specimens) survival at FAC shall be 80%, with a minimum density of one plant per square meter. If the density is met, all dead plant material will be removed at FAC.
- 7.3.20 All natural sites (Natural, Naturalized, and Restored areas) must be checked and cleaned of hazards such as old barbed wire fences, abandoned structures, basements and any other objects that may be hazardous to citizens.
- 7.3.21 If the landscape drawings include naturalized grass, these areas will be vigorous, healthy, and naturalized by FAC inspection. Mowing may be completed only to establish plant health and must maintain a minimum height of 100-150 mm during establishment. During grass seed establishment do not cut more than 1/3 of blade height or below 100 mm (whichever is taller) at any one mowing.
- 7.3.22 Grass slopes equal to or greater than 3:1 will be naturalized and not mowed regularly. Newly constructed slopes should be seeded with a naturalized or native seed mix. Reference Specification 02920 Seed and Sod, 2.1.3. Native and Naturalization Seed Mixes.

7.4 Tree and Shrub Planting Setbacks and Spacing

- 7.4.1 See Volume 1: General of the Design and Construction Standards for a list of offsets regarding Landscaping infrastructure in the Table of Offsets. Some supplementary requirements to those offsets are provided in this Section 7 below.
- 7.4.2 Where possible, it is suggested that landscape improvements and plant materials have increased setbacks from underground utilities.
- 7.4.3 There shall be a minimum 5m planting setback for shrub beds, naturalized grasses and trees from play space envelopes (playground equipment and splash parks). See Volume 1 Table of Minimum Offsets for further design offsets.
- 7.4.4 There shall be no excavations undertaken within 1.0 m of any underground utility cables unless:
 - The excavation is done under the control of the operator of the utility system.
 - The excavation method is acceptable as per EPCOR standards and guidelines.
- 7.4.5 In the event that the mechanical tree digging equipment cannot maintain a minimum clearance of 1.0 m from shallow utilities during installation, the pertinent Utility Authority must be contacted for approval and/or safety procedures (e.g. hand digging). Any additional costs incurred will be at the Developer's expense. Drawings are to note that the approval for plantings have been received from the Utility Authority, and identify the plant materials/areas affected. It should be noted that deep utilities require a minimum offset as

referenced in the Table of Offsets in Volume 1: General Design and Construction Standards.

- 7.4.6 The Developer, Contractor, and Consultant must also adhere to the EPCOR Guidelines for Working in Close Proximity to Electrical Equipment, available at: [EPCOR Guidelines for Working in Close Proximity to Electrical Equipment](#)
- 7.4.7 Where possible, shrub beds should be designed with tapered or flowing edges (no 90 degree corners) to allow for ease of mowing, and eliminate the need for hand trimming.
- 7.4.8 On drawings, shrub symbols should be shown at mature size with no overlap. However ground covers symbols may be overlapped at the discretion of the City. The intent is to achieve a balance between aesthetic impact, shrub health and maintenance concerns.

7.5 Tree and Shrub Minimum Sizes

- 7.5.1 Unless noted otherwise or approved by Parks, all planting shall be a minimum of 50 mm caliper for deciduous trees and 2.0 m height for Coniferous trees. A tree mix of deciduous and coniferous is generally encouraged where practical.
- 7.5.2 If proposed trees are less than the minimum caliper, additional plant material may be required, at the discretion of the City.
- 7.5.3 80mm caliper and larger trees will be accepted in boulevards if tree root trenching is proposed, and if there are no conflicts with utilities. A one year warranty period from CCC to FAC will apply in this case. Milestone inspections for tree root trenching will be required during trenching excavation. The consultant is to request an inspection with the City Inspector 5 (five) business days prior to tree root trenching. If tree root trenching in boulevards is not proposed for trees 80 mm caliper and larger, then a 2 (two) year warranty period from CCC to FAC will apply. The City reserves the right to evaluate this standard on a case-by-case basis.
- 7.5.4 Coniferous trees up to the height of 3.0 m will be permitted with an appropriate root ball specified in the current edition of The City of Edmonton Design and Construction Standards. All proposed trees planted with a tree spade will need to follow the current Specification 02930 Trees, Shrubs and Ground Covers, ball sizes for coniferous trees item 3.4.5, and will be treated as a transplant as per detail LA104.
- 7.5.5 Minimum shrub spacing shall be based on spread at maturity with no overlap. With the exception of naturalization areas, shrub size at planting shall be a minimum of 300mm height for deciduous shrubs and a spread of 450mm for coniferous shrubs. Reference Specification 02930 Trees, Shrubs and Ground Covers.

7.6 Required Planting Quantities for Open Spaces and Public Utility Lots

- 7.6.1 The following tree quantities are the minimum requirements for base level development. The total area of parkland, minus retained tree stand areas, shall be

used to calculate planting requirements. Credit for individual retained specimen trees may be considered by Parks.

- River Valley, Top of Bank, and Ravine Parks (where planting is required): 70 trees/ha.
- District Activity Parks: 45 trees/ha.
- Pocket Parks: 70 trees/ha.
- Urban Village Parks: 65 trees/ha.
- School and Park Sites: 55 trees/ha.
- Greenways: 200 trees/ha (Note: this has been reduced from 240 trees/ha as specified in UPMP) assuming 10m width and 2 trees/10 lineal meters; (Breathe specifies 8-10m spacing).
- 70 trees/ha is required for Utility ROWs, Stormwater Management Facilities, other public utility lots, and other parkland not identified above.

- 7.6.2 If these required trees in open spaces and public utility lots cannot be planted due to utility or access or other conflicts, these required trees must be planted within the same stage of development. However, if planting within the same stage is also not possible due to utility or access or other conflicts, these trees must be provided in another stage at the discretion of the City. These trees must be above base level requirements for that stage and in addition to the original landscape design for that stage. In addition, this stage cannot be a future stage, unless approval is given by the City.
- 7.6.3 If trees cannot be installed elsewhere in the same stage or in another stage approved by the City due to conflicts in all of those stages, no additional compensation will be required. Otherwise, trees must be provided in those stages.
- 7.6.4 Seven 5 gallon or larger shrubs can be substituted for one tree, to a maximum of 10% of the total number of required trees for each site, at the discretion of Parks.
- 7.6.5 Parks retains the right to request variances from the required quantities as listed above.

7.7 Approved Tree Species, Spread and Spacing Requirements

- 7.7.1 Forestry and Parks have developed a list of acceptable tree species with recommended spacing and spread, reference Appendix E Tree Diversity Guidelines and Approved Species Spread and Spacing. Spacing may be changed at the discretion of Forestry, or by acceptance of drawings via the tender process. Agreed upon minor adjustments may be made on site. In all situations, minimum utility off-set distances must be adhered to, unless otherwise approved.
- 7.7.2 Trees identified in Appendix E Tree Diversity Guidelines and Approved Species Spread and Spacing, must be suitable for the location and microclimate, and will be reviewed for by Forestry during the drawing review process. It is recommended that discussions are held with Forestry in advance of drawing

submission for plantings that might be different from normal applications and/or to determine if current urban conditions may preclude certain tree species on the list. The Landscape Architect may propose alternative tree species not listed.

7.7.3 When grouping Coniferous trees, place trees in mulched beds with appropriate spacing as per the recommended tree spacing.

7.7.4 Tree spacing and species selections should consider site specific CPTED principles and sightline concerns.

7.8 Planting Perennials

7.8.1 Perennials in planting beds will be reviewed on an individual basis and accepted at the discretion of Parks.

7.8.2 Only low maintenance, non-invasive and hardy perennials will be accepted, at the discretion of Parks.

7.9 Planting Annuals

7.9.1 Annual plantings shall not be approved in planting beds to be maintained by the City.

7.9.2 Annuals may be approved in planting beds by Parks on a temporary basis, when maintained by the Developer or other groups. Annuals must be removed prior to FAC approval, with the area rehabilitated as indicated and approved on the landscape drawings.

7.10 Tree Protection Zone

7.10.1 Protection of City trees adjacent to or within the construction zone, including but not limited to tree hoarding, is required until completion of all construction activities. Reference Detail LA101 Tree Protection Zone. The Landscape CCC may be granted without sod being installed, on local road boulevards.

7.10.2 All tree protection zones are to be removed by the Developer, after issuance of the FAC by the City, unless otherwise directed.

7.11 Weed Control

7.11.1 Noxious weeds must be controlled in accordance with the Alberta Weed Control Act. Prohibited noxious weeds must be eradicated in accordance with the Provincial Weed Control Act (see Reference section).

7.11.2 Aquatic invasive species shall be controlled as per the Fisheries (Alberta) Act.

7.11.3 Landscaped areas must be kept free from weeds between construction commencement and issuance of FAC. Failure to do so will result in control action by the City, and all costs shall be borne by the Developer/Contractor.

7.11.4 Natural areas and naturalized areas must be in compliance with the Alberta Weed Control Act and associated Natural Area Management Plan (NAMP), prior to issuance of FAC.

7.12 Roses

- 7.12.1 Roses with horizontal root habits (e.g. Prickly Rose – Rosa Acicularis) shall not be allowed in ornamental landscapes and are appropriate in naturalized landscapes only.
- 7.12.2 Shrubs with horizontal root habits (e.g. Prickly Rose – Rosa Acicularis) shall not be allowed along private property lines.

8. Site Specific Features

8.1 Boulders

- 8.1.1 The use of boulders is encouraged to provide interest to the landscape. Boulders are to be located in shrub beds or other non-mowed areas to minimize maintenance activities such as grass trimming.
- 8.1.2 Any rock with a minimum 300 mm diameter can be considered a boulder, regardless of shape.
- 8.1.3 Boulders are to be immovable by hand and located in visible areas to minimize public safety hazards.
- 8.1.4 Boulders are prohibited in road islands and medians.
- 8.1.5 Refer to Construction Specification 04420 Feature Boulders and Collected Stone.

8.2 Site Furniture and Setbacks

- 8.2.1 Furniture such as benches, picnic tables and litter receptacles may be provided on parkland if appropriately located and approved by Parks.
- 8.2.2 Contact information (company name and phone number) on litter receptacles shall be placed and made visible by the Developer on developer/contractor maintained sites and removed at FAC.
- 8.2.3 Vandal-proof hardware (tamper resistant and locking) is required on all site furniture, with a minimum of one per receptacle, two per bench and two per picnic table. Refer to Construction Specification 02870 Site Furnishings for technical requirements.
- 8.2.4 Minimum required setback distances for site furniture is given in Volume 1: General Standards in the Table of Offsets. All site furniture must be placed on a concrete pad.
 - The concrete pad should extend 150 mm beyond the outside edges of the site furniture to accommodate mowing.
 - The concrete pad and adjacent surfaces (turf, concrete, asphalt, etc) must be level with the concrete so there is no trip hazard.

8.3 Fencing General Requirements

- 8.3.1 All fencing heights on residential properties shall conform to the Edmonton Zoning Bylaw 12800, Section 49, Fences, Walls and Gates in Residential Zones.
- 8.3.2 All Wood Screen Fencing shall conform to City of Edmonton Details LA400-LA406.

- 8.3.3 All Wood Screen Fence step down shall conform to the Edmonton Zoning Bylaw 12800, Section 49. Also reference City of Edmonton Detail LA406.
- 8.3.4 All Wood Screen Fencing shall have a gap not exceeding 50 mm between finished grade and the bottom of the lower stringer. Reference City of Edmonton Detail LA405.
- 8.3.5 All Sound Attenuation Fencing shall conform to the City of Edmonton Design and Construction Standards, Volume 2: Complete Streets, Detail 5205.
- 8.3.6 All Chain Link Fencing shall conform to City of Edmonton Details LA407-LA409A.
- 8.3.7 Fencing with pickets extending beyond the top rail provided by Developers are prohibited on or adjacent to residential properties.
- 8.3.8 Other styles of fencing may be proposed subject to approval by Parks.
- 8.3.9 Any disturbance to landscaping as a result of fencing construction shall be remediated to the satisfaction of the City , and no CCC for fencing shall be given until this remediation is complete to the satisfaction of the City.
- 8.3.10 Fencing must not impede access for EPCOR Distribution and Transmission to switching cubicles.

8.4 Fencing Adjacent to Open Space

- 8.4.1 School park sites and other park sites are to be separated from private development by permanent fencing. Fences including the concrete pile must be constructed wholly within private property. Fencing is to be a minimum 1.2 m height and suitable for restraining pets.
- 8.4.2 Fencing adjacent to parkland with formalized sports fields or future sports fields shall be a minimum 1.8 m height and protect against stray balls. Since sports fields on a site may be realigned in the future, any private properties adjacent to a site with potential future sports fields shall be separated using 1.8 m height fencing. Contact a Planner/Parks or Landscape Technician/Parks pertaining to the site program.
- 8.4.3 Should the developer choose to provide above base level park site development (i.e. Urban Village Parks, School Park Sites and District Parks), improvements will fall under the Developer Funded Parks Initiative requirements and Temporary Wood Rail Fencing requirements may be reduced and/or eliminated at the discretion of Parks. Upon completion of school and park sites, grade, topsoil and seed, the Developer is to install a Temporary Wood Rail Fence. Reference City of Edmonton Detail LA401. All undeveloped park sites are to be left undisturbed. The City of Edmonton will take ownership of the Temporary Wood Rail Fence when a FAC is issued for the landscaping on the subject site. The Developer is required to restore the site back to its original condition, should any disturbance occur.

8.5 Site Drainage and Runoff Reduction

- 8.5.1 Due to the prevailing trend toward warmer, drier conditions and large storm events, Parks encourages implementation of designs which facilitate increased infiltration and percolation to enhance on-site turf, tree and shrub growth, prior to entering mechanical drainage systems. We encourage the use of Low Impact Design principles, however, mechanical drainage may still be required.

9. Specific Developments

9.1 School and Park Sites

- 9.1.1 Refer to the Urban Parks Management Plan (UPMP) for definitions of park types and base level development requirements. The following selected standards address specific design issues that commonly arise on sites containing schools, playgrounds and/or community league installations.
- 9.1.2 Program requirements for new school and park sites vary from site to site, depending on school type, park size and the requirement for a Community League envelope. Designers are advised to contact Planner/Parks or a landscape architect with Parks to determine the program for a specific site before proceeding with design. This includes space requirements for School Sites, Community League Sites, Sports Fields and passive areas.
- 9.1.3 All school and/or park sites are to be fully serviced along the entire roadway frontage including three phase power as per Subdivision Authority approval. Pocket parks of 0.5 ha or smaller may require three phase power and will be dealt with on an individual basis.
- 9.1.4 School and/or park sites may have other specific design considerations and requirements including, but not limited to, the following:
- A school bus drop-off zone with adequate roadway frontage to accommodate bus parking.
 - Avoid access points to the schools, playgrounds, and Community Leagues through/across vehicular movement areas.
 - Locating playgrounds centrally between Community League sites and schools is desirable. Wherever possible, playgrounds should also have visual connection to any publically accessible heated areas/structures but not be in their shadow in winter.
 - Major activity nodes such as rinks, tennis courts, basketball courts, parking lots and playgrounds should be located as far from adjacent private property as possible.
 - Community League sites are typically provided with parking space for approximately 30 vehicles.
 - Connecting walkways through school and park sites are recommended to encourage neighbourhood walkability.
 - Drainage from general park areas is to be directed around school sites, as these sites are considered to be separate properties.

- Drainage from general park areas is to be directed away from critical areas such as buildings on community league sites.
- Drainage is to be directed away from playgrounds to reduce the potential for flooding.
- Other design guidelines are available in the Edmonton Joint Use School Site Functionality Study, available at:

[Edmonton Joint Use Agreement](#)

9.2 Sports Fields

- 9.2.1 Sports fields require a minimum 6.0 m safety setback beyond the field of play. The setback area must be turf with no vertical objects, and without hard or granular surfacing. For ball diamonds, this also extends to a line 6.0m beyond and parallel to an extension of the backstop, down the first and third base lines, and behind the backstops. Larger setbacks to property lines are generally desired, dependent on field orientation and level of play. Contact a landscape architect with Integrated Infrastructure Services at the City for more information.
- 9.2.2 Contact a landscape architect with Integrated Infrastructure Services at the City for sizes, slopes and other sports field design requirements.
- 9.2.3 Sports fields may be crowned or slanted in one direction with a recommended slope of 1%. Sheet drainage is generally preferable to swales to avoid concentration of drainage and the potential for wet areas, as well as encumbrance of the site. Slopes greater than 1% from end to end are not recommended on soccer fields but may be considered cross-wise.
- 9.2.4 All sportsfields must be inspected during sub base installation and prior to topsoil installation by Director Parks Operations or Designate.
- 9.2.5 Topsoil sample results must be submitted and approved by Director, Parks Operations or Designate for approval and adherence to soil standards prior to installation.
- 9.2.6 All sports fields must be inspected during topsoil installation and prior to seed or sod installation by Parks.
- 9.2.7 Proposed turf grass mixes must be submitted to the Director, Parks Operations or Designate for approval prior to seeding sports fields. Seed lot tags must be submitted to Parks Operations post seeding in order to verify seed source and type.
- 9.2.8 Project Manager and or Consultant must supply maintenance and establishment records to the Director, Parks Operations or Designate on internally built sports fields or to Director, Parks Planning or designate on developer built sports fields. These records must outline: Mowing, Irrigation, Weed Management, Fertilization; (type and rate), Aeration, Overseed and Topdressing including the date each task occurred, provided over grow-in period (CCC to FAC).

9.3 Playgrounds

- 9.3.1 All new or upgraded playgrounds must meet the current CSA Z614 Children’s Playspaces and Equipment, and The City of Edmonton Playground Equipment Standard. The Landscape Architect must consult with Parks Operations, Playspaces prior to proceeding with design work.
- 9.3.2 All new or upgraded playgrounds must meet the requirements set out in the Playspace and Wheeled Sport Facility Design and Construction Standards. This standard is available at:
[Playspaces and Wheeled Sports Facilities Design and Construction Standards](#)
- 9.3.3 Designs for play spaces that are innovative and provide a diversity of play and learning experiences are encouraged.
- All manufacturer documentation and reference materials must be submitted for drawing review. This includes equipment for play grounds, splash pads, skate parks and fitness pods. Refer to the Playspace and Wheeled Sport Facility Design and Construction Standards.
- 9.3.4 A drainage sump is not permitted unless there is no acceptable drainage alternative, which shall be subject to approval. The Project Manager and /or Consultant must submit drainage alternatives to Parks on developer built Playspaces for approval. Drainage shall be connected to the EPCOR infrastructure, such as a catch basin.

9.4 Greenways

- 9.4.1 Areas accepted as Greenways are to have a minimum 10m width unencumbered with utilities or easements to accommodate pathways, site furniture and associated planting. Variances to this requirement will be considered on a site-specific basis.

9.5 Natural Areas

- 9.5.1 Areas designated as Natural Areas must adhere to the site-specific Natural Area Management Plan (NAMP) or, if one is not available, use the City-Wide Natural Area Management Plan, available at this link:

[City Wide NAMP](#)

9.6 Dog Off-Leash Areas

- 9.6.1 Refer to Dogs in Open Spaces Strategy for definitions of off-leash area types and base level amenity requirements. The following selected standards address specific design issues that commonly arise within dog off-leash areas.
- 9.6.2 Off-leash areas have a recommended size of 0.2 ha to 4 ha; sites smaller than 0.2 ha (dog runs) must be fully fenced.
- 9.6.3 Full amenity requirements for new off-leash areas vary depending on off-leash areas type. Designers are advised to contact the Dog Off-Leash Coordinator at the City to determine the requirements for a specific site before proceeding with design.

- 9.6.4 Standard amenities required for all off-leash sites include waste bins (large volume in-ground bins are preferred), waste bag dispensers, signage which must include bylaws and code of conduct, a map of off-leash site boundaries, and contact information for emergencies, bylaw enforcement, open space, and trees.
- 9.6.5 If an off-leash area has a designated parking lot, signage must be present at the entrance to the designated parking to indicate that dogs must be leashed in the parking area. Signage templates are available from the Dog Off-Leash Coordinator with the City.
- 9.6.6 Waste bins must be located at all entries into off-leash area as well as key locations throughout the site to encourage owners to properly dispose of waste. Waste bins should be easily accessible by waste collection vehicles.
- 9.6.7 Waste bag dispensers must be provided in key locations throughout the site and in close proximity to waste bins.
- 9.6.8 Special amenities may be included such as seating, access to drinking water (humans or dogs), dog wash station, washrooms, notice boards, separated areas for large and small dogs, mix of conditions (forest, field, etc), shelter structures, or lighting, at the discretion of the City.
- 9.6.9 Shrub or perennial beds must not be located within off-leash areas. Trees planted within the off-leash areas must be hoarded until fully established.
- 9.6.10 All off-leash areas must have a minimum slope of 1% with positive drainage. Sightlines must be preserved to ensure safety and visibility and must not include hills or valleys where dogs can move out of sight. Within District, River Valley/ Ravine and Neighbourhood level off-leash areas (unfenced) grass is recommended for large, open, well-draining areas with low intensity of use. Areas of high intensity use such as bottlenecks and entryways must be surfaced with base 100 mm of road crush 50 mm 10 mm- crush. See 'Complete Streets Design Standards Section 3.5 for path/ trail standards. Neighbourhood fenced off-leash areas must have a minimum slope of 1% and be surfaced with surface profile of base of 100 mm of road crush 50 mm 10 mm- crush.
- 9.6.11 Fencing must be a minimum of 1.2 m high black chain fabric including entryway areas See 'Fencing General Requirements' for fencing specifications. Gates must also fall within the requirements for fencing and contain a latch system easily accessible from both side of gate. All fenced off-leash areas must incorporate dual gate systems at all entrances.
- 9.6.12 Fencing entrances must include a 2.4 m x 2.4 m vestibule area with 1.2 m double access gates. The vestibule area as well as a minimum of 2.4 m x 3.6 m extending into the off-leash area must have concrete or asphalt.
- 9.6.13 Fence design should avoid or limit use of 90 degree (or less) angles wherever possible.
- 9.6.14 Gaps between gates and fence or gate and ground should not exceed 10 cm.
- 9.6.15 Access for service vehicles into the fenced off-leash area through a 3 m gate must also be provided.

9.6.16 Off-leash areas require minimum setbacks from adjacent land uses; these are available in the Table of Offsets in Volume 1 of the City of Edmonton Design and Construction Standards.

10. Road Rights-of-Ways

10.1 General Landscape Requirements

- 10.1.1 All landscaping in road R.O.W's shall conform to setbacks as described in the Table of Offsets in Volume 1 of the City of Edmonton Design and Construction Standard.
- 10.1.2 All trees shall be planted as per Volume 2 Complete Streets of the City of Edmonton Design and Construction Standards.
- 10.1.3 Alternative tree and shrub species for roadway planting will be considered and are subject to approval by arks.

10.2 Local and Collector Boulevards

- 10.2.1 No planting beds, shrubs or groundcovers shall be installed on local or collector roads, with the exception of traffic calming islands.
- 10.2.2 Shrubs and trees may be planted on traffic calming islands with approval by Transportation Services and Parks. Where possible, use a minimum of one tree per island to indicate plant material in bed. Shrubs must be low growing, with a maximum 750 mm height at maturity.
- 10.2.3 Shrubs and trees may be planted along the fence at neighbourhood entrances with approval by Transportation Services and Parks. The mature shrubs spread must be 500 mm back from the fence and not be a suckering species.
- 10.2.4 Boulevards separated by walks must be graded and topsoiled with a minimum depth as described in Specification 02910 , and sodded between the back of curb and the walk by the Developer to the satisfaction of Parks.
- 10.2.5 There are no tree planting requirements on local boulevards, although the addition of trees is encouraged.

10.3 Collector Roadways

- 10.3.1 Collector roadways must incorporate a utility-free planting corridor within boulevards and medians to accommodate planting requirements with appropriate setbacks.
- 10.3.2 Collector Roadways must be graded and topsoiled with a minimum depth as described in Specification 02910 and sodded within ROW.
- 10.3.3 Tree planting is required on collector roads, and shall be calculated at a minimum requirement of one tree per 10 linear meters of roadway (both sides). Roadway length is to be measured down the center of the road excluding municipal intersections (private accesses, driveways, alleys, etc. are to be included in the linear meter measurement). Trees should be planted in a continuous root trench.

- 10.3.4 Trees shall be spaced as appropriate to the species and as recommended by Forestry, and must respect minimum offset distances to existing utilities within the R.O.W. Reference E Tree Diversity Guidelines and Approved Species Spread.

10.4 Arterial Roadways

- 10.4.1 Arterial roadways must incorporate a utility-free planting corridor within boulevards and medians to accommodate planting requirements with appropriate setbacks.
- 10.4.2 The design intention of arterial planting is to provide shade and block low sun, with the exception of commercial and school areas. The standard does not dictate that there must be rows of trees and shrubs, only an equivalent amount of plant material. Designs unique to each arterial roadway are encouraged. The City of Edmonton is moving towards a more naturalized aesthetic along many roadways. Naturalization designs for arterial roadways is encouraged and should be used in appropriate locations, using the appropriate grass, shrub and tree species. Reference Section 7.3 Naturalization.
- 10.4.3 Arterial R.O.W must be graded, topsoiled, seeded or sodded, and landscaped to the satisfaction of Parks.
- 10.4.4 There shall be a row of boulevard trees calculated at a minimum requirement of one tree per 10 linear meters of roadway on both sides of the arterial roadway. Roadway length is to be measured down the center of the road excluding municipal intersections (private accesses, driveways, alleys, etc. are to be included in the linear meter measurement). Trees should be planted in a continuous root trench.
- 10.4.5 Trees shall be spaced as appropriate to the species and as recommended by Forestry. Reference Appendix F Tree Diversity Guidelines and Approved Species Spread and Spacing.
- 10.4.6 Shrubs are required on arterial roadways calculated at a rate of 1 shrub for every 1.2m when the minimum distance between the shared-use path (SUP) and property line is 2.0m. Shrubs are to be in a shrub bed behind the SUP; tree plantings may be substituted at an equivalent rate.
- 10.4.7 Where possible, new utility locations shall be adjusted accordingly to accommodate landscaping, as long as new utility location clearances conform to the requirements outlined in the City of Edmonton Design and Construction Standards. For existing utilities, the minimum offset distances specified in the City of Edmonton Design and Construction Standards shall be maintained.
- 10.4.8 On 4.5 m or greater width arterial medians, there shall be a row of trees at a minimum requirement of one tree per 10 linear meters of arterial median. Trees should be planted in a continuous root trench.
- 10.4.9 Trees shall be spaced as appropriate to the species as recommended by Forestry, reference EAppendix F Tree Diversity Guidelines and Approved Species Spread and Spacing. Planting in narrower medians will be considered on an individual

basis by Transportation Services and Parks. Trees must be contained within a continuous mulched bed.

- 10.4.10 Within commercial and school zones, the requirement for shrubs along an arterial roadway is waived, but where opportunities exist, shrub planting in these areas is encouraged.
- 10.4.11 Planting requirements for tree and shrubs on arterial sections adjacent to natural areas will be reviewed on an individual basis, and a reduction of the planting quantities may be considered.
- 10.4.12 Intersections and areas presenting safety sight line conflicts are exempted from the above requirements. Intersections will be evaluated by Transportation Services to ensure that safety sight lines requirements are met.
- 10.4.13 On existing arterial roadways, the arterial roadway standards shall only be applied when the arterial boulevard includes a sidewalk and is graded to its final grade. Trees are to be planted at their ultimate location and grade. Allowance shall be made for conflicts with existing utilities.
- 10.4.14 When roadway construction is implemented in stages, the landscape requirement applies only for the side of the roadway that is being developed to its permanent configuration.

10.5 Industrial Areas

- 10.5.1 Collector roads and Arterial roads in industrial areas require landscaping as per the requirements in Sections 10.3 and 10.4, respectively. The shrub requirement will be evaluated on a case-by-case basis by Parks dependent on the existence of frontage landscaping by adjacent owners. It is anticipated that most industrial area arterials will require shrub planting. Naturalization is encouraged in industrial areas. Reference Section 7.3 Naturalization.
- 10.5.2 Local industrial roads require five trees per side, extending back from an intersection with a collector or an arterial. Adjust utilities as required.

10.6 Conflicts

- 10.6.1 Any required trees, as per the conditions in Sections 10.3, 10.4, and 10.5, that cannot be planted due to utility or access or other conflicts, must be planted within the same stage of development. However, if planting within the same stage is also not possible due to utility or access or other conflicts, these trees must be provided in another stage at the discretion of the City. These trees must be above base level requirements for that stage and in addition to the original landscape design for that stage. In addition, this stage cannot be a future stage, unless approval is given by the City.
- 10.6.2 If trees cannot be installed elsewhere in the same stage or in another stage approved by the City due to conflicts in all of those stages, no additional compensation will be required. Otherwise, trees must be provided in those stages.

10.7 Major Entrance Routes to the City and Downtown

10.7.1 Where appropriate, boulevards and medians shall be designed to include continuous planting beds with trees, shrubs and groundcovers.

10.8 Major Commercial Corridors

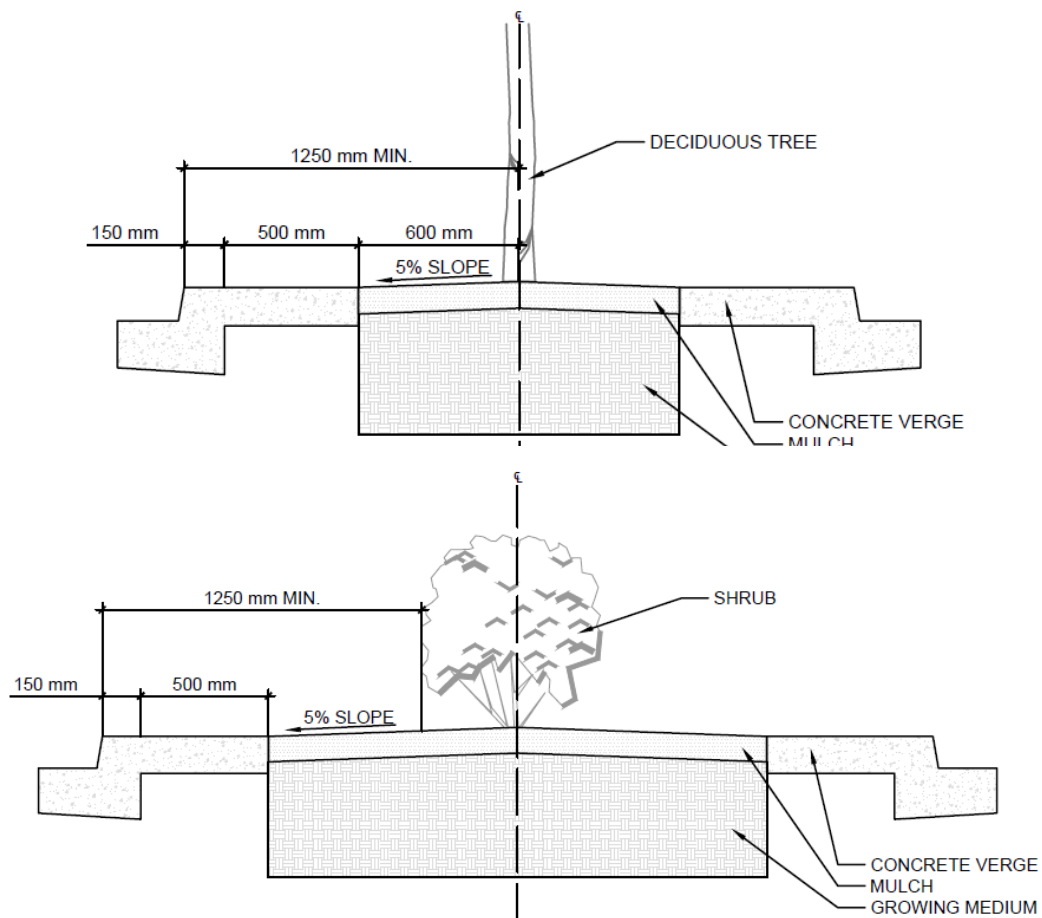
10.8.1 Where appropriate, boulevards and medians shall be designed to include continuous planting beds with trees, shrubs and groundcovers.

10.9 Road Islands, Median, and Entry Features

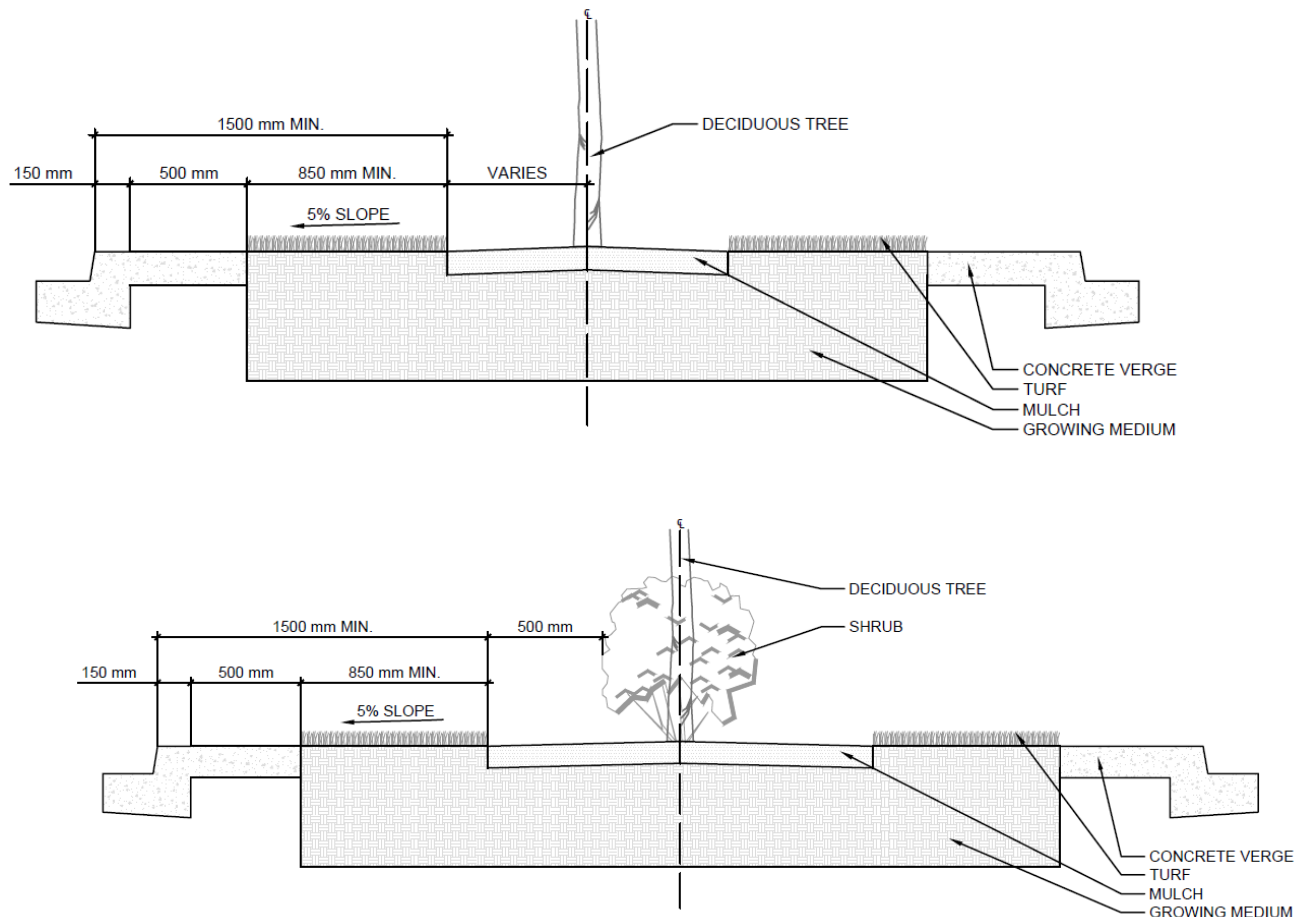
10.9.1 All road islands, medians and entry feature designs are encouraged to be low maintenance. Where appropriate, designs shall include trees, shrubs, groundcovers, mulch, and sod to the satisfaction of Parks.

- Road islands and medians required a 500 mm concrete verge on either side of the road island/medians.
- Shrubs and Perennials must be low growing with a maximum mature height of 750 mm.
- Trees planted in center medians are to be in continuous mulched beds.

10.9.2 A minimum 1.25 m setback measure from the face of curb, is required on both sides of the median and mature plant material shall not extend into the setback (to accommodate snow storage and spring sediment removal).



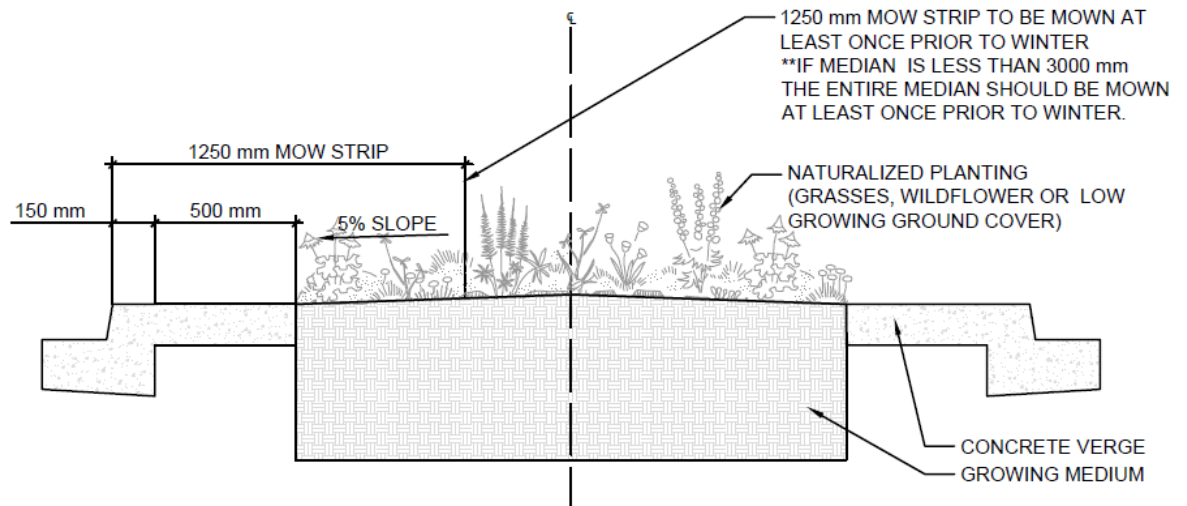
- 10.9.3 Should turf be specified a minimum 1.5 m setback measure from the face of curb is required; the concrete verge may be included in this measurement. Mulch beds or mulch tree wells shall not extend into this setback.



- 10.9.4 Medians are appropriate areas for naturalization. Medians that incorporate naturalized trees and shrubs must follow required setbacks from walkways and roads as per Volume 1: General Design and Construction Standards Table of Offsets. Narrow medians can be naturalized with grasses, wildflowers and low growing ground cover as long as plant material does not fall onto the roadway. A minimum median width is not required in order for a median to be considered for naturalization. Determining which medians are appropriate for naturalization should be based on safety requirements (e.g. sight lines, mowing access), environmental conditions (suitability for plant material), and the aesthetic of the surrounding landscape (i.e. proximity to existing naturalized or natural areas).

- 10.9.5 Naturalized roadways and medians do not require a mowed buffer strip to be consistently maintained. A minimum of 1.25 m buffer strip measure from the face of curb should be mowed at least once prior to winter in order to accommodate

snow storage and spring sediment removal. Depending on the type of equipment used, mowing a buffer strip may be required up to three times during a growing season in order to accommodate for spring sediment removal. For medians less than 3.0 m wide the entire median should be mowed in the fall in preparation for sediment removal the following spring.



- 10.9.6 The required cross slope shall not be less than 5% from center of island to curb.
- 10.9.7 Turf specified in road islands or medians shall be designed to allow a 1300 mm driven mower to access from the end of the median and drive parallel to traffic with both wheels on the median. At no time should the mower be required to run perpendicular to traffic.
- 10.9.8 If aggressive groundcovers (i.e. gout weed), are proposed for use in road islands or medians, no other groundcovers or shrubs shall be planted in the same planting bed.
- 10.9.9 Free standing architectural features shall not be located within turf areas unless appropriate consideration is given to maintenance and mowing requirements. Examples of free standing architectural features include: signs, sculptures, light poles or entry gates.
- 10.9.10 All paving stone and paving stone headers, concrete or other special hard surfaced verges or walks shall be to the satisfaction of Transportation Services.
- 10.9.11 Planting details of road islands and medians are to be drawn at an appropriate scale and shall illustrate a suitable rooting zone for proposed planting, indicating the soil depth, width, mulch and type.
- 10.9.12 Cross sections of road islands and medians shall be drawn to an appropriate scale showing:
 - Above and below ground utility alignments within 3.0 m of road island;
 - Curb face;

- Back of curb, verge or walk;
- Tree and shrub setbacks;
- Proposed planting and spacing; and
- Landscape mulches and free-standing features, (i.e. signs, gates, pedestals, sculptures and light poles).

10.9.13 Planting cross sections and planting installation details shall be cross-referenced with engineering and landscape plans which support the proposed design solution.

10.9.14 Above and below grade utilities should not be located under landscaped road islands or medians to avoid conflicts with landscape improvements.

11. Walkway, Emergency Rights-of- Ways and Top of Bank Landscape Requirements

11.1 Walkway and Emergency rights-of-Ways

11.1.1 R.O.W. areas must be graded, topsoiled, and seeded or sodded, including planted with trees, shrubs and groundcovers to the satisfaction of Parks.

11.1.2 Groundcovers such as herbaceous perennials are not desired, although exceptions for very hardy species may be made by Parks. Invasive groundcovers such as goutweed will not be accepted.

11.1.3 There shall be a minimum of four trees per 35 linear meters of walkway R.O.W. Shrubs may be substituted at a rate of seven shrubs per tree to a maximum 10% of the total number of pathway trees required, unless otherwise approved.

11.1.4 All trees in R.O.W's and PUL's with a 1.5 m walkway shall be set back a minimum distance of 1.0 m from center of tree trunk to the adjacent private property lines, in order to allow for root trimming at the discretion of Parks. Trees must be contained within mulched beds. All minimum utility setbacks are to be maintained. Reference Volume 1 of the Design and Construction Standards Table of Offsets for tree setbacks from utilities and property lines.

11.1.5 Furniture may be provided by the Developer and placed at strategic locations within a walkway R.O.W. (i.e. entry points).

11.1.6 Bollard barrier post standards and spacing must be approved by Transportation Services, and, where shrub beds are proposed, included within the mulched bed for ease of maintenance.

11.1.7 Where possible, below grade utilities should be located under hard surfaced walkways to avoid conflicts with landscape improvements.

11.1.8 Where a walkway is designated as an emergency access route, shrubs must be included within the R.O.W. with a minimum 0.5 m setback from the edge of the mature shrub to the edge of the walkway. Plant material locations must maintain an unobstructed clearance of 4.0 m to provide emergency vehicular access.

11.1.9 For walkway R.O.W's, there shall be no shrubs exceeding a mature spread of 2.0 m.

- 11.1.10 The following design issues shall be considered when reviewing proposed plant materials:
- Maintain adequate year-round sight lines through the walkway R.O.W. for pedestrian safety and security.
 - Maintain a minimum 2.5 m branching height for all deciduous trees in R.O.W's at maturity to allow adequate pedestrian clearance beneath tree branches.
 - Utilize low maintenance hardy plant species suitable for Edmonton's climatic zone of 3a.
 - Encourage use of pyramidal/columnar tree forms to avoid tree branches overhanging into adjoining privately owned lands.

11.2 Top of Bank Landscape Requirements

- 11.2.1 All Top of Bank development must conform to The City of Edmonton Top of Bank Policy. Reference Appendix B Top of Bank Policy C542A.
- 11.2.2 Top of Bank landscapes shall be inspected to ensure that they match existing grades. The inspection will review the following requirements:
- There is no dumping on the site;
 - The site must be controlled as per the Alberta Weed Control Act;
 - The trail should be offset a minimum of 1.5 m from private property, unless the geotechnical report would necessitate encroachment of the minimum offset, and provide a mow strip of 1.0 m on either side of the trail; and,
 - The site is left in a state that meets the City's satisfaction.

12. Major Utility Corridors

12.1 General Landscape Requirements

- 12.1.1 Tree plantings should be designed and massed into major groupings in beds. . In the event that the Utility Authority will not allow landscaping in the R.O.W. the requirement for all or a portion of the landscaping will be waived.
- 12.1.2 Naturalization is a requirement for all non-programmable space in utility corridors, unless prohibited by the applicable utility company. See Section 7.3 for further details on naturalization.
- 12.1.3 The Landscape Architect is responsible for contacting the appropriate Utility Authority to determine acceptable landscaping parameters, such as tree species, sizes, locations, etc. on the utility R.O.W. If it is determined that the landscaping requirements are unacceptable to the Utility Authority, written confirmation of this must be provided for the exception.
- 12.1.4 The Landscape Architect is responsible for circulating and obtaining approval for the Landscape Drawings from the Utility Authority, and coordinating a formal Crossing Agreement between the Developer and the Utility Authority.
- 12.1.5 The Landscape Architect shall provide to Parks written confirmation from the Utility Authority when landscaping in utility corridors is not permitted.

- 12.1.6 Shrubs shall be massed within planting beds.
- 12.1.7 Healthy existing trees within or abutting the utility corridor shall be preserved wherever possible in accordance with the City of Edmonton Corporate Tree Management Policy C456B, administered by Forestry. Retained tree or shrub areas within the corridor are exempt from planting requirements.
- 12.1.8 Landscape amenities (i.e. street furniture) may be provided by the Developer and placed at strategic locations within the utility corridor to the satisfaction of Parks and the Utility Authority.
- 12.1.9 Walks, when provided within the R.O.W. shall be to the satisfaction of Sustainable Development, Transportation Services and the Utility Authority.

12.2 Landscape Requirements for Alta Link Corridors

- 12.2.1 The Landscape Architect shall ensure all transmission or distribution towers, pole lines, pylons, and overhead and underground cables are accurately plotted on the landscape plans. All minimum setbacks from these facilities shall be referenced on the landscape plans to ensure no landscape improvements encroach into specified safety zones.
- 12.2.2 The Landscape Architect shall circulate landscape plans to Development Coordination through the standard plan circulation process.
- 12.2.3 Parks will review and approve landscape plans through the circulation process.
- 12.2.4 The Landscape Architect shall field stake all landscape improvements identified on the approved landscape drawings with the contractor prior to installation, having regard for the required safety setbacks from existing utility facilities within the R.O.W.
- 12.2.5 The Developer shall not commence construction until the appropriate Authorities (e.g. Alberta One Call, Shaw, etc.) have flagged below grade utilities.
- 12.2.6 The Developer shall not commence any ground disturbance until all of the above conditions have been satisfied.

12.3 Requirements for Developing and Landscaping in High-Pressure Oil/Gas Transmission Pipeline Rights-of-Ways

- 12.3.1 These requirements provide for some limited & strictly controlled development without compromising the safety and/or integrity of high-pressure oil/gas facilities.
- 12.3.2 These requirements apply to all high pressure oil and gas transmission pipeline rights-of-ways.
- 12.3.3 Authorization must be requested and approved by all Utilities for all development on pipeline R.O.W.
- 12.3.4 As part of the engineering drawing process, the Landscape Architect must consult with all affected pipeline operators and obtain authorization on matters including, but not limited to, walkway alignment in relation to pipelines, permitted

contouring, future access requirements for maintenance/repairs, and permitted landscaping/ vegetation planting.

- 12.3.5 The responsibility for maintaining any of the above developments on the R.O.W. shall rest with the municipality once FAC is granted, unless otherwise negotiated, or with the pipeline operator if the pipeline operator prefers to conduct their own vegetation management.
- 12.3.6 If naturalized, naturalization signage of these developed R.O.W. may be provided by the City and retrieved, installed, and maintained by the Developer for Utility ROWs per Section 7.3.4.
- 12.3.7 Any other proposed developments and/or use for the R.O.W. are not permitted.
- 12.3.8 Pre-existing deviations from the standards which are otherwise non-compliant shall be allowed to continue until redevelopment occurs.

13. Constructed Wetlands, Stormwater Management Facilities

13.1 General Landscape Requirements

- 13.1.1 Naturalization and associated naturalization signage is required within stormwater management facilities as per Section 7.3.4. Signage would identify the design intent for the area to be naturalized, and provide education for public awareness on the establishment and management of the pond. Signage would also provide education on the environmental, social, and economic benefits for naturalized landscapes or natural wetlands.
- 13.1.2 Naturalization of stormwater management facilities must follow Section 7.3.
- 13.1.3 Constructed wetlands, wet ponds and areas surrounding new stormwater management facilities must be graded, topsoiled, seeded or sodded, and landscaped by the Developer to the satisfaction of Parks.
- 13.1.4 Plant materials shall be selected to respect soil characteristics, side slopes, sun orientation, type of facility and its intended use.
- 13.1.5 The area for quantity calculations shall be calculated from the Normal Water Level. A limited number of trees of flood tolerant species may be planted below the 1:5 year flood level, subject to approval of Parks. These trees will be credited towards the required number.
- 13.1.6 Shrubs shall be massed in groups above the 1:5 year flood level to create a natural aesthetic. It is required that trees are designed and planted in groups for ease of maintenance and a natural aesthetic.
- 13.1.7 Mulch used in shrub and tree groups around stormwater management facilities should be designed and managed in a way to allow for minimal disturbance during flood events.
- 13.1.8 Rock mulch shall not be used within Constructed Wetlands and StormWater Management Facilities. Refer to Specification 02914 Mulches.

- 13.1.9 Planting beds below the 1:5 year flood level present weed control difficulties. They may also present potential erosion difficulties leading to sedimentation of the water body.
- These areas are to be weed and erosion free at CCC and FAC inspections.
 - A siltation barrier is to be installed around the perimeter of the water area, and any erosion material is to be removed and relocated to its original position on a monthly basis between CCC and FAC.
 - Erosion control is recommended around the perimeter of the SWMF, where adjacent lands are bare soil or undeveloped.
 - Within the SWMF, shrub overlap of up to 20% mature size is recommended to encourage a stable weed-free, erosion-free environment. The use of fast growing plant species is encouraged.
 - Weeds are to be removed twice every 28 days and all pulled weeds are to be removed from site immediately.
- 13.1.10 Ornamental planting beds are permitted only above the shared-use path on SWMFs. These ornamental planting beds are to have a minimum depth of mulch as specified Specification 02914 Mulches.
- 13.1.11 Naturalization plantings must be in groups above the 1:5 year storm line if mulch is to be used. Mulch must be 25mm-50mm wood mulch applied loosely and incorporated with native seed mix. Apply one application of mulch at plant installation and allow to decompose during the establishment period.
- 13.1.12 Naturalization plantings can be used below the 1:5 year storm line without any mulch.
- 13.1.13 Major storm sewer outlets and inlets should be landscaped with plant materials and boulders to provide visual screening.
- 13.1.14 Furniture may be provided by the Developer and placed at strategic locations within the Constructed Wetlands and SWMF's in accordance with Section 8.2 Site Furniture and Setbacks, at the discretion of Parks.
- 13.1.15 Special or unique features shall be designed by appropriate professionals and are subject to approval by Parks.
- 13.1.16 The site must be designed to permit access of maintenance vehicles from a public roadway including, but not limited to, water trucks, pruning trucks and man lifts. Reference Volume 2: Complete Streets Construction Detail 5160 Shared Use Path.
- 13.1.17 All SWMFs require a maintenance access; see the City of Edmonton Design and Construction Standards, Volume 3: Drainage, Section 16.11 Maintenance Access Requirements, for specifics. Parks requires inclusion of maintenance access ramps on Landscape Plans for information only.

13.2 Low Impact Development Facilities

- 13.2.1 Vegetation selections for LID facilities should consider two basic soil conditions: a well-drained soil that receives periodic inundation, and a slowly drained soil that is moist to wet for most of the growing seasons.
- 13.2.2 Select plant varieties that will thrive on the site conditions and that grow well together. Species selection should consider:
- Tolerance of seasonal salt loadings depending on facility location;
 - Pollutant uptake capacity;
 - Maintenance needs, including mowing and pruning;
 - Reduction of water and fertilizer needs after establishment;
 - Climate resilience; and,
 - Resistance to pests.
- 13.2.3 See the latest edition of the Volume 3: Drainage Design and Construction Standards, LID Facility Design section for further details and requirements for low impact development facilities.

Appendix A: “Windbreak, Shelter Break Evaluation for Alberta”

SECTION TWO

WINDBREAK, SHELTERBELT EVALUATION FOR ALBERTA

Trees and shrubs planted as windbreaks on the Great Plains have important economic and aesthetic effects, therefore using the cost of establishment and benefits derived and compounded through the years is not realistic. A more realistic value needs to be placed on tree plantings, so that they receive the respect they deserve. A tree with the average life of 100 years that is destroyed at 50 years of age cannot be replaced. Because age is such an important factor, there are two alternatives recommended.

For a belt up to 15 years of age, it is realistic to use the "establishment value". This seems practical because most young shelterbelts can be replaced in a reasonably short time to provide comparable protection. The younger shelterbelts should be valued by determining the establishment cost, plus the cost of annual crop loss, taxes, and other fixed costs of maintaining the land in trees.

ESTABLISHED VALUE

Established value includes costs of land preparation, planting, cultivation and other maintenance for the first five years for "all types of plantings."

A cost of $\$1465 + (.22 \times 1465)$ is estimated for establishing a stand of 1000 trees per hectare. A 4 per cent

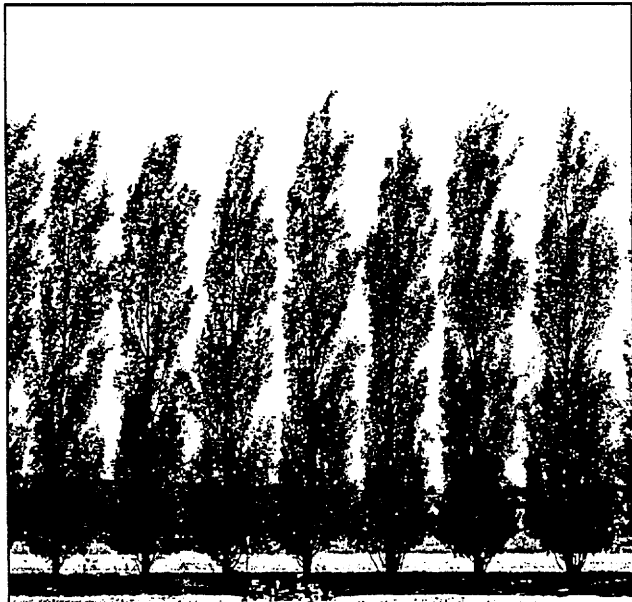


Figure 12. A single row shelterbelt of Tower Poplar is ideal for narrow areas, such as laneways or between fence and buildings.

(.22) interest adjustment is made for five years. It includes preparation costs, planting costs, maintenance for the first five years (estimated to be establishment time). The cost is then \$1.79 per tree.

PROTECTION VALUE

A value for the crop is estimated when protection value is to be determined. This includes present and future benefits to agricultural crops in terms of net yield increase owing to reduced wind and evaporation. Some assumption concerning average crop yield and value are needed to arrive at a monetary value for cropland protection.

To be properly evaluated, a windbreak or shelterbelt must be viewed as a continuous integrated unit. The removal of a single tree or group of trees must be judged as to its effect on the total shelter loss, not on individual tree loss. A scattered group of trees along the fence line of a grain field could be more of a hindrance and removing them may be of benefit to the landowner.

The protected acreage is arrived at by multiplying the length (metres) of the belt by the distance (metres) to which protection extends on one side of the belt. The result is divided by 10,000 (square metres per hectare) to convert to number of hectares protected. The significant protection distance is the average height of tallest trees multiplied by 15.

Example:

Dense shelterbelt 0.8 km (800 m) long and 12 m average height would protect 14.4 ha.

$$\text{i.e. } \frac{800 \text{ m} \times (12 \text{ m} \times 15)}{10,000} = 14.4 \text{ ha}$$

Since the average shelterbelt will grow into a different height class each five years over a 45 year life span, the calculation of protected area must be increased each five years.

Assumptions

The assumptions made to arrive at the basic field value had to be based on average situations. Alberta farmers follow a multi-crop system with various crops being planted over the years. It would be impossible to value the crop on a year-by-year basis. The average prices were based on 1989 grain values.

Example 1. 15-year-old belt with a 7.5 m average height

Age	Height (m)	Years	Protected area for each 0.1 km/ha	Year-Hectare
15	7.5 - 10.5	5	1.4	7.0
20	10.5 - 13.5	5	1.8	9.0
25	13.5 - 15.0	5	2.1	10.5
25-45	15+	20	2.6	52.0
		35		78.5

78.5-year hectares × \$11.75/hectare per year. \$922.38 for each 0.1 km segment appraised. (Protection Value).

Example 2. 25-year-old belt with a 14 m average height

Age	Height (m)	Years	Protected area for each 0.1 km/ha	Year-Hectare
25	13.5 - 15	5	2.1	10.5
25-45	Over 15	20	2.6	52.0
		25		62.5

62.5 year-hectares × \$11.75 per hectare = \$734.38 (Protection Value)

Thus the younger windbreak has a higher protection value than the older windbreak because its protection value is increasing over a longer period of time. A 25-year-old planting can be expected to function for another 20 to 25 years at which time replacement must be made. A 45 year expected life span is average. On good moist land expected life span should be increased to 60 years.

These examples of protection value calculation are for shelterbelts of average or better density, uniformity and continuity. For windbreaks containing many gaps and openings throughout, or for rows of scattered trees the calculated value must be reduced by the number of openings or gaps, e.g., a windbreak with 50 per cent gap will be reduced in value by 50 per cent.

To arrive at the value of native or natural windbreaks, only the protection value is determined and reduced as required. Where native plants (trees/shrubs) are being removed, making homes less "private", compute the protection value and increase by a factor of three. These will be plantings on the east or south of properties where no obvious wind protection is being afforded by the plants. This is a difficult calculation as no cost/benefit is lost with the loss of privacy.

The protection value for farmstead windbreaks (around the farm house and environs) should be valued at five times that of a field shelterbelt. Research has clearly shown that trees and other plants correctly located help conserve energy by providing a cooling effect in summer and a warming effect in winter. Trees positioned to function in this manner are worth more than the same plants situated elsewhere.

Windbreaks can be effective when placed close to buildings, even though maximum wind speed reductions near ground level occur at a distance about five times the height of the tree downwind from the tree barrier. Basically, plants can be placed near buildings to control or guide wind by obstruction, deflection, and filtration.

Example 3.

A 25-year-old farmstead belt 13.5 - 15 m high would be worth \$734.38 × 5 = \$3671.90 for each 0.1 km segment.

The total value then is the establishment value and the protection value on a 0.1 km segment (assuming 170 trees per 0.1 km). For the 25-year-old windbreak the value is \$734.38 + (170 × \$1.79) = \$1038.68. A farmstead belt with the same number of trees then can be valued at \$734.38 × 5 = 3671.90 + 304.30 = \$3976.20 for establishment and protective value.

Most important: professional judgment

Net Value Increase of Protected Area

A basic value of \$11.75/year-hectare protected can be applied to grain and similar annual crops. For forage or range crops, the value is reduced to \$9.40/year-hectare. The basic value × 0.94 can be used.

Basic value adjustments:

Livestock feedlot areas are valued at \$47/year-hectare, and so are concentrated quarters such as dairying operations. Range livestock areas are valued at \$11.75/year-hectare. The basic value × 4 can be used.

Farmstead protection value where buildings and the home are protected is assigned a \$58.75/year-hectare value or × 5 the basic field value. The heating and cooling costs of farm homes and buildings can reduce the heating and cooling cost by 40 per cent with the proper use of trees for windbreaks and shelter.

In situations where more than one protection value may be used, the highest value is to be used in the calculations.

Life Expectancy of Shelterbelt Trees

In the multi-row belt, the longest lived tree is adjudged to be the lifespan that the total belt can reach.

Table 11. Life Expectancy of Trees Planted in Alberta's Shelterbelt

	Average Age	Value
Hedgeplants	50 years	1.1
Small Deciduous	65 years	1.3
Tall Deciduous		
- poplar, willow	30 years	0.75
- maple, ash	60 years	1.2
- oak	75 years	1.4
- birch	40 years	0.8
Coniferous trees	65 years	1.3

Multi-row Factor

Wind and noise reduction is related to the number of rows. The wider the belt, the greater the reduction.

Table 12. Noise Reduction Values of Row

	Value
Single row	1.0
Two rows	1.3
Three rows	1.5
Four rows	1.65
Five rows	1.8

Tree Condition Overall Value

- Above average growth, regular cultivation, maintenance, pruning, thinning, tree replacement..... 1.0
- Average growth, structurally sound, occasional cultivation and pruning; some thinning and removal of dead and diseased trees 0.9
- Decadent and weakened tree growth, no pruning; dead and diseased branches evident 0.8
- No pruning, thinning or removal of dead and diseased branches and trees 0.65

Design

To be effective, the windbreak must be properly designed and planted.

Table 13. Windbreak Design and Orientation

	Value
Ideal design/planting	1.0-1.2
South or east planting	0.8-1.0
Too close to or too far from buildings	0.2- 0.5

Time Adjustment

When destruction occurs and a “replacement is planted”, the time difference is adjusted. The time difference is the age of the destroyed trees less the age of the replacement.

Table 14. Relative Value of Replacement Trees

Difference	Value
0 - 5 years	1.0
6 - 10	1.2
11 - 15	1.4
16 - 20	1.6
21 - 25	1.8
26 - 30	2.0
31 - 35	2.1
36 - 40	2.2
41 - 45	2.5
46 - 50	2.0
51 - 60	1.6
60 +	1.0

Example: A three-row, 15-metre high, 1.2 km long farmstead belt made up of caragana, maple and scotch pine planted in 1955. There is evidence of disease. The belt was well designed and planted on the north and east side with no major breaks or openings. The owner is a grain farmer.

Age	Height	Years	Protected area for each 0.1 km/ha*	Year - ha
35	15 m	5	2.7 (1)	(5 x 2.7) 13.5
35-45	<15 m	10	3.2 (2)	(10 x 3.2) 32.0
		15		45.5

The basic value then is $45.5 \times \$11.75/\text{hectare}/\text{year}$ or \$534.63 for each 0.1 km segment. In this case, 1.2 km is being appraised; therefore, $\$534.63 \times 12$ segments equals \$6,415.50.

Life expectancy	Type of belt farmstead	Rows multirows (3)	Tree condition	Design
1.3	5	1.5	0.8	1.0 x

No replanting is being done. $\$6,415.50 \times 1.3 \times 5 \times 1.5 \times .8 \times 1.0 = \$50,040.90$ * The calculations are: (1) $1200 \times (15 \text{ m} \times 15) : 10,000 \times .1$
 (2) $1200 \times (17.5 \text{ m} \times 15) : 10,000 \times .1$

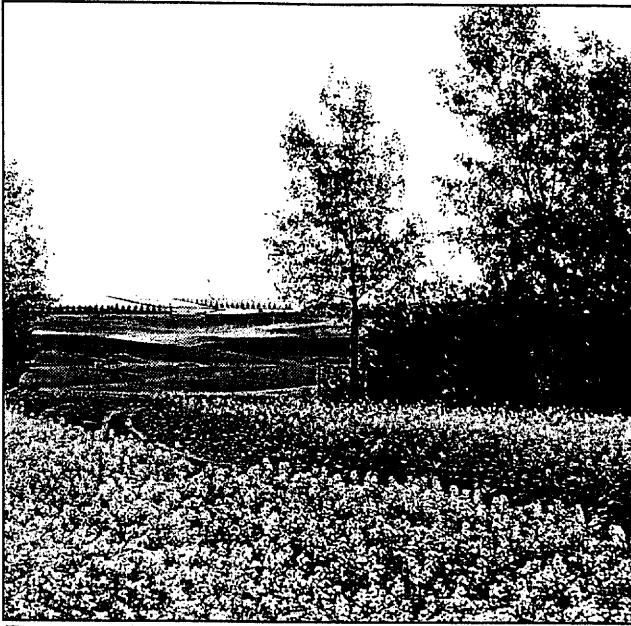


Figure 13. Shelterbelt on left with open spaces and gaps is far less effective than belt on the right.

SECTION THREE

NATURAL TREE AREAS EXCLUDING NATIVE WINDBREAKS

There has been consideration given to the evaluation of native tree cover where there is no obvious shelter given or privacy reduced. The following formula has been developed for determining the actual value of trees that have been destroyed or damaged, or are to be condemned because of land use change. All of the accrued costs are included; intrinsic or sentimental values are not considered. All values are in 1990 dollars.



Figure 14. Typical natural tree line

THE FORMULA CONSIDERATIONS

- To include planting costs, (1800 trees/hectare) based on current wage rates and adjusted for the length of time the planting will take. Also to include land preparation.
- Annual expenses and their amortization for the five year establishment period i.e 4% (.04) used in this calculation or .22 for five years.
- To provide for land replanting rehabilitation. Mainly labor to remove dead or extensively damaged trees, it should include time to burn or dispose of windrows, etc.

$$V = P + \frac{P \times C + 5(E \times C) + L}{R}$$

V = Value of natural planting

P = Planting costs include labor, trees and other costs as well as preplanting land preparation

C = Interest factor

5 = Number of years to establishment

E = Annual expenses, to include taxes, land investment charges, cultivation and other maintenance charges

R = Annual interest rate as a decimal .04 (4%)

L = Land rehabilitation charges where needed

Using the full formula, assume one hectare of tree cover, five-year establishment time for a native site replanted to variety of plants that was disturbed by a oil company laying a pipeline. No fencing (fencing would be added cost based on current fencing rates) is to be done.

P = \$180.00 for planting/hectare

C = .22 interest factor for five years (4% per annum)

E = \$71.15 average yearly costs

Machine work	35.00
Weed control	15.00
Taxes	3.15
Land investment value	
\$500.00/hectare at 4%	20.00
Total	71.15

L = No value as oil company disposed of all debris

$$V = \$180.00 + (180 \times .22) + 5 \frac{(71.15 \times .22)}{.04}$$

$$= \$180.00 + 40 + 1957$$

$$= \$2177.00$$

To this value must be added the cost of the trees for replanting, which will vary according to the variety and source. Do not add value of plants in twice, if already included in determining "P" value, do not add again.

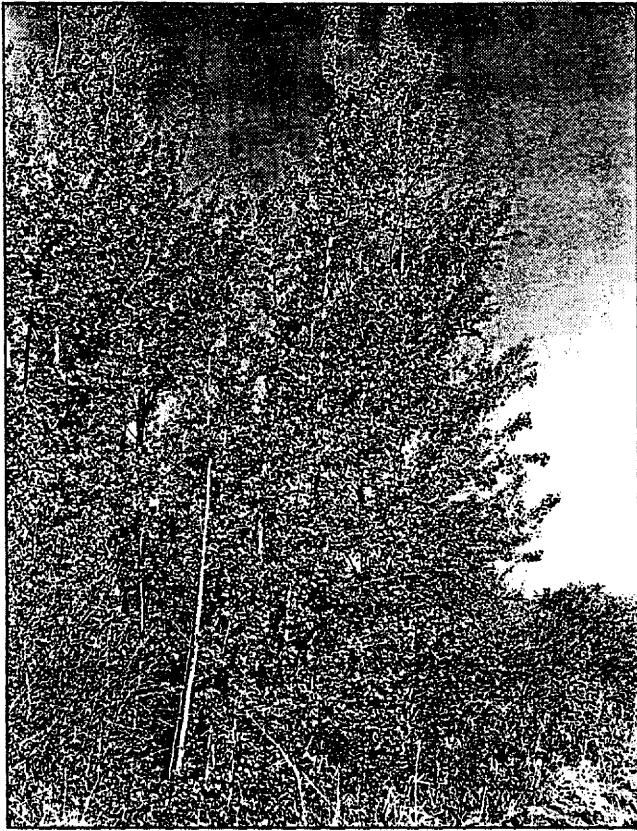


Figure 15. Typical natural area in Southern Alberta has Trembling Aspen as main species.

SECTION FOUR

Farm Woodlots – Harvestable Timber

Trees in farm woodlots that are being grown for timber purposes have a commercial value. Several methods for evaluation are in use. The one used here is based on an Australian method developed by K. J. Simpford in 1979. It provides the most objective initial assessment, although subjective elements may be used for later evaluations.

All trees have wood fibre, which has some potential market value. The method used here offers a good starting point for an evaluation.

Assumptions used are:

- Equivalent value of forest harvest trees to woodlot value is about \$40.00/m³ (Pulpwood value is about 1/3 to 1/4 of that value).
- The simplest relationship to define tree volume is $D^2 H/3$ (D = diameter; H = Height, both in metres). This gives a relative index of volume for a single-stemmed tree.

A 20-year-old white spruce that is 20 cm in diameter and 25 m tall would have a potential mill value of about \$13.60. This value would be realized for a tree in the peak range, in Alberta for most lumber species that is a tree between 20 and 30 years old.

The value added by annual growth to the market value of timber is comparable to a compound interest curve. One can express the relationship of plant growth to present value in 10-year increments so that a compound interest table can be used to establish the multiplying factor. Assuming that the most attractive mill tree reaches maturity at 40 years of age, the calculated basic value would be a 1 per cent increase in base value for each year over 20 years, i.e., for a 40-year-old white spruce the age factor would be 1.22, which is the compound interest at 1 per cent for 20 years.

Accepting that, the general average increase in value for farm woodlots is 11.5 times over twenty years, which is roughly 13 per cent interest compounded annually.

Here is an example:

1. Initial value, if planted, \$10.00.
2. This cost to 20 years at 13 per cent gives a value of \$156 plus the \$10 initial value for a \$166 total value. For trees that are less than 20 years old, use a compound interest table at 13 per cent for the age of the plant.

3. The tree in this example is 20 years old. In Alberta conifer trees add growth at the rate shown in Table 15.

Table 15. Conifer Growth Rate in Alberta

Total growth (%)	Years
70	20-30
60	30-40
50	40-50
35	50-60
25	69-70

The 20-year-old tree increases the value of \$166 by 70 per cent or \$116 for the 30-year value, and \$166 by 60 per cent or \$100 for the 40-year value (attractive mill tree age)

The 40-year value then is $\$166 + \$116 + \$100 = \382 .

This example assumes that care and maintenance is sufficient to produce a straight single-stem tree suitable for dimension lumber. If not, the value (\$382) drops to 1/3 or 1/4 if the use of the plant is pulpwood only. In this example that value would be \$127 or \$96.

This evaluation assumes no aesthetic or shelter value, if these are to be considered the specimen value or shelterbelt value should be used.

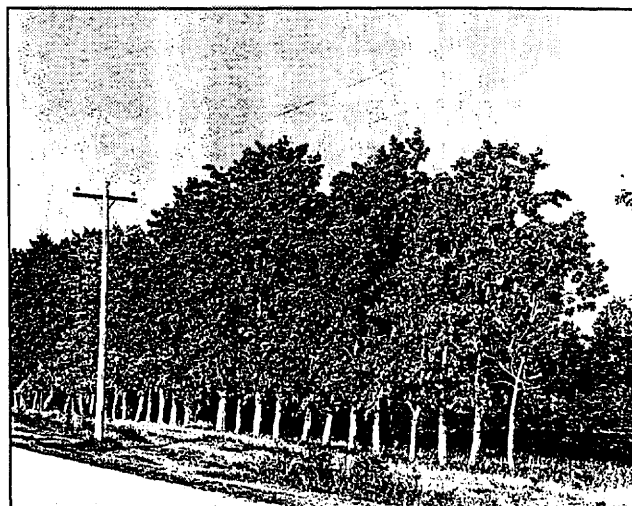


Figure 16. Farm woodlots need continued maintenance such as pruning to promote straight knot free stems.

SECTION FIVE

Municipal Tree Stands

There are certain situations when the value of tree stands cannot be effectively or efficiently calculated by any means. The stand may have numerous individual stems, the area may have no defined use such as wind protection of an identifiable subject, and/or there maybe a wide range of age condition or species within the stand.

This problem has been confronted by the City of Edmonton Parks group. Mr. K. Evans and some of his staff from the City of Edmonton have developed a formula and the methodology for evaluating these kinds of tree stands. It has been altered here by inserting the "cooling value" as determined by the shade provided by the canopy. To obtain the cooling value one needs to determine the percentage difference in shade from full sunlight to the shade provided by the stand. This measurement can be taken with a simple light meter. John Parker in *Landscaping to Reduce the Energy Used in Cooling Buildings* quantified the value of shade by measuring the reduction in electrical requirements for air conditioning on warm summer days. Parker reported that Fizzell measured the energy consumption for air conditioning and found the greatest consumption is from 11:00 a.m. to 3:00 p.m. which is the highest overheating period.

Trees and other plant material have the ability to lower free air or ambient temperatures by evaporative cooling and by absorbing and deflecting solar heat. Natural cooling occurs as water evaporates from the leaves. The cooling effect of one mature tree such as a cottonwood or elm has been calculated to equal five 10,000-BTU air conditioners. The use of electricity can be calculated using Trans-Alta's residential consumer rate for electricity @ .004¢/BTU /hr. In this case six hours of cooling (from 10:00 a.m. to 4:00 p.m.) time has been used. As the density of the crown providing shade increases, the value of the shade grows exponentially. The following table provides the factors and their definitions.

Table 16. Cooling Values (CV)

Shade Difference* (%)	Value	Comments
50	1.0	Trees in an open area with less strongly defined crowns. Such as young stands or older decaying stands of poplar.
60	1.2	Shade provided by a mature evolving trembling aspen stand.
70	1.5	Typical mixed stand of poplar (aspen) and conifer.
80	1.9	Heavy shade as provided by dense conifers.

*Shade difference: determined by meter difference from bright sunny weather to shaded area.



Figure 17. Natural sites have a variety of trees giving various shade densities. The shade has value to the child and the environment.

To ensure accuracy, readings should be taken on a sunny day between 10:00 a.m. to 4:00 p.m. Once competence has been gained visual determination should be accepted from competent professionals.

For simplicity of calculation the appraiser has to define and determine which range a particular stand falls into, e.g., if a stand measures 75 per cent shade and the representative count indicates a higher number of conifers the value would be 1.9.

A minimum of three readings are necessary:

- shade at fringe,
- deep shade as from species or deep within stand,
- measurements from two representatives species (if available).

Remaking the City of Edmonton formula, the calculation proceeds as follows:

$$V = (P_{te} + P_t F_v + M_c + L_r) CV$$

V = Value of existing stand

P_{te} = Total number of trees of each kind

P_t = Total planting cost of all species

$$P_t = P_1 + P_2 + P_n$$

$$P_1 = P_c \times S_f \times C_f \times N$$

P_c = unit planting cost/tree/size category, the least number of size grouping comparisons from stand to unit tree cost is preferable to reduce calculation volume, e.g., stem size categories (0 to 2.5 cm, 2.5 to 7.6 cm, 7.7 to 15.2 cm, and over (15.3 cm). This value will vary from municipality to municipality.

S_f = species factor: from appendix 1.

C_f = condition factor: from condition table, use representative selections and use an average for calculation.

$P_1 + P_2 + \dots P_n$ = number of trees: use representative number again from a grid pattern, aerial photos would assist greatly, also obtain stem numbers.

N = number of trees of same species.

F_v = the interest of future value, for only those being removed. To be consistent with other examples in this book the value used here is 4 per cent over five years of establishment.

$$F_v = (P_t \times C)$$

$$C = .22$$

For 3 years $C = .13$ @ the 4 per cent rate.

M_c = maintenance to include

- watering for five years
- staking and removal of stakes
- pruning if done
- replacement value; generally 10 per cent taken of planting costs.

Elsewhere in this publication the value \$71.15 per year has been used as in this example.

$$M_c = \frac{5(71.15 \times .22) + 10\% P_t}{.04}$$

L_r = land rehabilitation charge

- in most cases equals zero
- assumes a value only if replanting is on same site.

CV = cooling value from Table 16

$$V = P_t + (.22 \times P_t) + \frac{5(\$71.15 \times .22) + .10 P_t + L_r}{.04} CV$$

E.g., a hectare of maturing aspen with the odd white spruce (less than 1%) is being removed for development. Condition is good to excellent with limited re-growth. There are two stems greater than 3 cm/10 m², four stems greater than 7 cm/10 m² and one stem greater than 15cm/10 m². The municipality's cost of planting: 2.6 to 7.6 m is \$175.00, 7.6 cm or more is \$360.00 including cost of trees. Replanting will be done at another sight to replace the removed canopy.

Aspen Stems

@ 3cm	=	200 stems
@ 7cm	=	400 stems
@15cm	=	100 stems
		<u>700 stems</u>

Spruce Stems

@15cm	=	70 stems (minor)
		<u>770 stems</u>

$$P_t = P_1 + P_2 + \dots P_n$$

$$P_1 = P_c \times S_f \times C_f \times N$$

$$P_t =$$

$$P_1 = \$175 \times .6 \times .7 \times 200 = 14,700$$

$$P_2 = \$360 \times .6 \times .7 \times 400 = 60,480$$

$$P_3 = \$360 \times .6 \times .6 \times 100 = 12,960$$

$$P_4 = \$360 \times .8 \times .8 \times 70 = 16,128$$

$$= 14,700 + 60,480 + 12,960 + 16,128$$

$$= 104,268$$

CV = 1.2 for this example

$$V = (104,268 + (104,268 \times .22) + \frac{5(71.15 \times .22) + (10\% \times 104,268)}{.04}) 1.2$$

$$= (104,268 + 22,939 + 1,957 + 10,467) 1.2$$

$$= \$167,509.$$

It would cost the municipality \$240,200 to replace the stand with trees that would, over time, provide the same condition as the existing stand.

If this stand of aspen was valued as pulpwood its dollar value would be (\$88,900 or 700 × \$127) without replanting costs. Adding the value of the spruce for lumber (\$382 × 70 = \$26,740) the total value of the aspen and spruce becomes \$115,640.

**Appendix B: “Top of Bank Policy C542A, Development Setbacks from River Valley/ Ravine
Crests”**



CITY POLICY

POLICY NUMBER: C542A

REFERENCE:

City Council 26 February 1985
City Council 11 October 2016

ADOPTED BY:

City Council
17 February 2010

SUPERSEDES:

Top-of-the-Bank Public Roadway
Policy

PREPARED BY: Sustainable Development

DATE: 28 September 2016

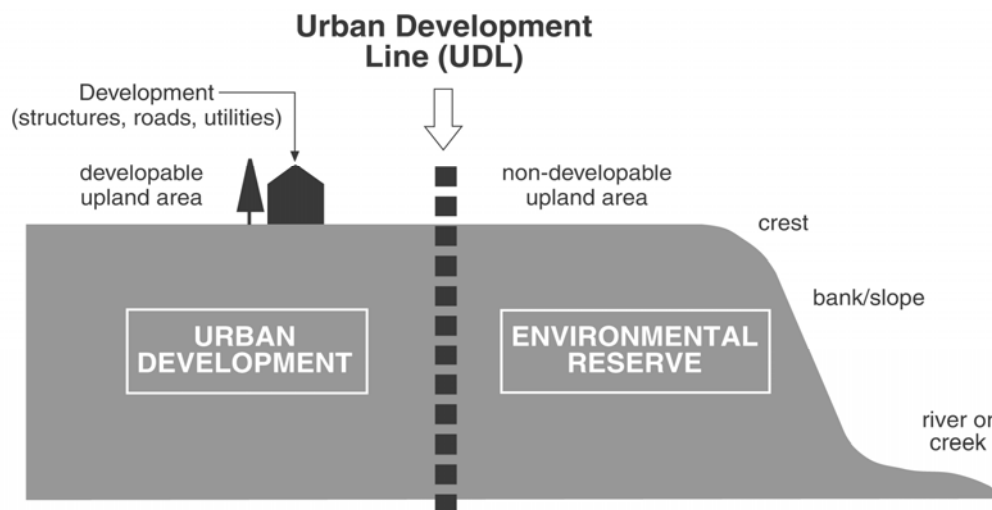
TITLE: Development Setbacks From River Valley/Ravine Crests

Policy Statement:

To many residents, the North Saskatchewan River Valley and Ravine System is Edmonton's finest feature. Preservation of and public access to it are key to our quality of life. The City requires that design of development in all new or redeveloping areas abutting the River Valley and Ravine System provide for the separation of development from the river valley or ravine as generally illustrated in Figure 1, and as further described in the following Policy and Procedures. This separation shall be created through establishment of a scientifically-derived Urban Development Line demarcating the boundary between developable upland area (urban development) and non-developable upland area or Environmental Reserve. Further, this separation shall be accomplished by such other legal, planning and technical measures necessary to achieve the purpose of this Policy. The only exception shall be in the Downtown and existing river valley communities where development has already occurred either on the slope or in the floodplain of the River Valley and Ravine System.

Figure 1

Urban Development and Environmental Reserve



Note: See Policy Definition 1.32 for a more precise definition of Urban Development Line.



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The purpose of this policy is to:

1. Ensure that urban development is reasonably safe from environmental hazards, such as slope instability and failure, flooding or fire that may result in loss to persons and property.
2. Protect the River Valley and Ravine System from urban development that may compromise its integrity and long term stability.
3. Maximize access for local residents and the general public to a continuous circulation system along the entire length of the Upland Area Abutting the River Valley and Ravine System. Public access is provided for circulation and amenity purposes, connection to the park system within the River Valley and Ravine System, slope repair and geotechnical monitoring, fire fighting, emergency and public safety, drainage control, and for dealing with encroachment issues.
4. Ensure preservation of the River Valley and Ravine System as a significant visual and natural amenity feature, contributor to the ecological functionality of the City's natural areas system, and recreational opportunity for the citizens of Edmonton.



CITY POLICY

1. OBJECTIVES AND DEFINITIONS

The following preconditions and definitions are specific to this Policy and implement the four objectives outlined in the purpose of this policy. Definitions used are capitalized. The preconditions and definitions are then applied to "Procedures" which explain how and when the Policy will be implemented.

OBJECTIVES

Ensure that urban development is reasonably safe from environmental hazards, such as slope instability and failure, flooding or fire that may result in loss to persons and property.

- 1.01 A number of measures shall be undertaken to ensure the reasonable safety of urban development.

An assessment of environmental hazards shall be conducted within lands **Abutting the Crest**. The study area shall be established as a function of the slope height or vertical distance between the Crest and **Toe of the Slope**.

The **Estimated Long Term Line of Stability** shall be the primary scientific methodology for determining slope instability and failure. An **Urban Development Line**, which primarily delineates developable and non-developable land, shall be established on the **Upland Area**.

Fire risk shall be considered in the context of the **Wildland/Urban Interface** and evaluated under the **Wildfire Hazard Assessment System**.

For **Major Slopes** where the geotechnical assessment identifies landslide hazards or areas deemed to be of higher geotechnical risk, a **TOB Roadway** shall be the predominant form of urban development used.

- 1.02 The City shall register a **Restrictive Covenant** by way of a caveat on the title of properties backing onto the top of bank, describing building restrictions and other restrictions necessary to protect both urban development and the **River Valley and Ravine System**.

- 1.03 Reasonable compensation shall be provided to an owner required to develop a TOB Roadway. This compensation is to offset higher servicing costs and lost development opportunities associated with a TOB Roadway. The area of the TOB Roadway right of way and any residual land between the roadway and the Urban Development Line shall be deducted from the gross area at the time of subdivision to reduce the municipal reserve entitlement for the affected lands. This residual land shall be incorporated and maintained as part of the adjoining open space. Unless otherwise provided for by the City, the TOB Roadway shall adhere as closely as possible to the Urban Development Line.



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Protect the River Valley and Ravine System from urban development that may compromise its integrity and long term stability.

- 1.04 The previously mentioned assessment of environmental hazards and the determination of a development boundary shall describe lands that are not developable for urban development on the Upland Area.
- 1.05 The River Valley and Ravine System shall be protected through the City's taking of **Environmental Reserve** at the time of subdivision. TOB Restrictive Covenants shall enshrine additional development restrictions to protect top of bank lands and the valley slopes based on the technical recommendations provided in the geotechnical assessment report. A TOB Roadway and protected greenspace with fronting-on top of bank development shall provide a further measure of protection in comparison to backing-on development.

Maximize access for local residents and the general public to a continuous circulation system along the entire length of the Upland Area Abutting the River Valley and Ravine System. Public access is provided for circulation and amenity purposes, connection to the park system within the River Valley and Ravine System, slope repair and geotechnical monitoring, fire fighting, emergency and public safety, drainage control, and for dealing with encroachment issues.

- 1.06 A number of measures shall be undertaken to maximize public access for local residents, the general public, and civic purposes. Planning for public access begin at the area structure plan level to ensure strong neighbourhood connectivity. Much of the technical assessment will be done at the neighbourhood planning level. Public access is maximized when it is based on barrier-free design, highly visible, safe, readily accessible, connected, uninterrupted, open to multi-use, and ensures vehicle parking and roadway access (where necessary). **Wayfinding** and **Crime Prevention Through Environmental Design (CPTED)** principles improve the quality of public access.

Public access shall be provided along the entire TOB for circulation, amenity, and civic purposes. Public access will be accommodated through a combination of TOB Roadway and **TOB Walkway**. The walkway will be situated on lands preferably designated as Environmental Reserve and will be provided along the entire length of the Upland Area, subject to the technical specifications identified in the geotechnical assessment report.

- 1.07 Public access to a TOB Walkway from a public roadway shall accommodate **Public and Emergency Access** in order to encourage public access for circulation and amenity purposes, and to provide appropriate access for fighting wildland fires.
- 1.08 The area abutting a minimum of 30% of the Urban Development Line shall be comprised of either a TOB roadway or land use for municipal purposes (e.g. park) in new plan areas to ensure the objectives of this policy are achieved and to address the following factors:



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- (a) Major Slopes where geotechnical assessment identifies areas deemed to be of higher geotechnical risk;
- (b) Public access that ensures curbside parking spaces for public parks and access into the River Valley and Ravine System;
- (c) A combination of continuous, uninterrupted public access (i.e. Roadway and Walkway) along the entire TOB interface;
- (d) Civic needs including (but not limited to) geotechnical monitoring and repair, drainage management, fire fighting, and public emergency access;
- (e) Public access for circulation and amenity purposes to outlying areas within the city;
- (f) Visual Connection with the River Valley and Ravine System, Wayfinding and Crime Prevention Through Environmental Design (CPTED) within a neighbourhood;
- (g) Public access to Vistas and Views along the TOB; and
- (h) Ecological separation (i.e. buffer) from urban development and private encroachment.

Additional TOB Roadway may be required to achieve the aforementioned factors based on final technical and planning assessments and recommendations. In particular, additional TOB Roadway or alternatively, additional setbacks shall be incorporated in those areas, identified by Administration, with significant Vistas or Views to facilitate the provision of public promenade amenities and access.

Findings and recommendations from both technical studies and assessments will be used to inform TOB Roadway design at the neighbourhood level.

The TOB roadway requirement shall be measured as a percentage of the entire length of the Urban Development Line. The TOB Roadway shall be generally coterminous with the urban Development Line and shall be measured as set out in Schedule A. Where additional land is taken beyond the Urban Development Line for municipal purposes fronting on a top of bank roadway (e.g. park), the calculation shall include the length of the Urban Development Line used for that purpose and shall be measured as set out in Schedule B.

Ensure preservation of the River Valley and Ravine System as a significant visual and natural amenity feature, contributor to the ecological functionality of the City's natural areas system, and recreational opportunity for the citizens of Edmonton.

- 1.09 Coordination of relevant City policies and plans such as the Natural Area Systems Policy C531, Urban Parks Management Plan, Ribbon of Green, the North Saskatchewan River Valley Area Redevelopment Plan, and A Plan of Action for the Capital Region River Valley Park with top of bank development shall begin at the area structure plan level to ensure strong planning integration below and above the top of bank. Much of the technical assessment will be done at the neighbourhood planning level.



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- 1.10 A number of measures shall be undertaken to enhance the visual appreciation and experience associated with the River Valley and Ravine System. Identification of **Vistas and Views** along with a strong **Visual Connection** (e.g. **View Corridor**) to the River Valley and Ravine System shall begin at the area structure plan level to ensure a high quality of public access. Much of the technical assessments will be done at the neighbourhood planning level.
- 1.11 **Ecological Network** function, design, and mechanisms for acquiring lands within the Upland Area for conservation shall be identified through Ecological Design Report in the preparation of future statutory and non-statutory land use plans.
- 1.12 This policy and the North Saskatchewan River Valley Area Redevelopment Plan work together to ensure that appropriate boundaries on the slopes and top of bank or Upland Area are identified to preserve the River Valley and Ravine System.
- 1.13 The City will work with property owners and developers of lands adjacent to and/or wholly or partially within the North Saskatchewan River Valley and Ravine System to acquire lands necessary to achieve relevant municipal planning objectives. Where possible, the City will encourage and promote the donation of all or a portion of these lands through innovative measures such as, but not necessarily limited to, income tax receipts (i.e. split receipting) for eco-gifts, environmental reserve easements, transfer of development rights, eco-trusts and non-credit municipal reserve dedication.



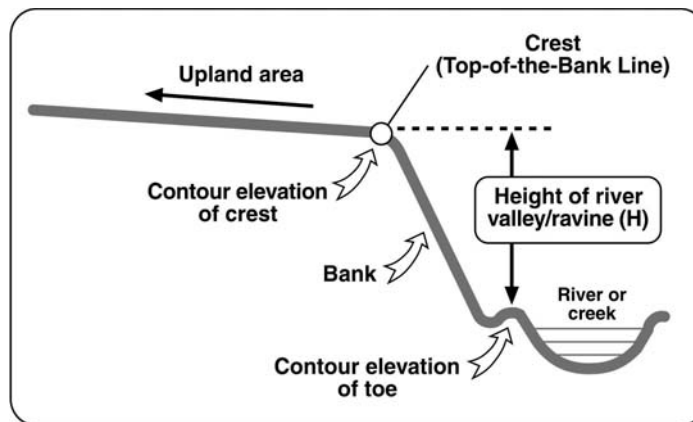
CITY POLICY

DEFINITIONS

- 1.14 **Abutting** means the top of bank area within a distance deemed close enough to the river valley or ravine crest to require an environmental hazards assessment. This is determined by the horizontal distance along the upland area equal to eight times the slope height, taken as the difference between the geodetic elevation of the crest and toe of the slope. See Figure 2.

Figure 2.

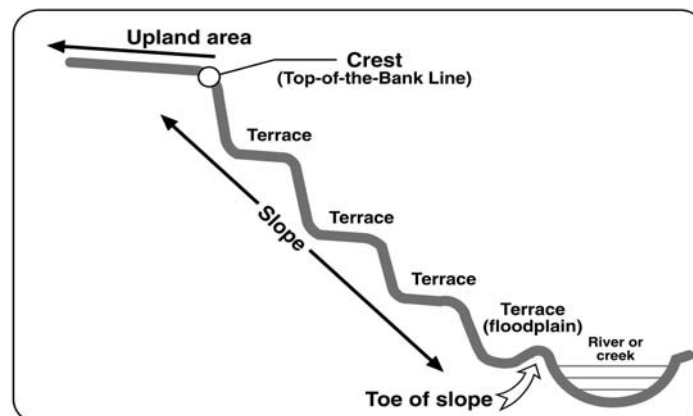
Abutting



- 1.15 **Crest** means the dividing line between the slope and its Upland Area. The Crest is also referred to as the top-of-the-bank (TOB) line. Where the river valley or ravine contains several terraces, the Crest is the valley break, slope edge or distinct topographic change between the Upland Area and the River Valley and Ravine System. The Crest is used to determine the area of study for the environmental hazards assessment, as well as to determine the minimum Public Upland Area Setback. See Figure 3.

Figure 3.

Crest





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- 1.16 **Crime Prevention Through Environmental Design (CPTED)** means the design and effective use of the built environment to reduce fear and incidence of crime while improving overall quality of life.
- 1.17 **Ecological Network** means a coherent system of natural and/or semi-natural landscape elements that is configured and managed with the objective of maintaining or restoring ecological functions as a means to conserve biodiversity. Edmonton's Ecological Network structure includes:
- (a) Regional Biodiversity Corridor – The North Saskatchewan River Valley is the most critical component for wildlife movement and ecological processes in Edmonton;
 - (b) Biodiversity Core Areas – Natural areas large enough to support entire populations of different species and may also serve as an important linkage;
 - (c) Linkages – Non-linear stepping-stones and linear ecological corridors provide structural and or functional connections between biodiversity core areas and the regional biodiversity corridor. These may take the form of either natural linkages (i.e. sites dominated by naturally occurring patterns of native vegetation such as natural areas, naturalized parks or stormwater facilities) or semi-natural linkages (e.g. sites with more manicured green space such as active recreation parks, cemeteries, schoolyards, non-naturalized stormwater facilities or public rights of ways); and
 - (d) Matrix – Background ecosystems or land uses within which habitat patches (core areas and linkages) lie on a landscape (e.g. sites found within agricultural, residential, commercial and or industrial lands that contribute to the overall habitat and or level of connectivity within the Ecological Network.
- 1.18 **Environmental Reserve** means land (as per Section 664(1) of the *Municipal Government Act*) that consists of:
- (a) Swamp, gully, ravine, coulee or natural drainage course;
 - (b) Land that is subject to flooding or is, in the opinion of the subdivision authority, unstable; or
 - (c) A strip of land, not less than six metres in width, abutting the bed and shore of any lake, river, stream, or other body of water for the purpose of:
 - (i) Preventing pollution, or
 - (ii) Providing public access to and beside the bed and shore.

Section 671(1) of the MGA states that Environmental Reserve must be left in its natural state or be used as a public park. Under Section 676 of the MGA, a council may, by bylaw, after giving notice in accordance with Section 606 and holding a public hearing in accordance with Section 230, use an Environmental Reserve for a purpose not specified in Section 671(1). Notwithstanding Section 671, roads, public utilities, and oil and gas pipelines or transmission lines may be placed on reserve land.



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Environmental Reserve, as illustrated in Figures 1, 4, 5, 6, 7 and 8 is further explained by this Policy and demarcated generally by the Urban Development Line, to include:

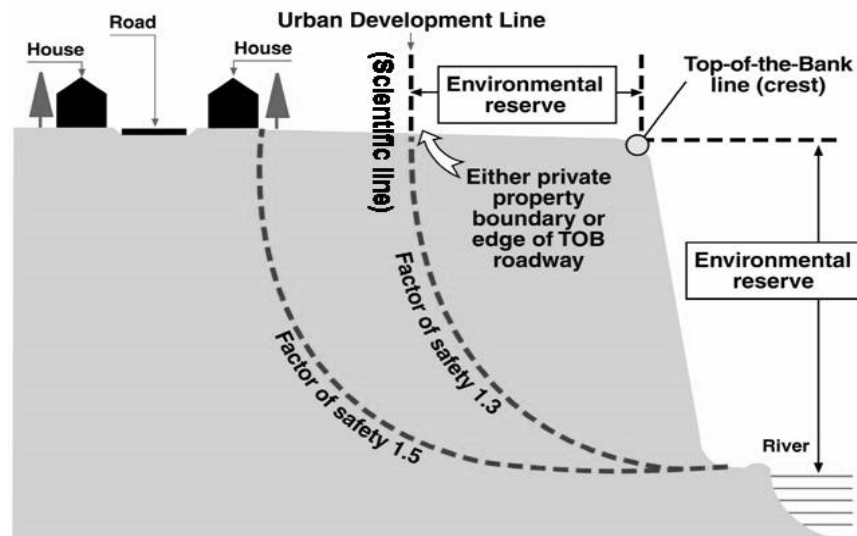
- (a) The upland area that is unstable and non-developable due to slope instability or other physical conditions as identified in the geotechnical assessment report and characterized by the Estimated Long Term Line of Stability;
- (b) The Upland Area that is non-developable due to other environmental hazards such as flooding and subsidence or ground collapse due to mines, excavations or sinkholes;
- (c) Any other land contemplated as Environmental Reserve under the Municipal Government Act, whichever is the greater.

1.19 **Estimated Long Term Line of Stability** means the line demarcating the transition between 'stable' and 'unstable' Upland Areas relative to the Abutting river valley or ravine slopes. This line is an estimate of the Upland Area not expected to undergo movement (i.e., slumping, settling, creeping or sloughing) for a period of time and is determined by a combination of the minimum estimated long term factor of safety and future instability factors.

The Estimated Long Term Line of Stability is determined using slope stability analysis and engineering assessment adopting a minimum long term factor of safety. The development setback associated with the adopted minimum long term factor of safety is intended to provide a margin of safety for the development of roads, infrastructure, and buildings in proportion to the potential for loss to property and loss of life. See Figure 4.

Figure 4.

Estimated Long Term Line of Stability/Urban Development Line



Note: See Policy Definition 1.32 for a more precise definition of Urban Development Line.



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The analysis and assessment of the Estimated Long Term Line of Stability also allows for future instability factors. Future instability factors include such considerations as: the estimated toe erosion over a period of 150 years; the anticipated increase in groundwater levels in a developed urban drainage basin; any anticipated or planned removal of vegetation; any planned placement of fill, re-grading, or related changes in surface water regime; and any instability associated with other physical conditions, such as mines excavations and sinkholes, where applicable. All relevant future instability factors are to be considered over a period of at least one life cycle of development or the estimated life expectancy of the structure.

In 'fronting on' TOB development situations, where there is a TOB Roadway, a minimum estimated long term factor of safety of 1.3, incorporating future instability factors, is used to establish the boundary of the road right-of-way abutting the non-developable Upland Area. This boundary will be deemed to be the Urban Development Line where it is greater than the setback required for other environmental hazards or the minimum Public Upland Area Setback.

In 'backing on' TOB development situations, where there is no TOB Roadway, a minimum estimated long term factor of safety of 1.3, incorporating future instability factors, is used to establish the rear property line for development. This boundary is deemed to be the Urban Development Line where it is greater than the setback required for other environmental hazards or the minimum Public Upland Area Setback. A minimum estimated long term factor of safety of 1.5, incorporating future instability factors, is used to establish the rear foundation of any primary dwelling or structure.

Based on engineering assessment consistent with the current local state of practice in geotechnical engineering, the recommended setback lines for development and structures shall be determined by the Geotechnical Engineer, and shall be in accordance with the concept of an Estimated Long Term Line of Stability. The recommended development setback lines shall also be suitably documented as part of the geotechnical report submitted for review by the City. The role of the Geotechnical Engineer through their judgment and experience in understanding the site-specific issues and geological setting, and in recognizing the complexities of geotechnical behaviour and the inherent limitations in models and theories, is of considerable importance. The management of geotechnical risk is distributed amongst the many aspects of the overall investigation, analyses and engineering assessment.

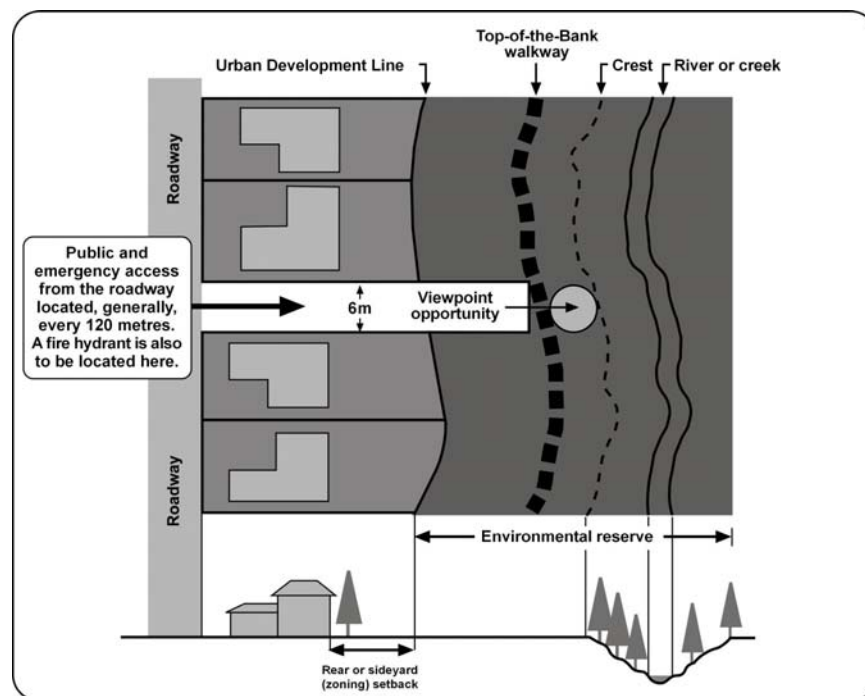
- 1.20 **Major Slope** means a slope with inclination greater than 15 degrees and height greater than 10 metres. For non-uniform slope geometries, a Major Slope shall also be indicated by the presence of any intermediate portion of the slope, with inclination greater than 15 degrees and height greater than 10 metres, between two areas of different slope angle.
- 1.21 **Minor Slope** means a slope with inclination less than 15 degrees and height less than 10 metres.



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- 1.22 **Moderate Slopes** means slopes with inclination greater than 15 degrees but having height less than 10 metres.
- 1.23 **Natural Areas** means an area of land or water dominated by native vegetation and relatively undisturbed by human activity. Such areas could include grasslands, forests, wetlands, peatlands or riparian areas. Areas such as groomed parks, sports fields and schoolyards are not natural areas.
- 1.24 **Public and Emergency Access** means public access from a roadway to a TOB walkway for both public circulation and emergency access. This access is designed to allow a higher level of pedestrian and vehicular access limited to emergency vehicles, a hard surfaced multi-use trail within a connected right-of-way that accommodates a fire hydrant. The spacing of this access is, generally, at regular intervals of 120 metres. See Figure 5.

Figure 5.
Public and Emergency Access with Backing On TOB Development



Note: See Policy Definition 1.32 for a more precise definition of Urban Development Line.

- 1.25 **Public Upland Area Setback** means the minimum upland area that is setback from the crest in order to provide for public access, circulation, and civic purposes including geotechnical monitoring and repair, fire fighting, emergency and public safety, drainage control, and dealing with private encroachment issues. A TOB Roadway shall not be located within the setback area. The minimum public upland area setback shall be a minimum 10 metres to 15 metres.



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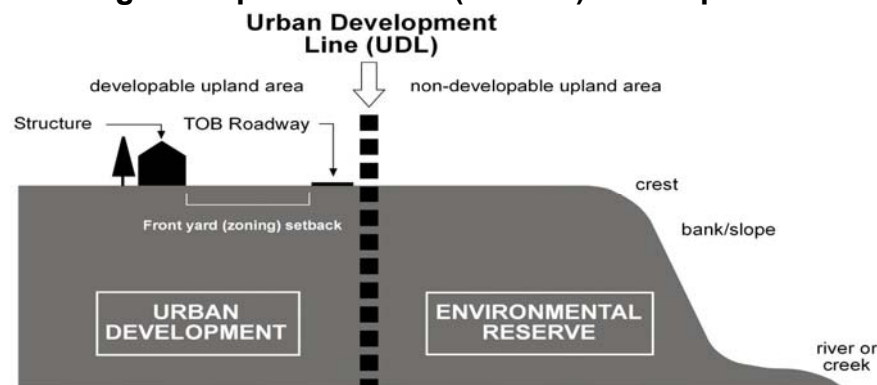
- 1.26 **Restrictive Covenant** means a legal instrument entered into by the property owner and the City which contains terms and restrictions on the use of the property which the property owner must abide by and may include the following:
- (a) That the City of Edmonton is not liable for any damages resulting from bank instability, failure or any other environmental hazards;
 - (b) Restrictions pertaining to the required setbacks for development and structures, site grading and fill placement, surface drainage, slope protection and the maintaining of existing vegetation;
 - (c) Restrictions that prohibit the construction or installation of swimming pools, ornamental ponds or similar water retention structures, as well as permanent sprinkler or irrigation systems, and other restrictions pertaining to water management and special drainage systems, and;
 - (d) A restriction based on the recommended guidelines for Priority Zone 1, from “FireSmart: Protecting your Community from Wildfire.”

The Restrictive Covenant will apply to property on or abutting to the Upland Area. The Restrictive Covenant is applied as a subdivision condition.

- 1.27 **River Valley and Ravine System** means the existing or former North Saskatchewan River and its tributary creeks, including the slope or bank up to the Crest.
- 1.28 **Toe of the Slope** means the lowest point of the river valley or ravine in cross section. The Toe of the Slope shall be used in the determination of the area of study for the environmental hazards assessment. See Figure 2.
- 1.29 **Top-of-the-Bank (TOB) Roadway** typically means a public vehicular roadway situated on the developable Upland Area adjacent and generally parallel to the Urban Development Line or the Public Upland Area Setback, whichever is the greater. In addition, a TOB Roadway may be further setback from the Urban Development Line on the developable Upland Area to accommodate public development such as stormwater lakes or parks. See Figure 6.

Figure 6.

Fronting On Top-of-the-Bank (FOTOB) Development Situation



Note: See Policy Definition 1.32 for a more precise definition of Urban Development Line.

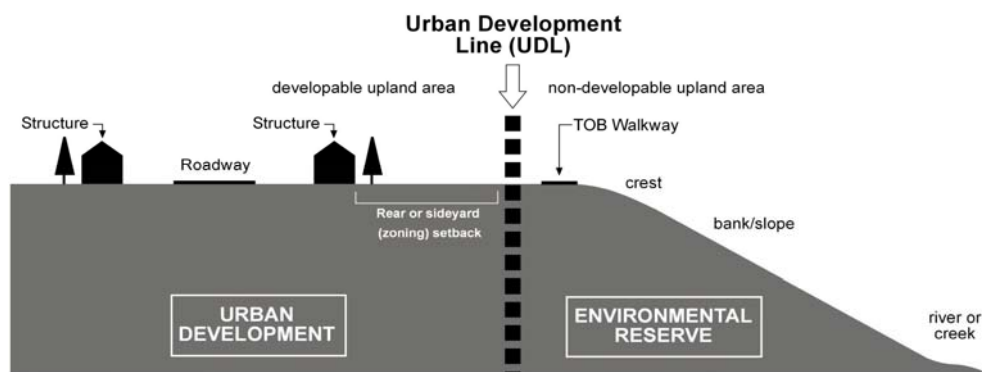


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- 1.30 **Top-of-the-Bank (TOB) Walkway** means a public walkway situated within the Upland Area, on the river valley/ravine side of the Urban Development Line, and aligned approximately, parallel to the adjacent Crest. This walkway will be situated on lands preferably designated as Environmental Reserve where technically feasible and provided along the entire length of the Upland Area. See Figure 7.

Figure 7.

Backing on Top-of-the-Bank (BOTOB) Development Situation



Note: See Policy Definition 1.32 for a more precise definition of Urban Development Line.

- 1.31 **Upland Area** means the generally flat land located above the valley break, escarpment or Crest of the river valley or ravine. See Figures 2 and 3.
- 1.32 **Urban Development Line** generally means the line demarcating the transition between lands suitable for urban development and non-developable land such as Environmental Reserve on the Upland Areas Abutting the River Valley and Ravine System. In calculating the Urban Development Line for new urban development requiring subdivision, this Line will generally take the greater of the environmental hazard risk due to slope instability and failure as determined by the Estimated Long Term Line of Stability, subsurface conditions such as mines, excavations or sinkholes, or flooding or any other lands contemplated as Environmental Reserve under the Municipal Government Act.

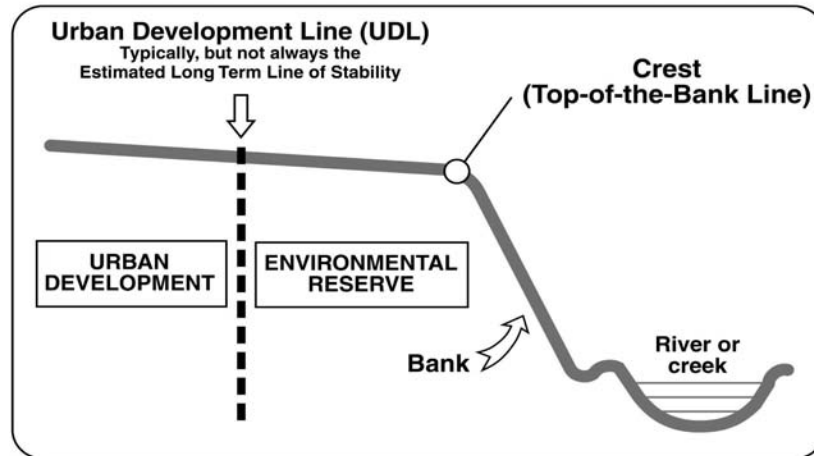
The Urban Development Line shall generally be used to measure setbacks for structures as well as the TOB Roadway requirement in new plan areas or as otherwise specified in this policy. Where the minimum Public Upland Area Setback is greater than the Urban Development Line, the Urban Development Line will be adjusted to reflect the greater setback. A TOB roadway shall not be located in this Public Upland Area Setback. See Figures 1, 4, 5, 6, 7 and 8.



CITY POLICY

Figure 8.

Urban Development Line (UDL)



- 1.33 **View Corridor** means the line of sight identified as to height, width, and distance of an observer looking toward an object of significance to the community. For the purpose of this policy, the principal View Corridor will be environmental where the River Valley and Ravine System contains unique natural features to Edmonton that should be preserved for education and passive recreation.

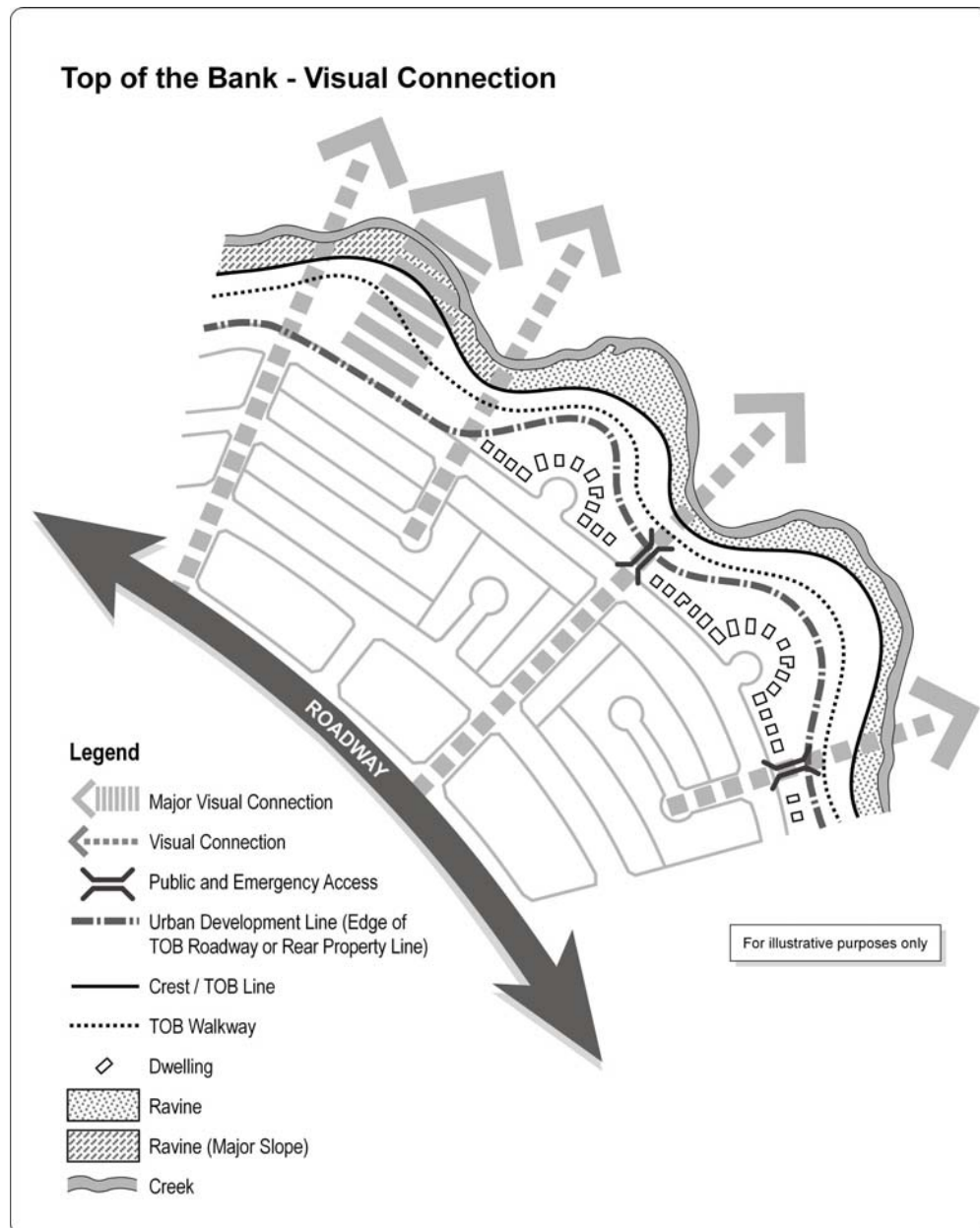


CITY POLICY

1.34

Visual Connection means the cumulative visual experience and relationship between the Upland Area and River Valley and Ravine System perceived by an observer. See Figure 9.

Figure 9.
Visual Connection



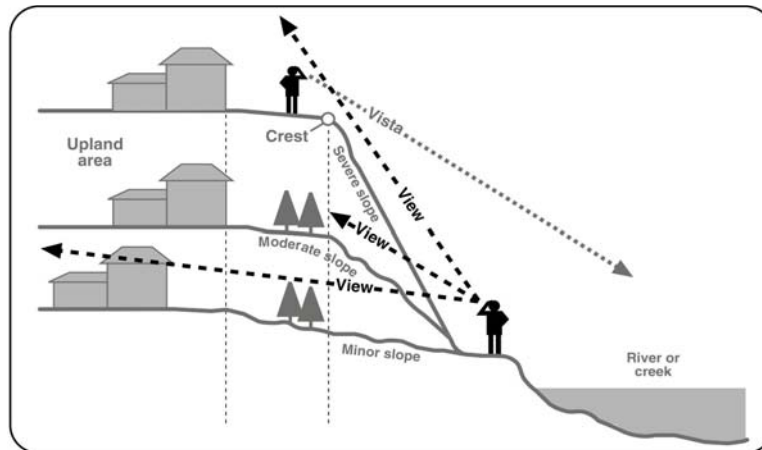


CITY POLICY

- 1.35 **Vistas and Views** means the visual appreciation of the River Valley and Ravine System taken from the Upland Area (vista) and below the Crest within the river valley or ravine (view), by an individual. See Figure 10.

Figure 10.

Vistas and Views



- 1.36 **Wayfinding** means the process of using spatial and environmental information to navigate oneself within the built or natural environment.
- 1.37 **Wildland / Urban Interface** means areas where homes and businesses are built among trees and other combustible vegetation. The largest and most significant wildland/urban interface in Edmonton is the Upland Area adjacent to the North Saskatchewan River Valley and Ravine System. Fires can move from forest, bush, or grassland areas into the community or from the community into adjacent wildlands.
- 1.38 **Wildfire Hazard Assessment System** means a structured and practical approach for assessing the hazard posed by wildfires to interface homes, facilities, or communities. This approach is outlined in the document, "FireSmart: Protecting Your Community from Wildfire".



CITY POLICY

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2. AREA OF APPLICATION

This Policy applies to Upland Areas Abutting the Crest of the North Saskatchewan River Valley and Ravine System. Most though not necessarily all of the river valley and ravine system in Edmonton is located found within the boundaries of the North Saskatchewan River Valley Area Redevelopment Plan (ARP, Schedule A) Bylaw 7188 and Section 811(Appendix I) of the City's Zoning Bylaw 12800. Notwithstanding the Area Redevelopment Plan or Zoning Bylaw boundaries, the boundary is a general boundary and is subject to more precise determination where such location is established through the approval of plans of subdivision or survey plans of the Crest. In such cases, the boundary will be amended to reflect the more precise boundary.



CITY POLICY

3. SCHEDULE A - Top of Bank Roadway Measurement February 2010



Top of Bank Roadway Measurement

February 2010
1161 10284

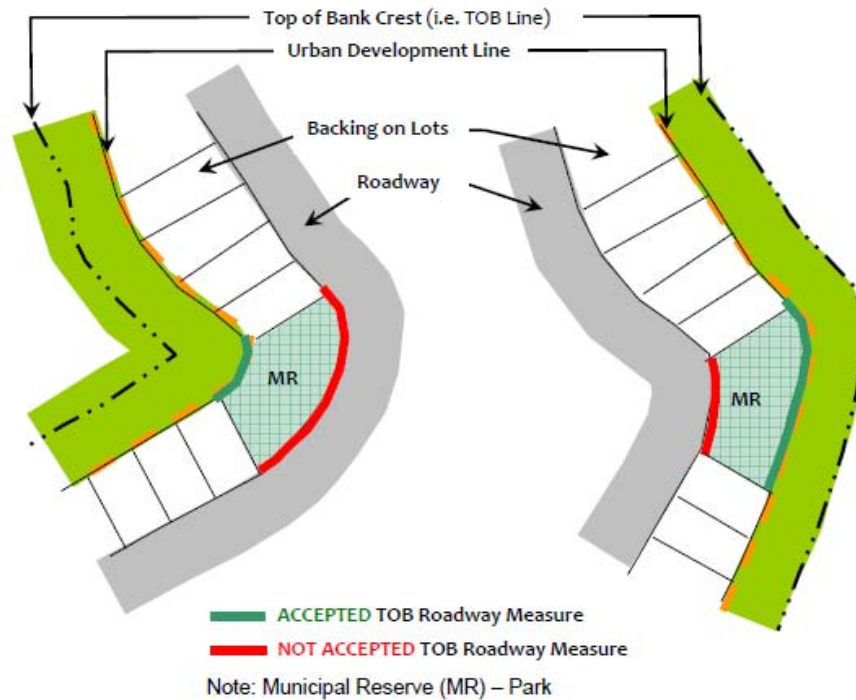


CITY POLICY

4. SCHEDULE B - Top of Bank Roadway Measurement

Schedule "B"

TOB ROADWAY MEASUREMENT



Appendix C : “Change Request Form”

CHANGE REQUEST FORM			
Requestor Information			
Company:	<input style="width: 95%;" type="text"/>	Requestor Name:	<input style="width: 95%;" type="text"/>
Date Requested:	<input style="width: 95%;" type="text"/>	Requestor Title:	<input style="width: 95%;" type="text"/>
Email Address:	<input style="width: 95%;" type="text"/>	Phone Number:	<input style="width: 95%;" type="text"/>
Change Request			
Current: (include current clause number and current text)			
Proposed: (include the clause number and text amendment)			
Reason: (Justify the need for the change. Also attach any reference material)			

City of Edmonton Parkland Developer Services Use Only	
Date Received: <input style="width: 30%;" type="text"/>	Request Number: <input style="width: 30%;" type="text"/>
Result: <input type="checkbox"/> Approved <input type="checkbox"/> Not Approved	
Reason: (for not approving or deferring)	
Date Approved: <input style="width: 30%;" type="text"/>	Director Signature: <input style="width: 30%;" type="text"/>

Appendix D : “Pesticide Notification Signage Template”



Caution

This area has been treated

With

For

Date

Time

Active Ingredient

PCP Number

AVOID PROLONGED CONTACT WITH TREATED AREA

This sign will be removed 48 hours after application date

For Further Information Call:

311



Edmonton

Appendix E : “Tree Diversity Guidelines and Approved Species Spread and Spacing”

Tree Diversity Guidelines and Approved Species Spread and Spacing

Diversity Guidelines

Species diversity must be considered during the planning and development of a neighbourhood or site. A treescape that is high in species diversity will be more tolerant of insect and disease issues and promotes a sustainable urban forest. In general, there should be no more than 25% of any one genus within the neighbourhood.

Forestry is still concerned about the high proportions of elm and ash already planted in the urban landscape. Currently, ash represents over 40% and elm represents over 35% of all roadway trees. Therefore, removal of elm and/or ash from the proposed plan may be required to increase overall diversity throughout the City.

Roadways	
Number of Required Trees within a Proposed Stage	Maximum Percentage of any one Genus
1 - 15	100%
16 - 40	75%
41 - 75	50%
75+	25%
Roadways, walkways within individual stages. Applicable to all specified trees 50mm and above.	

Parks and Open Space	
Number of Required Trees within a Proposed Stage	Maximum Percentage of any one Genus
1 - 15	75%
16 - 40	50%
41 - 75	25%
75+	20%
Applicable to all specified trees 50mm and above.	

Approved Species List – Spacing and Spread

Forestry and Parks have developed a list of acceptable tree species with recommended spacing and spread, as per the list below. Spacing may be changed at the discretion of Forestry, or by acceptance of drawings via the tender process. Agreed upon minor adjustments may be made on site. In all situations, minimum utility off-set distances must be adhered to, unless otherwise approved.

Definitions:

- S** **Street:** This species has been determined to perform well in roadway planting situations
- St** **Street Trial:** This species has the characteristics for a street tree but further observation is required
- P** **Park:** This species has been determined to perform well in a variety of open space situations
- Pt** **Parks Trial:** This species has the characteristics for an open space tree but further observation is required
- Ec** **Enhanced Conditions:** This species requires special consideration when determining its planting location or establishment requirements. Enhanced site conditions are defined as conditions that promote the health of the tree including tree trenches, increased soil volume and above base level maintenance practices.
- La** **Limited Availability:** Local suppliers have only select quantities. Use in low numbers.

Deciduous Trees			Code						
Botanical Name	Common Name	Spacing	S	St	P	Pt	Ec	La	
<i>Alnus crispa</i>	Green Alder	3 m			P				
<i>Amelanchier alnifolia</i> tree form	Saskatoon	3m			P				
<i>Acer ginnala</i>	Amur Maple (single stem)	4 m	S		P				
<i>Acer negundo</i>	Manitoba Maple	8 m	S		P				
<i>Acer saccharinum</i>	Silver Maple	10 m		St	P		Ec		
<i>Acer saccharinum</i> 'Silver Cloud'	Silver Cloud Maple	10 m		St	P		Ec		
<i>Acer saccharum</i> 'Bailsta'	Fall Fiesta Sugar Maple	10 m				Pt	Ec	La	
<i>Acer tataricum</i>	Tartarian Maple	7 m	S		P				
<i>Acer tataricum</i> 'GarAnn'	Hot Wings Maple	6 m	S		P				
<i>Acer tataricum</i> 'JFS-KW2'	Rugged Charm Maple	6 m	S		P				
<i>Acer platanoides</i>	Norway Maple	8 m		St		Pt	Ec		
<i>Acer x freemanii</i> 'Jeffersred'	Autumn Blaze Maple	8 m	S		P				
<i>Acer rubrum</i> 'Armstrong'	Armstrong Maple	5 m		St					
<i>Acer rubrum</i> 'Red Rocket'	Red Rocket Maple	4 m				Pt	Ec	La	
<i>Acer rubrum</i> 'Autumn Spire'	Autumn Spire Red Maple	5 m				Pt	Ec	La	
<i>Aesculus glabra</i>	Ohio Buckeye	5 m	S		P				
<i>Aesculus glabra</i> 'Prairie Torch'	Prairie Torch Ohio Buckeye	8 m	S		P			La	
<i>Aesculus glabra</i> 'Autumn Splendor'	Autumn Splendor Ohio Buckeye	8 m	S		P			La	
<i>Betula papyrifera</i>	Paper/ White Birch	8 m		St	P		Ec		
<i>Betula papyrifera</i> 'Varen'	Prairie Dream Birch	6 m		St	P		Ec	La	
<i>Betula platyphyll</i> 'Jefpark'	Parkland Pillar Birch	3 m				Pt	Ec		
<i>Betula papyrifera</i> 'Chickadee'	Chickadee Birch	5 m				Pt	Ec		
<i>Betula nigra</i>	River Birch	5 m				Pt	Ec		
<i>Betula platyphylla</i> 'Fargo'	Dakota Pinnacle Birch	3 m				Pt	Ec		
<i>Caragana arborescens</i> 'Sutherland'	Sutherland Caragana	3 m	S		P				
<i>Celtis occidentalis</i>	Hackberry	8 m		St		Pt	Ec		
<i>Crataegus x mordenensis</i> 'Snowbird'	Snowbird Hawthorn	5 m	S		P				
<i>Crataegus x mordenensis</i> 'Toba'	Toba Hawthorn	5 m	S		P				
<i>Elaeagnus angustifolia</i>	Russian Olive	8 m	S		P				
<i>Fraxinus americana</i>	White Ash	8 m		St	P		Ec		
<i>Fraxinus nigra</i> 'Fallgold'	Fallgold Black Ash	6 m				Pt			
<i>Fraxinus nigra x mandshurica</i> 'Northern Gem'	Northern Gem Ash	6 m				Pt			
<i>Fraxinus nigra x mandshurica</i> 'Northern Treasure'	Northern Treasure Ash	6 m				Pt			
<i>Fraxinus mandshurica</i>	Manchurian Ash	6 m		St		Pt			
<i>Fraxinus pennsylvanica</i> 'Patmore'	Patmore Ash	8 m	S		P				
<i>Fraxinus pennsylvanica</i> 'Summit'	Summit Ash	8 m	S		P			La	
<i>Fraxinus pennsylvanica</i>	Foothills Ash	8 m	S		P				

Deciduous Trees			Code					
<i>Fraxinus pennsylvanica</i> 'Bergeson'	Bergeson Ash	8 m	S		P			La
<i>Fraxinus pennsylvanica</i> 'Prairie Spire'	Prairie Spire Ash	8 m	S		P			
<i>Fraxinus pennsylvanica</i> (seedless variety)	Green Ash	8 m	S		P			
<i>Gleditsia triacanthos</i> var. <i>inermis</i> 'Dursan'	Prairie Silk Honeylocust	8 m		St	P		Ec	La
<i>Gleditsia triacanthos</i> var. <i>inermis</i> 'Shademaster'	Shademaster Honeylocust	8 m		St	P		Ec	La
<i>Gleditsia triacanthos</i> var. <i>inermis</i> 'Harve'	Northern Acclaim Honeylocust	8 m		St	P		Ec	La
<i>Juglans nigra</i>	Black Walnut	10 m			P			La
<i>Juglans cinerea</i>	Butternut	10 m			P			La
<i>Maackia amurensis</i>	Amur Maackia	8 m		St	P			
<i>Malus x baccata</i> 'Dolgo'	Dolgo Crabapple	5 m			P			
<i>Malus baccata</i>	Siberian Crabapple	5 m	S		P			
<i>Malus x</i> 'Spring Snow'	Spring Snow Crabapple	5 m	S		P			
<i>Malus x adstringens</i> 'Thunderchild'	Thunderchild Crabapple	5 m	S		P			
<i>Malus x adstringens</i> 'Durleo'	Gladiator Crabapple	3 m	S		P			
<i>Malus x adstringens</i> 'Royalty'	Royalty Crabapple	5 m			P			
<i>Malus x baccata</i> 'Columnaris'	Rosthern Crabapple	3 m	S		P			
<i>Malus x adstringens</i> 'Makamic'	Makamic Crabapple	5 m			P			
<i>Malus x adstringens</i> 'Kelsey'	Kelsey Crabapple	5 m			P			
<i>Malus x</i> 'Jeflite'	Starlite Crabapple	5 m		St	P			
<i>Malus x</i> 'DurBy'	Ambassador Crabapple	4 m			P			
<i>Malus x</i> 'Big River'	Big River Crabapple	5 m			P			
<i>Malus x</i> 'Durlawrence'	Courageous Crabapple	5 m			P			
<i>Malus x prunifolia</i> var 'Rinki Crabapple'	Rinki Crabapple	5 m	S		P			
<i>Malus x</i> 'Jefgreen'	Emerald Spire Crabapple	2 m	S		P			
<i>Malus x</i> 'Jefspire'	Purple Spire Crabapple	2 m	S		P			
<i>Phellodendron amurense</i>	Amur Cork Tree	10 m			P			
<i>Populus x</i> 'Assiniboine'	Assiniboine Poplar	8 m			P			
<i>Populus x</i> 'ACWS151'	Sundancer Poplar	4 m			P			
<i>Populus x</i> 'Tristis'	Tristis Poplar	10 m			P			
<i>Populus x</i> 'Okanese'	Okanese Poplar	8 m			P			
<i>Populus tremula</i> 'Erecta'	Swedish Columnar Aspen	2 m	S		P			
<i>Populus tremuloides</i>	Trembling Aspen	5 m	S		P			
<i>Populus balsamifera</i>	Balsam Poplar	10 m			P			
<i>Populus x jaackii</i> 'Northwest'	Northwest Poplar	10 m			P			
<i>Prunus nigra</i> 'Princess Kay'	Flowering Plum	6 m			P			
<i>Prunus maackii</i>	Amur Cherry	8 m	S		P			
<i>Prunus maackii</i> 'Jefree'	Goldrush Amur Cherry	6 m	S					
<i>Prunus maackii</i> 'Jefspur'	Gold Spur Amur Cherry	3 m	S					

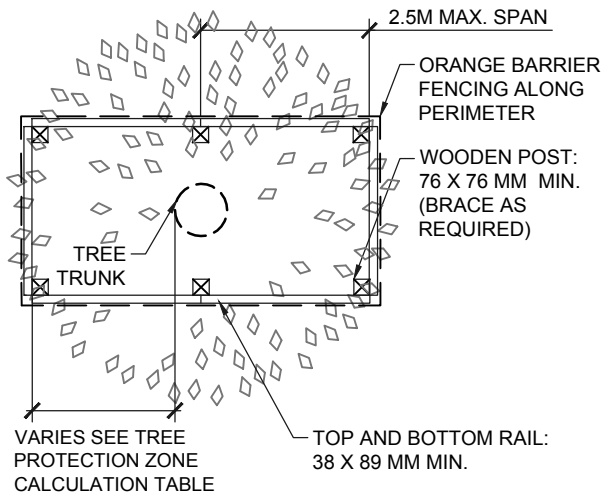
Deciduous Trees			Code					
<i>Prunus padus</i> var. <i>commutata</i>	Mayday Tree	8 m	S		P			
<i>Prunus pensylvanica</i>	Pin Cherry	6 m			P			
<i>Prunus virginiana</i> 'Schubert'	Schubert Chokecherry	8 m	S		P			
<i>Prunus virginiana</i> 'Spur'	Spur Schubert Chokecherry	8 m	S		P			
<i>Pyrus fauriei</i> 'Westwood'*	Korean Sun Ornamental Pear	6 m				Pt	Ec	La
<i>Pyrus ussuriensis</i> 'MorDak'*	Prairie Gem Ornamental Pear	6 m				Pt	Ec	La
<i>Pyrus ussuriensis</i> 'Mountain Frost'*	Mountain Frost Ornamental Pear	6 m				Pt	Ec	La
<i>Pyrus</i> x DurPSN303 '	Navigator Pear	5 m				Pt	Ec	La
<i>Quercus macrocarpa</i>	Bur Oak	8 m	S		P			
<i>Quercus palustris</i>	Pin Oak	8 m		St		Pt	Ec	
<i>Quercus rubra</i>	Red Oak	8 m		St		Pt	Ec	
<i>Quercus ellipsoidalis</i>	Northern Pin Oak	8 m		St		Pt	Ec	
<i>Quercus borealis</i>	Northern Red Oak	8 m		St		Pt	Ec	
<i>Quercus macrocarpa</i> 'JFS-KW14'	Cobblestone Oak	8 m		St		Pt	Ec	La
<i>Quercus macrocarpa</i> 'Top Gun'	Top Gun Bur Oak	5 m		St		Pt	Ec	La
<i>Quercus</i> x <i>warei</i> 'Long'	Regal Prince Oak	6 m		St		Pt	Ec	La
<i>Salix alba</i> 'Vitellina'	Golden Willow	10 m			P			
<i>Salix pentandra</i>	Laurel Leaf Willow	10 m			P			
<i>Salix acutifolia</i>	Sharp Leaf Willow	10 m			P			
<i>Sorbus americana</i>	American Mtn. Ash	6 m	S		P			
<i>Sorbus aucuparia</i> 'Rossica'	Russian Mountain Ash	4 m	S		P			
<i>Sorbus aucuparia</i> 'Fastigiata'	Pyramidal Mtn. Ash	4 m	S		P			
<i>Sorbus aucuparia</i> 'Skybound'	Skybound Mountain Ash	5 m	S		P			
<i>Sorbus decora</i>	Showy Mountain Ash	5 m	S		P			
<i>Sorbus hybrida</i>	Oak Leaf Mountain Ash	5 m	S		P			
<i>Syringa reticulata</i> 'Ivory Silk'	Ivory Silk / Japanese Tree Lilac	5 m	S		P			
<i>Tilia americana</i>	American Linden	8 m	S		P			
<i>Tilia americana</i> 'Duros'	True North Linden	8 m	S		P			La
<i>Tilia americana</i> 'Redmond'	Redmond Linden	8 m	S		P			La
<i>Tilia cordata</i>	Littleleaf Linden	8 m	S		P			
<i>Tilia cordata</i> 'Greenspire'	Greenspire Littleleaf Linden	8 m	S		P			La
<i>Tilia cordata</i> 'Corzam'	Corinthian Linden	8 m	S		P			La
<i>Tilia</i> x <i>flavescens</i> 'Dropmore'	Dropmore Linden	8 m	S		P			
<i>Ulmus americana</i>	American Elm	10 m	S		P			
<i>Ulmus americana</i> 'Brandon'	Brandon Elm	8 m	S		P			
<i>Ulmus americana</i> 'Patmore'	Patmore Elm	8 m	S		P			La
<i>Ulmus pumila</i>	Siberian Elm	10 m	S		P			

Coniferous Trees			Code						
Botanical Name	Common Name	Spacing	S	St	P	Pt	Ec	La	
<i>Abies balsamea</i>	Balsam Fir	6 m				Pt		La	
<i>Abies concolor</i>	White Fir	6 m				Pt		La	
<i>Juniperus scopulorum</i> 'Wichita Blue'	Wichita Blue Upright Juniper	4 m				Pt		La	
<i>Juniperus scopulorum</i> 'Moonglow'	Moonglow Upright Juniper	4 m				Pt		La	
<i>Juniperus scopulorum</i> 'Medora'	Medora Upright Juniper	4 m				Pt		La	
<i>Juniperus virginiana</i> 'Blue Arrow'	Blue Arrow Upright Juniper	4 m				Pt		La	
<i>Juniperus virginiana</i> 'Skyrocket'	Skyrocket Upright Juniper	4 m				Pt		La	
<i>Larix sibirica</i>	Siberian Larch	8 m			P				
<i>Larix laricina</i>	Tamarack	8 m			P				
<i>Picea abies</i>	Norway Spruce	8 m			P				
<i>Picea engelmannii</i>	Engleman Spruce	8 m			P				
<i>Picea glauca</i>	White Spruce	8 m			P				
<i>Picea glauca</i> var. <i>densata</i>	Black Hills Spruce	8 m			P				
<i>Picea mariana</i>	Black Spruce	8 m			P		Ec		
<i>Picea omorika</i> 'Bruns'	Bruns Serbian Spruce	8 m			P		Ec	La	
<i>Picea pungens</i> 'Fastigiata'	Columnar Colorado Spruce	3 m			P				
<i>Picea pungens</i>	Colorado Green Spruce	8 m			P				
<i>Picea pungens</i> var. <i>glauca</i>	Colorado Blue Spruce	8 m			P				
<i>Pinus aristata</i>	Bristlecone Pine	4 m				Pt		La	
<i>Pinus banksiana</i>	Jack Pine	4 m			P				
<i>Pinus cembra</i>	Swiss Stone Pine	4 m			P			La	
<i>Pinus contorta</i> var. <i>latifolia</i>	Lodgepole Pine	4 m			P				
<i>Pinus flexilis</i>	Limber Pine	4 m				Pt			
<i>Pinus mugo</i> subspecies <i>uncinata</i>	Mountain Pine	8 m				Pt			
<i>Pinus nigra</i>	Austrian Pine	8 m			P			La	
<i>Pinus ponderosa</i>	Ponderosa Pine	10 m			P				
<i>Pinus strobus</i>	Eastern White Pine	8 m			P			La	
<i>Pinus strobus fastigiata</i>	Columnar Eastern White Pine	4 m			P			La	
<i>Pinus sylvestris</i>	Scots Pine	8 m			P				
<i>Pseudotsuga menziesii</i>	Douglas Fir	8 m			P				
<i>Thuja</i> 'Brandon'	Brandon Pyramidal Cedar	4 m			P				
<i>Thuja</i> 'Skybound'	Skybound Pyramidal Cedar	4 m			P				
<i>Thuja</i> 'Degroots Spire'	Degroots Spire Pyramidal Cedar	4 m			P				

Landscape Construction Detail Reference

Drawing No.	Drawing Title	Issue Date
LA101	Tree Protection Zone	June 2017
LA102	Typical Tree Installation	March 2021
LA103	Typical Multi-Stem Installation	March 2021
LA104	Typical Tree Transplanted	March 2021
LA105	Typical Multi-Stem Transplanted	March 2021
LA106	Typical Tree Grate Planting	March 2021
LA107	Typical Tree Planting on Slope	March 2021
LA108	Typical Tree Planting Bed	March 2021
LA108A	Typical Tree and Shrub Planting Bed	March 2021
LA108B	Typical Shrub Planting	March 2021
LA109	Typical Planting Bed on a Slope	March 2021
LA110A	Typical Shrub Restoration	March 2021
LA110B	Typical Shrub Naturalization	March 2021
LA111	Typical Tree Naturalization	March 2021
LA112	Typical Tree Rodent Protection	March 2021
LA113	Typical Tree Root Trench	March 2021
LA114	Typical Tree Rootball Staking	March 2021
LA200	Subdrainage Pipe Installation	March 2021
LA201	Typical Subdrainage Pipe Connections	June 2017
LA202	Playground Drainage Sump	March 2021
LA203	Concrete Playground Curb Adjacent Wood Mulch & Pour-In-Place	September 2013
LA204	Typical Pour-In-Place Playground Safety Surface	September 2013
LA204A	Typical Pour-In-Place Playground Safety Surface - All Rubber	September 2013
LA300	Sod Installation	March 2021
LA301	Asphalt Walkway or Plaza	March 2021
LA302	Concrete Walkway or Plaza	March 2021
LA303	Granular Walkway	March 2021
LA304	Paving Stone Walkway or Plaza	September 2013
LA305	Gravel Plank Steps	September 2013
LA306	Gravel Timber Steps	September 2013
LA400	Permanent Wood Rail Fence	June 2015
LA401	Temporary Wood Rail Fence	June 2015
LA402	915mm High Wood Guard Rail	June 2015
LA403	1400mm High Wood Guard Rail	June 2015
LA404	152 x 203mm Wood Bumper Post	September 2013
LA405	1800mm Height Wood Screen Fence	June 2017
LA405A	1800mm Wood Screen Fence Gate - Single	June 2015

LA405B	1800mm Wood Screen Fence Gate - Double	June 2015
LA406	Wood Screen Step Down	September 2013
LA407	Chain Link Fence	June 2015
LA407A	Barbed Wire for Chain Link Fence	June 2015
LA408	Chain Link Fence Single Gate	June 2015
LA408A	Barbed Wire for Chain Link Fence Single Gate	June 2015
LA409	Chain Link Fence Double Gate	June 2015
LA409A	Barbed Wire for Chain Link Fence Double Gate	June 2015
LA500	Bench - Wood and Concrete	September 2013
LA501	Picnic Table - Wood and Concrete	September 2013
LA502	Bench Installation	September 2013
LA503	Picnic Table - Installation	September 2013
LA504	Concrete Litter Container and Installation	September 2013
LA505	Community Garden Planter	June 2015
LA600	Boulder Installation	September 2013
LA601	Culvert Under Walkway	September 2013
LA602	Wood Bridge With Recycled Plastic Product Deck	September 2013

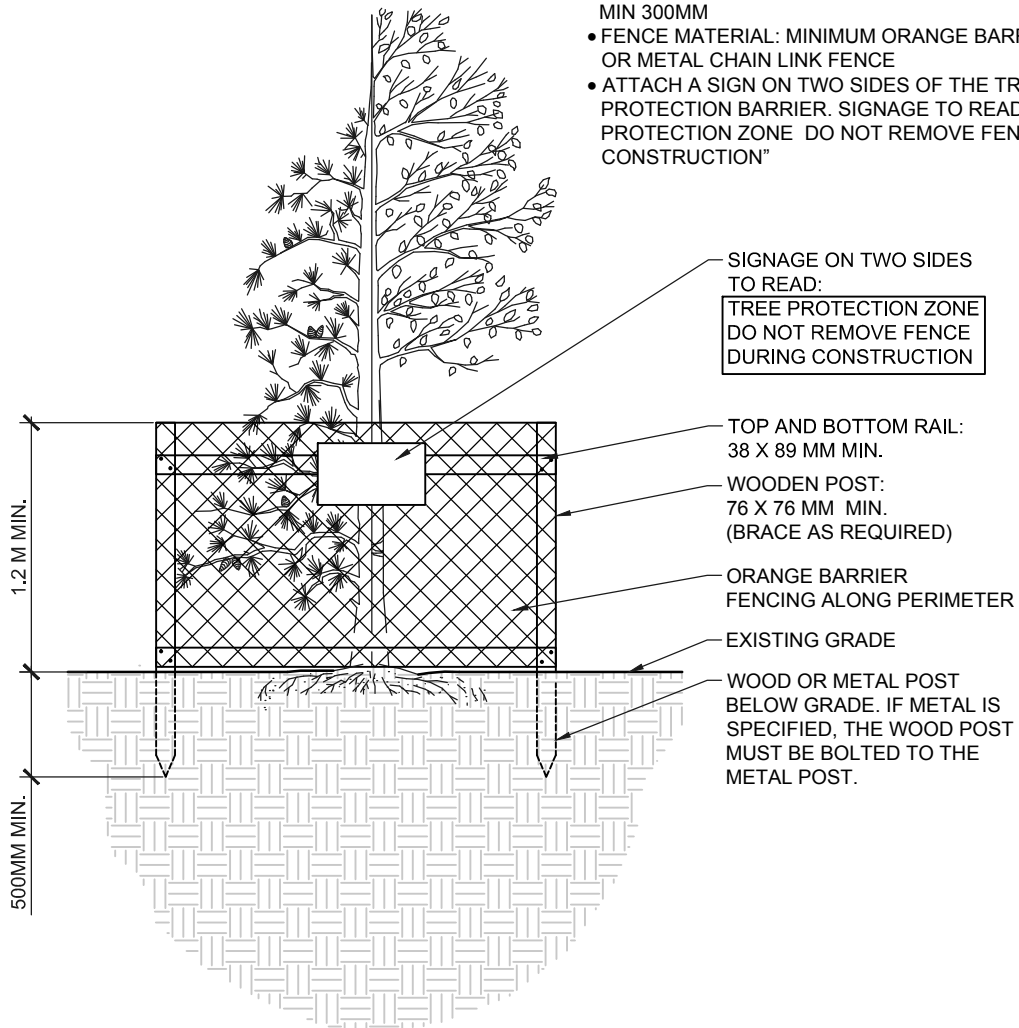


PLAN VIEW

TREE PROTECTION ZONE CALCULATION TABLE	
TRUNK DIAMETER (DBH)	MINIMUM PROTECTION DISTANCE REQUIRED (MEASURE FROM THE OUTSIDE EDGE OF TREE TRUNK)
10 CM & UNDER	1.2 METERS
11 - 30 CM	1.8 METERS
31 - 40 CM	2.4 METERS
41 - 50 CM	3.0 METERS
51 - 60 CM	3.6 METERS
61 - 70 CM	4.2 METERS
71 - 80 CM	4.8 METERS
>80 CM	5.0 METERS

NOTES:

- WOOD POST: (MIN. 76MM WIDTH) INSTALLED TO A DEPTH OF 500MM (ALBERTA FIRST CALL REQUIRED)
- TOP AND BOTTOM RAIL: (MIN. 38 X 89MM CONSTRUCTION, MAX. SPAN 2.5M), CROSS BRACING AS REQUIRED.
- HEIGHT OF THE FENCE: MIN. 1.2 METERS
- NO GROUND DISTURBANCE WITHIN 1.2 METER OF THE TREE TRUNK (I.E. POST INSTALLATION)
- POSTS SET BACK FROM SIDEWALK AND CURB: MIN 300MM
- FENCE MATERIAL: MINIMUM ORANGE BARRIER FENCE OR METAL CHAIN LINK FENCE
- ATTACH A SIGN ON TWO SIDES OF THE TREE PROTECTION BARRIER. SIGNAGE TO READ "TREE PROTECTION ZONE DO NOT REMOVE FENCE DURING CONSTRUCTION"

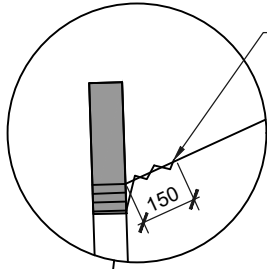


TREE PROTECTION ZONE

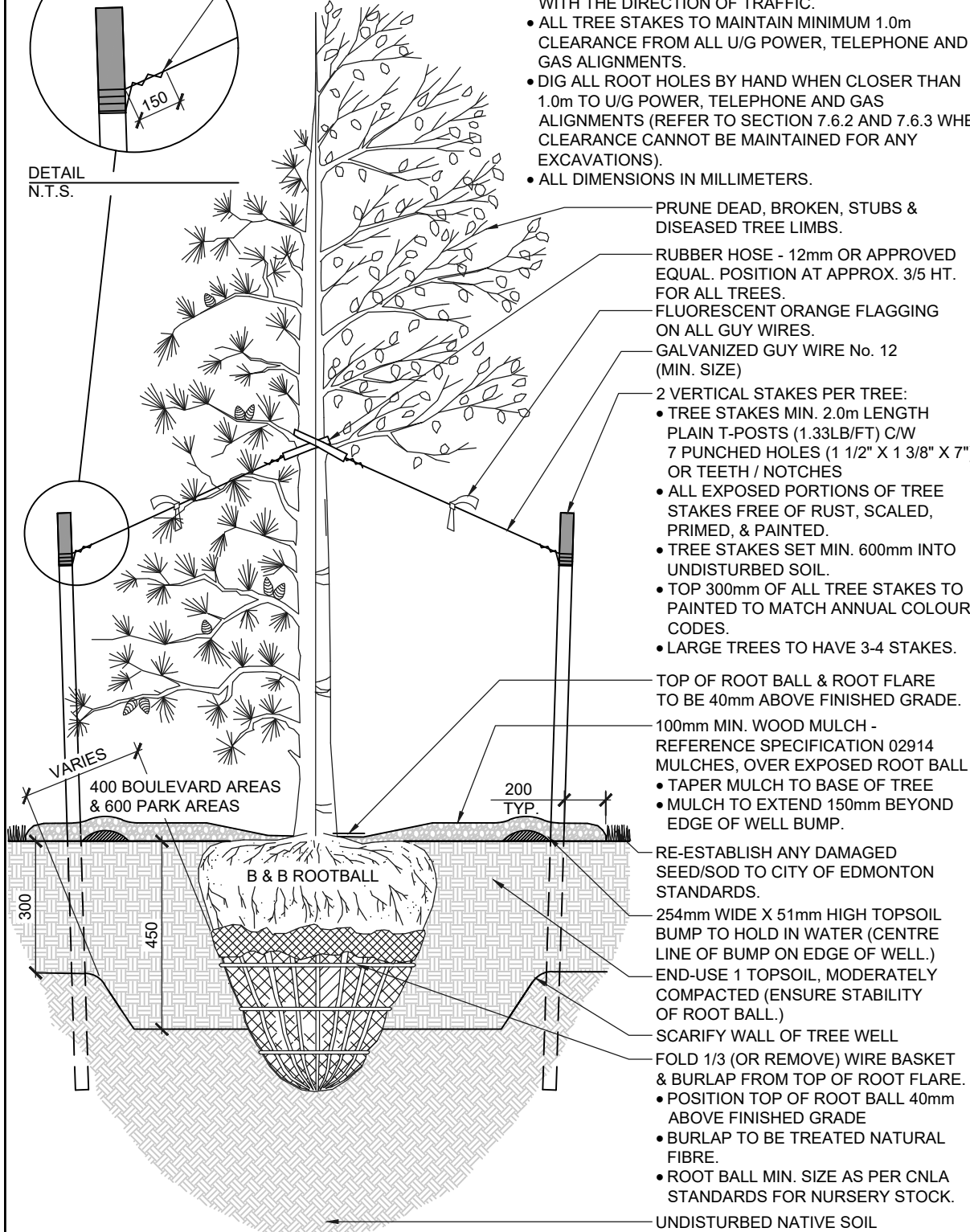
Date Approved: JUNE 2017	Drawn By: PARKS PLANNING	Approved: 	Revision	Drawing No. LA101
Scale: N.T.S.	Checked By: PARKS PLANNING			Old Drawing No. SP403a

CONIFEROUS
Less than 3.0m ht.

DECIDUOUS
Less than 100mm cal.



DETAIL
N.T.S.



NOTES:

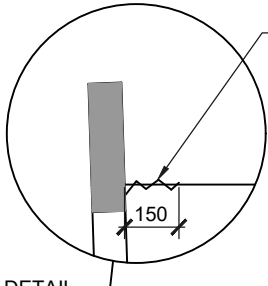
- ALL COMPONENTS AND WORKMANSHIP TO CONFORM TO SPECIFICATION SECTION 02930 TREES, SHRUBS AND GROUNDCOVERS AS WELL AS THE RELATED SECTIONS.
- IF MINIMUM UTILITY SETBACKS PERMIT POSITION TREE STAKES INTO DIRECTION OF PREVAILING WINDS OR IF IN THE BOULEVARD THE STAKES SHOULD BE IN LINE WITH THE DIRECTION OF TRAFFIC.
- ALL TREE STAKES TO MAINTAIN MINIMUM 1.0m CLEARANCE FROM ALL U/G POWER, TELEPHONE AND GAS ALIGNMENTS.
- DIG ALL ROOT HOLES BY HAND WHEN CLOSER THAN 1.0m TO U/G POWER, TELEPHONE AND GAS ALIGNMENTS (REFER TO SECTION 7.6.2 AND 7.6.3 WHEN CLEARANCE CANNOT BE MAINTAINED FOR ANY EXCAVATIONS).
- ALL DIMENSIONS IN MILLIMETERS.

- PRUNE DEAD, BROKEN, STUBS & DISEASED TREE LIMBS.
- RUBBER HOSE - 12mm OR APPROVED EQUAL. POSITION AT APPROX. 3/5 HT. FOR ALL TREES.
- FLUORESCENT ORANGE FLAGGING ON ALL GUY WIRES.
- GALVANIZED GUY WIRE No. 12 (MIN. SIZE)
- 2 VERTICAL STAKES PER TREE:
 - TREE STAKES MIN. 2.0m LENGTH PLAIN T-POSTS (1.33LB/FT) C/W 7 PUNCHED HOLES (1 1/2" X 1 3/8" X 7") OR TEETH / NOTCHES
 - ALL EXPOSED PORTIONS OF TREE STAKES FREE OF RUST, SCALED, PRIMED, & PAINTED.
 - TREE STAKES SET MIN. 600mm INTO UNDISTURBED SOIL.
 - TOP 300mm OF ALL TREE STAKES TO PAINTED TO MATCH ANNUAL COLOUR CODES.
 - LARGE TREES TO HAVE 3-4 STAKES.
- TOP OF ROOT BALL & ROOT FLARE TO BE 40mm ABOVE FINISHED GRADE.
- 100mm MIN. WOOD MULCH - REFERENCE SPECIFICATION 02914 MULCHES, OVER EXPOSED ROOT BALL
 - TAPER MULCH TO BASE OF TREE
 - MULCH TO EXTEND 150mm BEYOND EDGE OF WELL BUMP.
- RE-ESTABLISH ANY DAMAGED SEED/SOD TO CITY OF EDMONTON STANDARDS.
- 254mm WIDE X 51mm HIGH TOPSOIL BUMP TO HOLD IN WATER (CENTRE LINE OF BUMP ON EDGE OF WELL.)
- END-USE 1 TOPSOIL, MODERATELY COMPACTED (ENSURE STABILITY OF ROOT BALL.)
- SCARIFY WALL OF TREE WELL
- FOLD 1/3 (OR REMOVE) WIRE BASKET & BURLAP FROM TOP OF ROOT FLARE.
 - POSITION TOP OF ROOT BALL 40mm ABOVE FINISHED GRADE
 - BURLAP TO BE TREATED NATURAL FIBRE.
 - ROOT BALL MIN. SIZE AS PER CNLA STANDARDS FOR NURSERY STOCK.
- UNDISTURBED NATIVE SOIL



TYPICAL TREE INSTALLATION

Date Approved: FEB 2021	Drawn By: DEDR	Approved:	Revision	Drawing No. LA102
Scale: N.T.S.	Checked by: OPEN SPACE DESIGN			Old Drawing No. SP400a

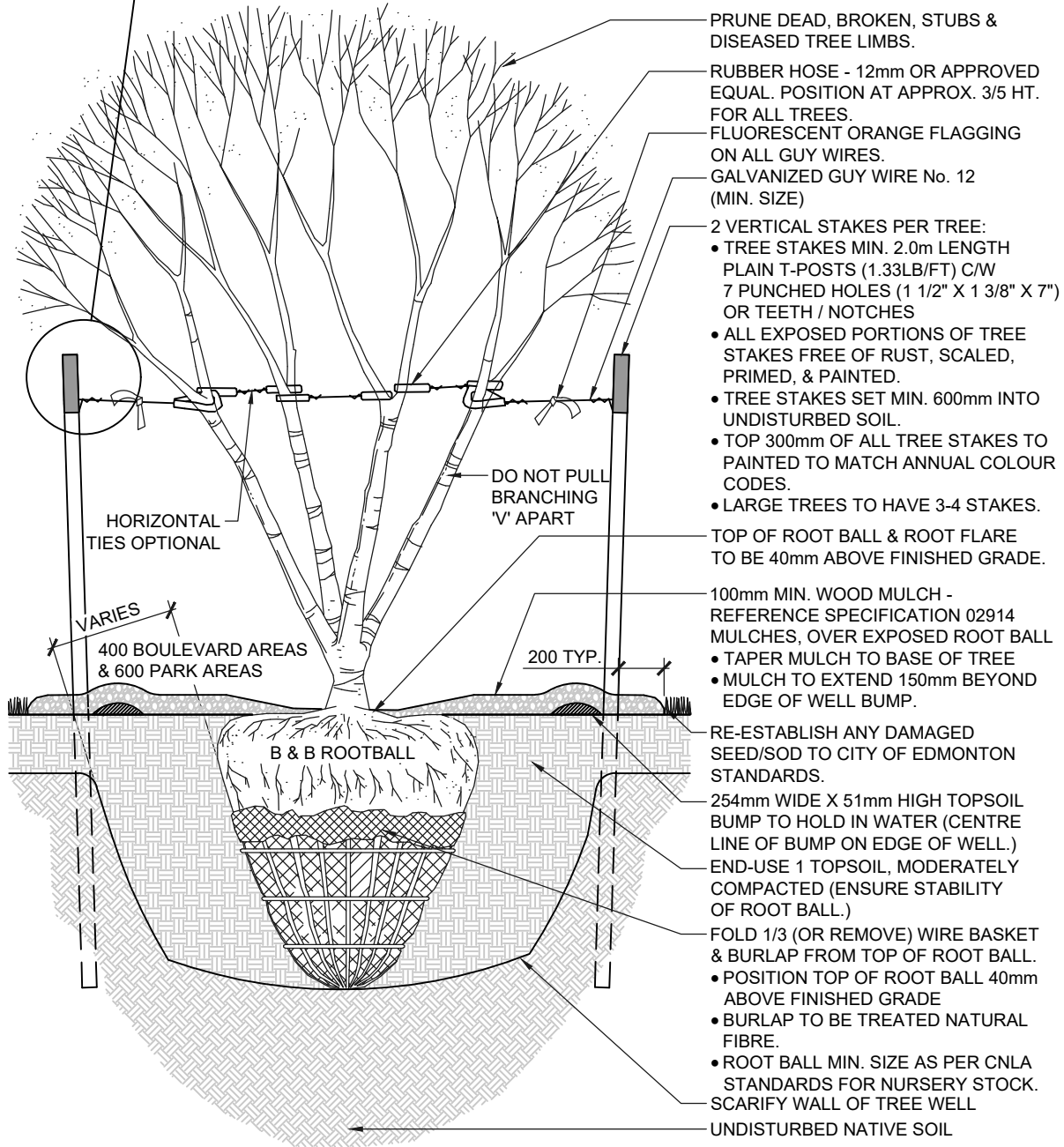


WRAP GUY WIRE END
BACK ON ITS SELF

DETAIL
N.T.S.

NOTES:

- ALL COMPONENTS AND WORKMANSHIP TO CONFORM TO SPECIFICATION SECTION 02930 TREES, SHRUBS AND GROUNDCOVERS AS WELL AS THE RELATED SECTIONS.
- IF MINIMUM UTILITY SETBACKS PERMIT POSITION TREE STAKES INTO DIRECTION OF PREVAILING WINDS OR IF IN THE BOULEVARD THE STAKES SHOULD BE IN LINE WITH THE DIRECTION OF TRAFFIC.
- ALL TREE STAKES TO MAINTAIN MINIMUM 1.0m CLEARANCE FROM ALL U/G POWER, TELEPHONE AND GAS ALIGNMENTS.
- DIG ALL ROOT HOLES BY HAND WHEN CLOSER THAN 1.0m TO U/G POWER, TELEPHONE AND GAS ALIGNMENTS (REFER TO SECTION 7.6.2 AND 7.6.3 WHEN CLEARANCE CANNOT BE MAINTAINED FOR ANY EXCAVATIONS).
- ALL DIMENSIONS IN MILLIMETERS.

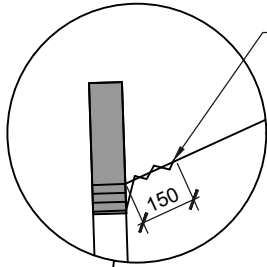


TYPICAL MULTI-STEM INSTALLATION

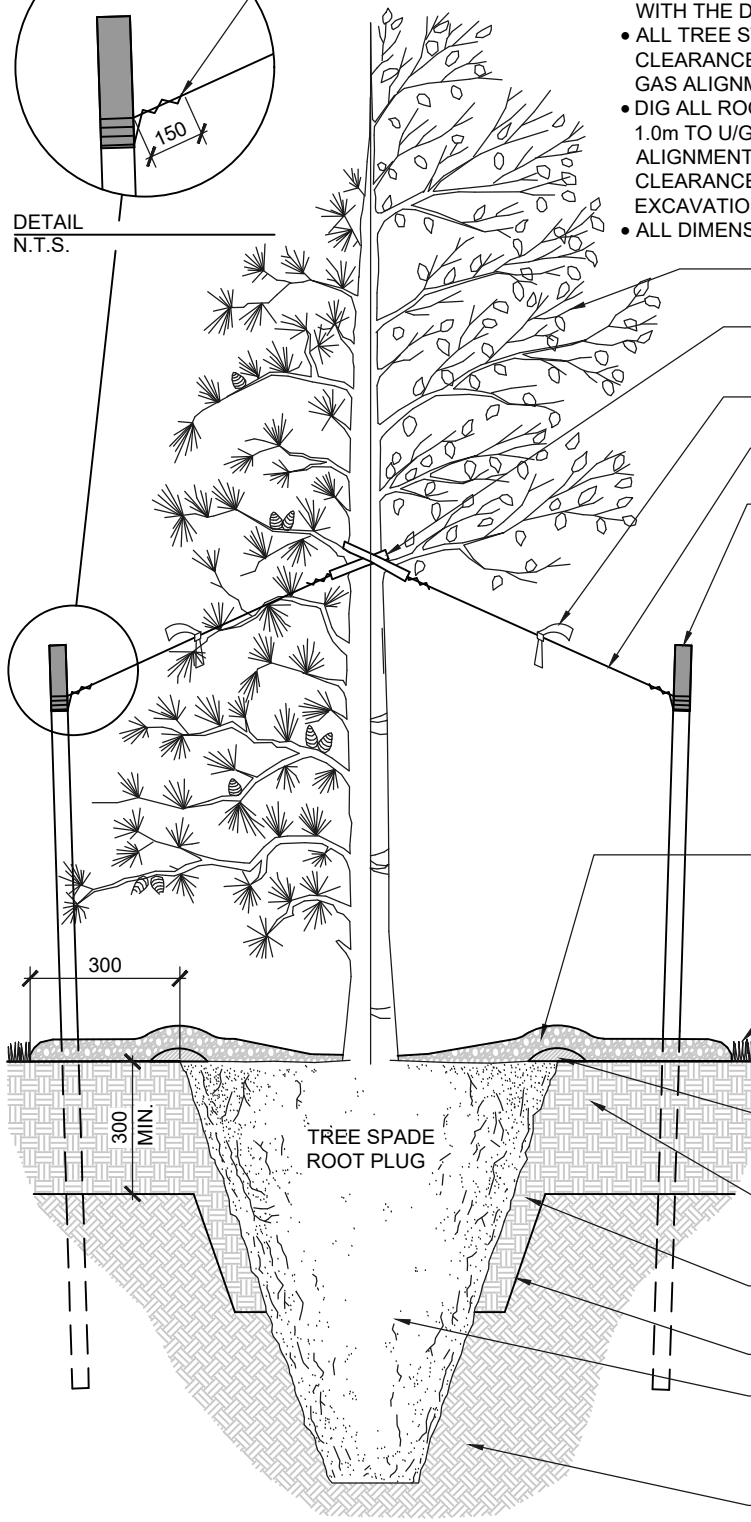
Date Approved: FEB 2021	Drawn By: DEDR	Approved:	Revision	Drawing No. LA103
Scale: N.T.S.	Checked By: OPEN SPACE DESIGN			Old Drawing No. SP400c

CONIFEROUS
Less than 3.0m ht.

DECIDUOUS
Less than 200mm cal.



DETAIL
N.T.S.



NOTES:

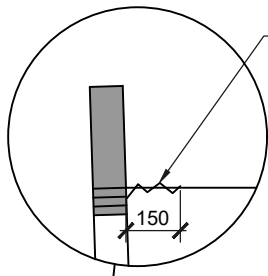
- ALL COMPONENTS AND WORKMANSHIP TO CONFORM TO SPECIFICATION SECTION 02930 TREES, SHRUBS AND GROUNDCOVERS AS WELL AS THE RELATED SECTIONS.
- IF MINIMUM UTILITY SETBACKS PERMIT POSITION TREE STAKES INTO DIRECTION OF PREVAILING WINDS OR IF IN THE BOULEVARD THE STAKES SHOULD BE IN LINE WITH THE DIRECTION OF TRAFFIC.
- ALL TREE STAKES TO MAINTAIN MINIMUM 1.0m CLEARANCE FROM ALL U/G POWER, TELEPHONE AND GAS ALIGNMENTS.
- DIG ALL ROOT HOLES BY HAND WHEN CLOSER THAN 1.0m TO U/G POWER, TELEPHONE AND GAS ALIGNMENTS (REFER TO SECTION 7.6.2 AND 7.6.3 WHEN CLEARANCE CANNOT BE MAINTAINED FOR ANY EXCAVATIONS).
- ALL DIMENSIONS IN MILLIMETERS.

- PRUNE DEAD, BROKEN, STUBS & DISEASED TREE LIMBS.
- RUBBER HOSE - 12mm OR APPROVED EQUAL. POSITION AT APPROX. 3/5 HT. FOR ALL TREES.
- FLUORESCENT ORANGE FLAGGING ON ALL GUY WIRES.
- GALVANIZED GUY WIRE No. 12 (MIN. SIZE)
- 2 VERTICAL STAKES PER TREE:
 - TREE STAKES MIN. 2.0m LENGTH PLAIN T-POSTS (1.33LB/FT) C/W 7 PUNCHED HOLES (1 1/2" X 1 3/8" X 7") OR TEETH / NOTCHES.
 - ALL EXPOSED PORTIONS OF TREE STAKES FREE OF RUST, SCALED, PRIMED, & PAINTED.
 - TREE STAKES SET MIN. 600mm INTO UNDISTURBED SOIL.
 - TOP 300mm OF ALL TREE STAKES TO PAINTED TO MATCH ANNUAL COLOUR CODES.
 - LARGE TREES TO HAVE 3-4 STAKES.
- 100mm MIN. WOOD MULCH - REFERENCE SPECIFICATION 02914 MULCHES, OVER EXPOSED ROOT BALL
 - TAPER MULCH TO BASE OF TREE
 - MULCH TO EXTEND 150mm BEYOND EDGE OF WELL BUMP.
- RE-ESTABLISH ANY DAMAGED SEED/SOD TO CITY OF EDMONTON STANDARDS.
- 254mm WIDE X 51mm HIGH TOPSOIL BUMP TO HOLD IN WATER (CENTRE LINE OF BUMP ON EDGE OF WELL.)
- END-USE 1 TOPSOIL, MODERATELY COMPACTED (ENSURE STABILITY OF ROOT BALL.)
- ENSURE ANY VOIDS ARE FILLED WITH TOPSOIL
- SCARIFY WALL OF TREE WELL
- ROOT PLUG (MINIMUM SIZE AS PER SPECIFICATIONS) - FOR EVERY 25mm OF D.B.H. OVER MIN. SIZE ADD 300mm TO SPADE WIDTH
- UNDISTURBED NATIVE SOIL



TYPICAL TREE TRANSPLANTED

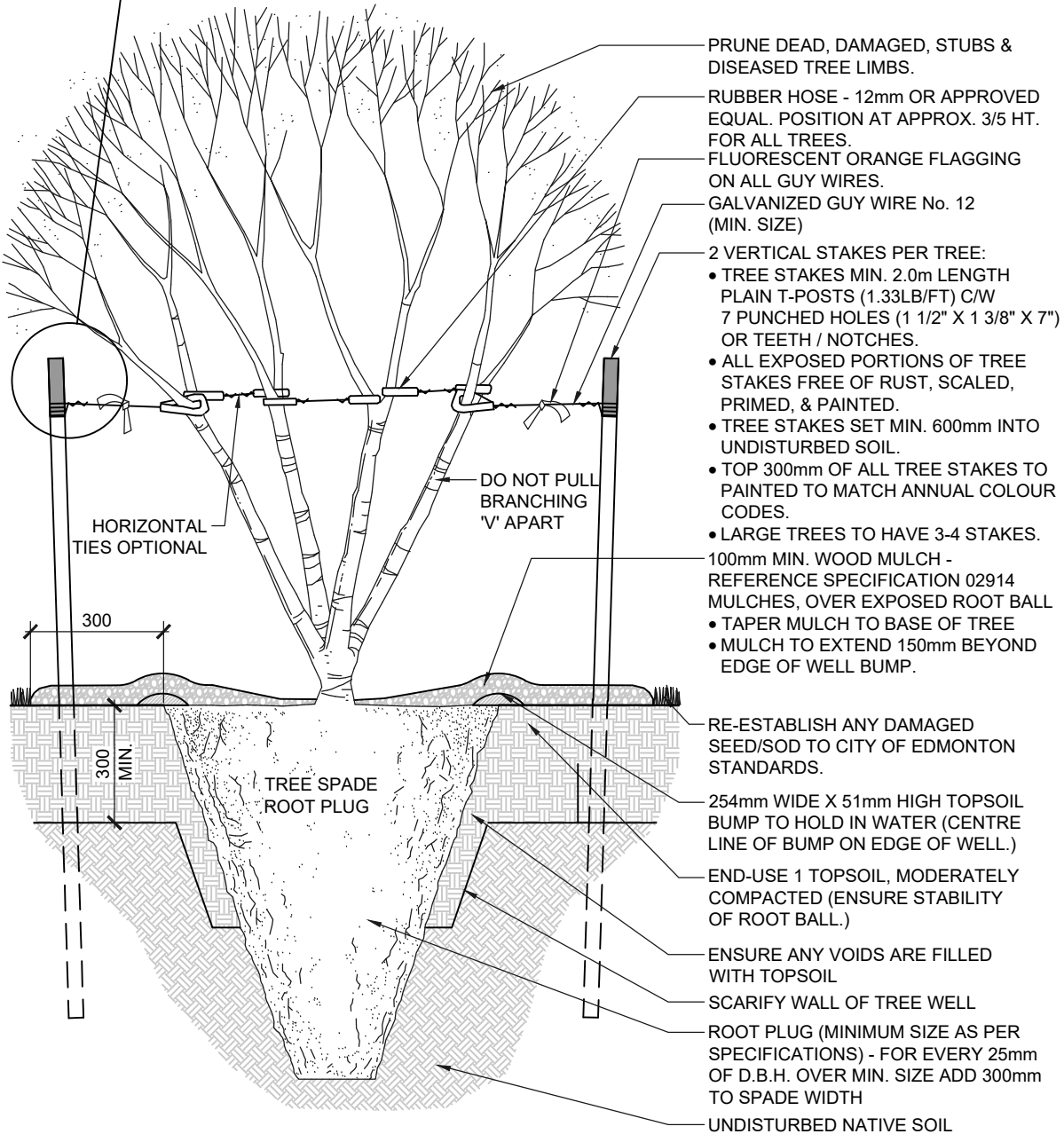
Date Approved: FEB 2021	Drawn By: DEDR	Approved:	Revision	Drawing No. LA104
Scale: N.T.S.	Checked By: OPEN SPACE DESIGN			Old Drawing No. SP400d



WRAP GUY WIRE END BACK ON ITS SELF

DETAIL
N.T.S.

- NOTES:**
- ALL COMPONENTS AND WORKMANSHIP TO CONFORM TO SPECIFICATION SECTION 02930 TREES, SHRUBS AND GROUNDCOVERS AS WELL AS THE RELATED SECTIONS.
 - IF MINIMUM UTILITY SETBACKS PERMIT POSITION TREE STAKES INTO DIRECTION OF PREVAILING WINDS OR IF IN THE BOULEVARD THE STAKES SHOULD BE IN LINE WITH THE DIRECTION OF TRAFFIC.
 - ALL TREE STAKES TO MAINTAIN MINIMUM 1.0m CLEARANCE FROM ALL U/G POWER, TELEPHONE AND GAS ALIGNMENTS.
 - DIG ALL ROOT HOLES BY HAND WHEN CLOSER THAN 1.0m TO U/G POWER, TELEPHONE AND GAS ALIGNMENTS (REFER TO SECTION 7.6.2 AND 7.6.3 WHEN CLEARANCE CANNOT BE MAINTAINED FOR ANY EXCAVATIONS).
 - ALL DIMENSIONS IN MILLIMETERS.



TYPICAL MULTI-STEM TRANSPLANTED

Date Approved: FEB 2021	Drawn By: DEDR	Approved: 	Revision	Drawing No. LA105
Scale: N.T.S.	Checked By: OPEN SPACE DESIGN			Old Drawing No. SP400f

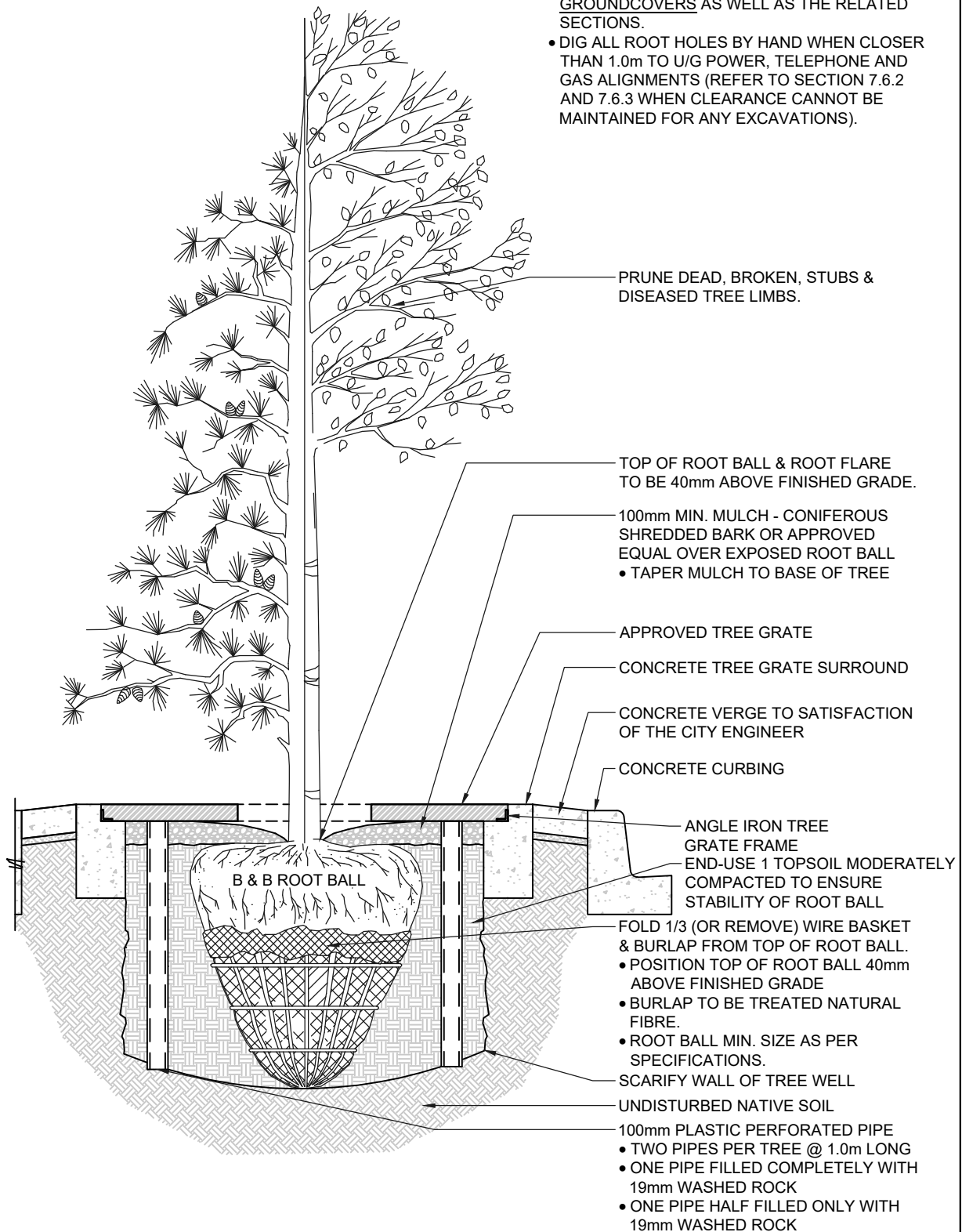
CONIFEROUS
Less than 3.0m ht.

DECIDUOUS
Less than 100mm cal.

NOTES:

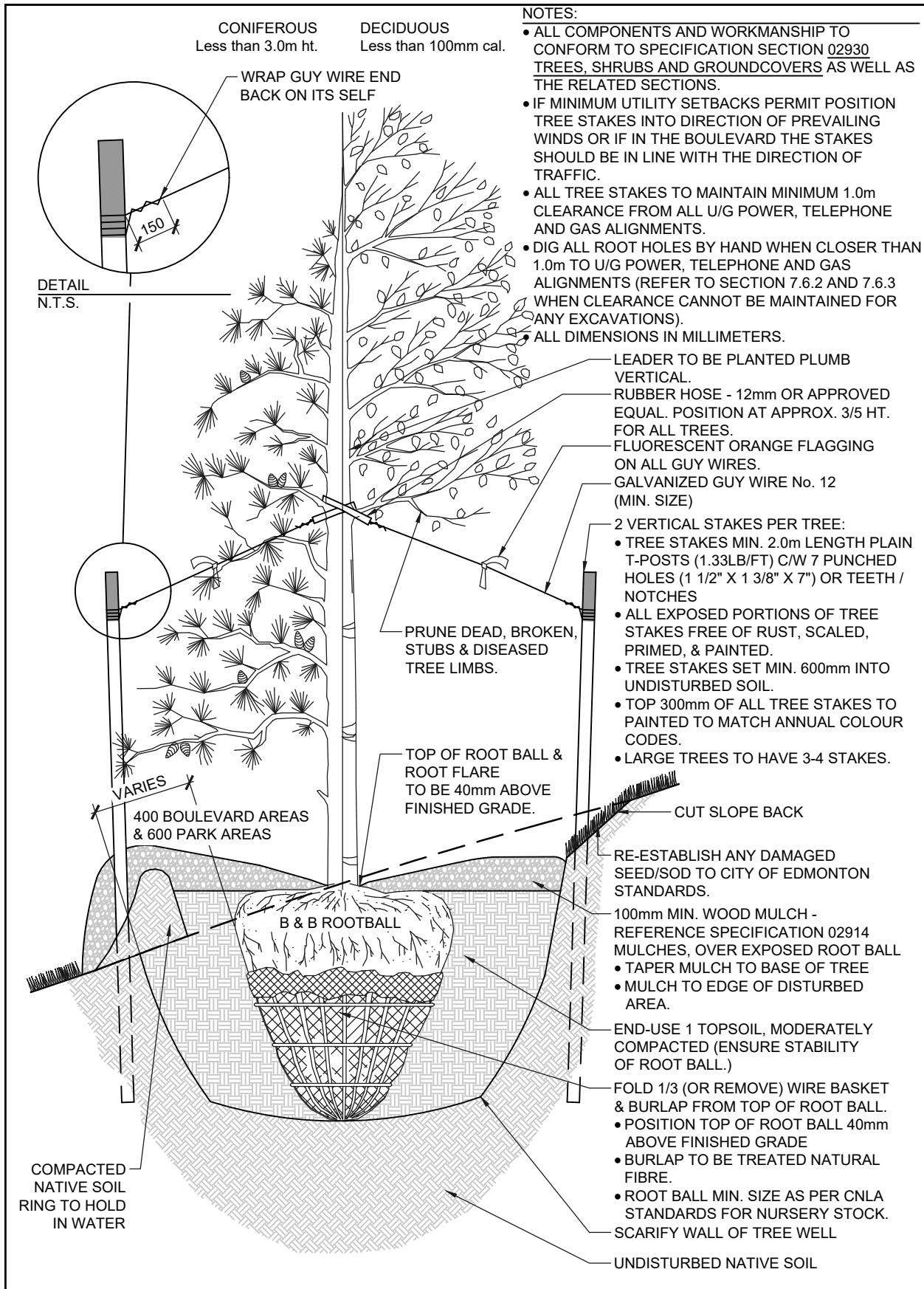
• SPECIFICATIONS: ALL COMPONENTS AND WORKMANSHIP CONFORM TO SPECIFICATION SECTION 02930 TREES, SHRUBS AND GROUNDCOVERS AS WELL AS THE RELATED SECTIONS.

• DIG ALL ROOT HOLES BY HAND WHEN CLOSER THAN 1.0m TO U/G POWER, TELEPHONE AND GAS ALIGNMENTS (REFER TO SECTION 7.6.2 AND 7.6.3 WHEN CLEARANCE CANNOT BE MAINTAINED FOR ANY EXCAVATIONS).



TYPICAL TREE GRATE PLANTING

Date Approved: FEB 2021	Drawn By: DEDR	Approved: 	Revision	Drawing No. LA106
Scale: N.T.S.	Checked By: OPEN SPACE DESIGN			Old Drawing No. SP400h



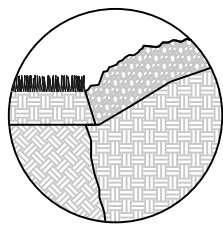
TYPICAL TREE PLANTING ON SLOPE

Date Approved: FEB 2021	Drawn By: DEDR	Approved:	Revision	Drawing No. LA107
Scale: N.T.S.	Checked By: OPEN SPACE DESIGN			Old Drawing No. SP400i

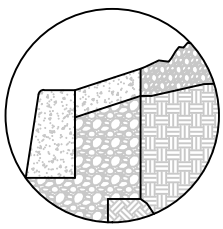
Date Approved: FEB 2021	Drawn By: DEDR	Approved:
Scale: N.T.S.	Checked by: OPEN SPACE DESIGN	Revision:
		Drawing No. LA 108
		Job Drawing No.



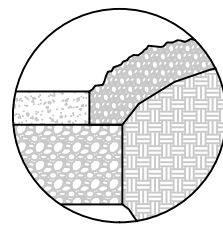
TYPICAL TREE PLANTING BED



OPTION 'A'
EDGING DETAIL
N.T.S.



OPTION 'B'
CONCRETE CURB DETAIL
N.T.S.

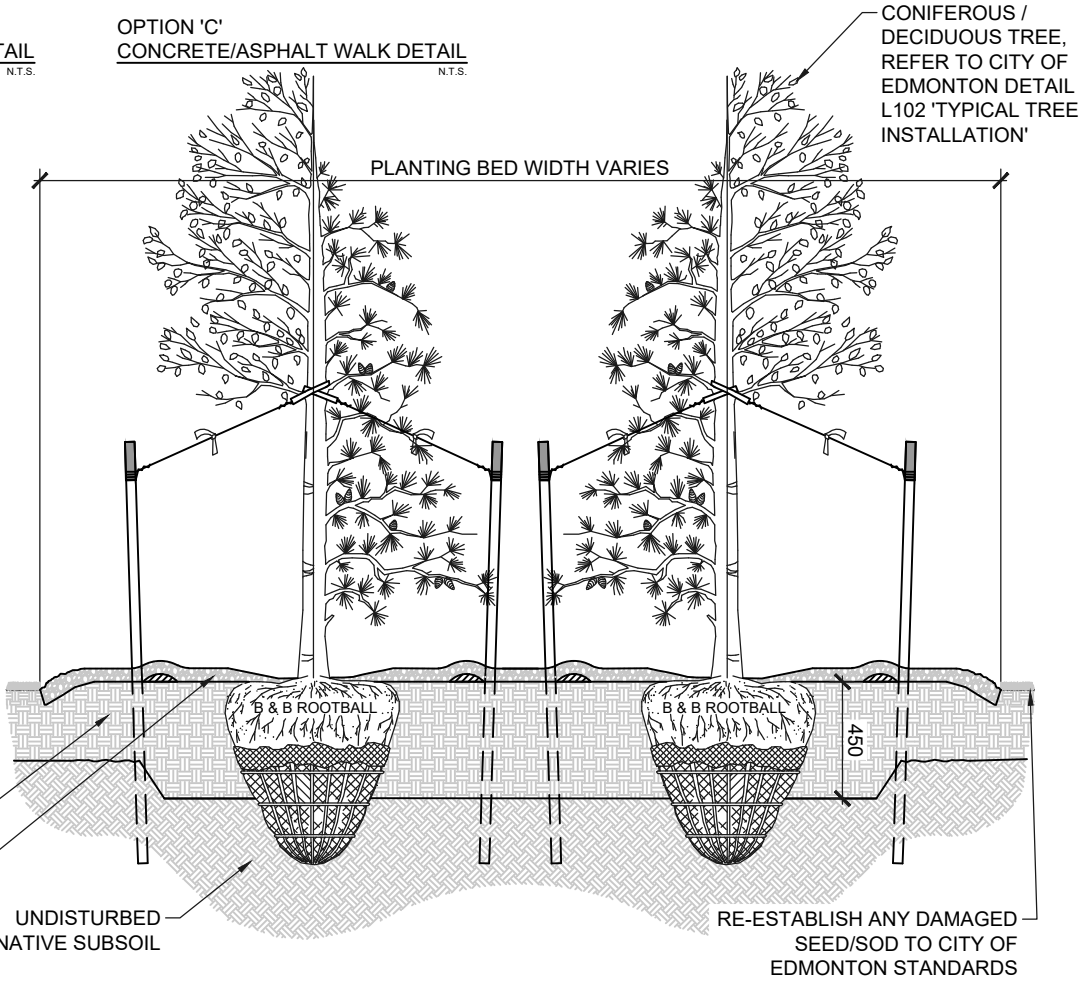


OPTION 'C'
CONCRETE/ASPHALT WALK DETAIL
N.T.S.

- OPTIONS:
- A: EDGING DETAIL
 - B: CONCRETE CURB DETAIL
 - C: CONCRETE/ASPHALT WALK DETAIL

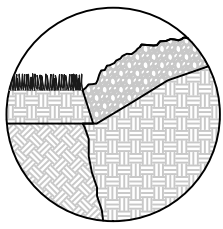
- NOTES:
- ALL COMPONENTS AND WORKMANSHIP TO CONFORM TO SPECIFICATION SECTION 02930 TREES, SHRUBS AND GROUNDCOVERS AS WELL AS THE RELATED SECTIONS.
 - IF MINIMUM UTILITY SETBACKS PERMIT POSITION TREE STAKES INTO DIRECTION OF PREVAILING WINDS OR IF IN THE BOULEVARD THE STAKES SHOULD BE IN LINE WITH THE DIRECTION OF TRAFFIC.
 - ALL TREE STAKES TO MAINTAIN MINIMUM 1.0m CLEARANCE FROM ALL U/G POWER, TELEPHONE AND GAS ALIGNMENTS.
 - DIG ALL ROOT HOLES BY HAND WHEN CLOSER THAN 1.0m TO U/G POWER, TELEPHONE AND GAS ALIGNMENTS (REFER TO SECTION 7.6.2 AND 7.6.3 WHEN CLEARANCE CANNOT BE MAINTAINED FOR ANY EXCAVATIONS).
 - ALL DIMENSIONS IN MILLIMETERS.

- 450mm MIN. DEPTH END-USE 1 TOPSOIL, MODERATELY COMPACTED. ENSURE STABILITY OF ROOT BALL
- 100mm MIN. WOOD MULCH - REFERENCE SPECIFICATION 02914 MULCHES, OVER EXPOSED ROOT BALL
 - TAPER MULCH TO BASE OF TREE
 - MULCH TO EDGE OF DISTURBED AREA.

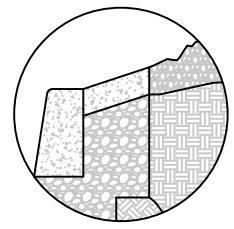


Date Approved: FEB 2021	Drawn By: DEDR	Approved:
Scale: N.T.S.	Checked By: OPEN SPACE DESIGN	
		Revision
	Drawing No. LA108A	Old Drawing No. LA108

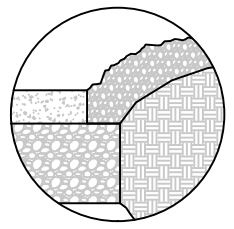
Edmonton THE CITY OF
TYPICAL TREE AND SHRUB PLANTING BED



OPTION 'A'
 EDGING DETAIL
 N.T.S.



OPTION 'B'
 CONCRETE CURB DETAIL
 N.T.S.



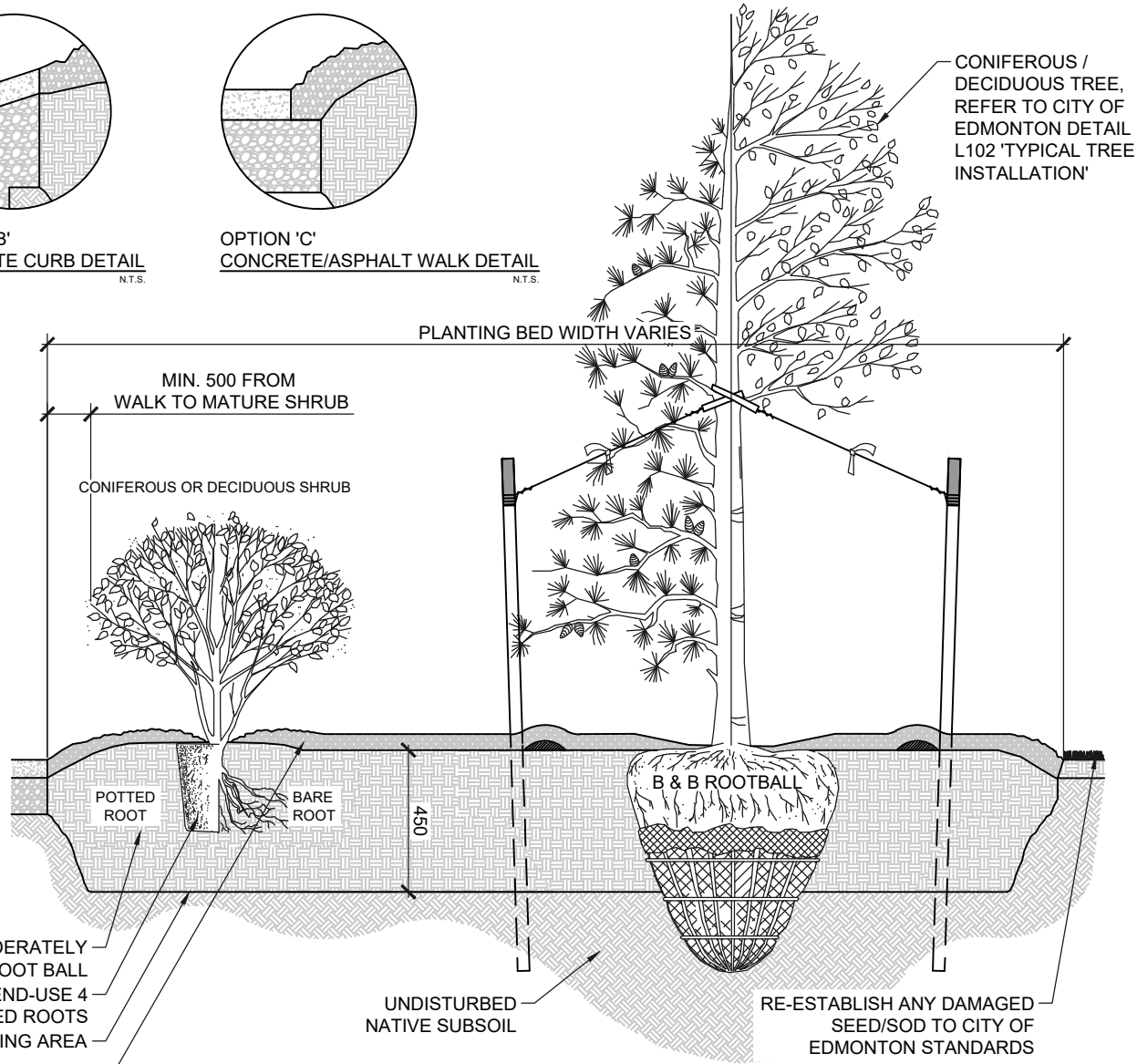
OPTION 'C'
 CONCRETE/ASPHALT WALK DETAIL
 N.T.S.

- OPTIONS:
 A: EDGING DETAIL
 B: CONCRETE CURB DETAIL
 C: CONCRETE/ASPHALT WALK DETAIL

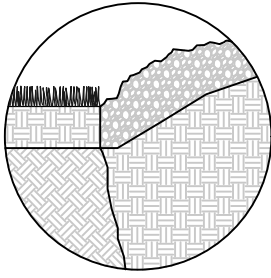
- NOTES:
- ALL COMPONENTS AND WORKMANSHIP TO CONFORM TO SPECIFICATION SECTION 02930 TREES, SHRUBS AND GROUNDCOVERS AS WELL AS THE RELATED SECTIONS.
 - IF MINIMUM UTILITY SETBACKS PERMIT POSITION TREE STAKES INTO DIRECTION OF PREVAILING WINDS OR IF IN THE BOULEVARD THE STAKES SHOULD BE IN LINE WITH THE DIRECTION OF TRAFFIC.
 - ALL TREE STAKES TO MAINTAIN MINIMUM 1.0m CLEARANCE FROM ALL U/G POWER, TELEPHONE AND GAS ALIGNMENTS.
 - DIG ALL ROOT HOLES BY HAND WHEN CLOSER THAN 1.0m TO U/G POWER, TELEPHONE AND GAS ALIGNMENTS (REFER TO SECTION 7.6.2 AND 7.6.3 WHEN CLEARANCE CANNOT BE MAINTAINED FOR ANY EXCAVATIONS).
 - ALL DIMENSIONS IN MILLIMETERS.

450mm MIN. DEPTH END-USE 4 TOPSOIL, MODERATELY COMPACTED. ENSURE STABILITY OF ROOT BALL SPREAD ROOTS EVENLY THROUGHOUT END-USE 4 TOPSOIL. PRUNE ALL DAMAGED ROOTS SCARIFY BASE OF PLANTING AREA

100mm MIN. WOOD MULCH - REFERENCE SPECIFICATION 02914 MULCHES, TAPER MULCH TO BASE OF SHRUB

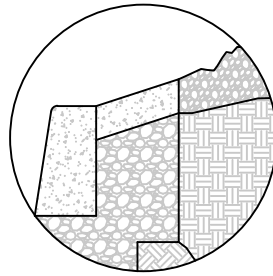


CONIFEROUS / DECIDUOUS TREE, REFER TO CITY OF EDMONTON DETAIL L102 'TYPICAL TREE INSTALLATION'



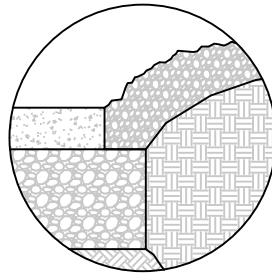
OPTION 'A'
EDGING DETAIL

N.T.S.



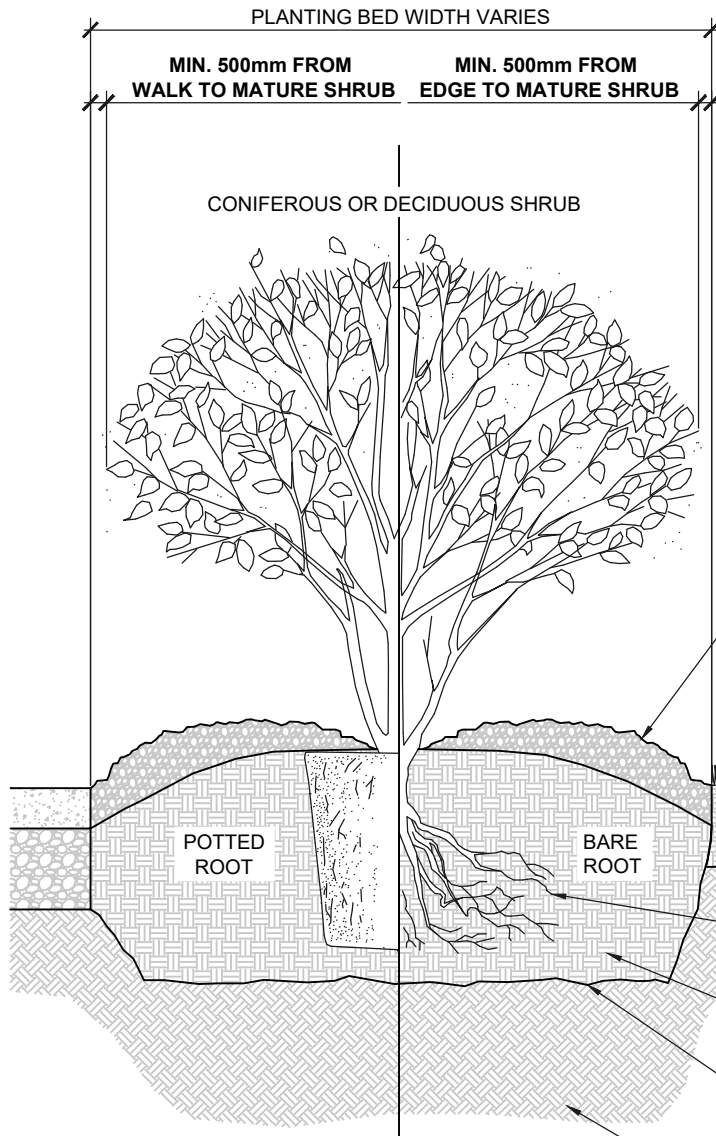
OPTION 'B'
CONCRETE CURB DETAIL

N.T.S.



OPTION 'C'
CONCRETE WALK DETAIL

N.T.S.



NOTES:

- SPECIFICATIONS: ALL COMPONENTS AND WORKMANSHIP CONFORM TO SPECIFICATION SECTION 02930 TREES, SHRUBS AND GROUNDCOVERS AS WELL AS THE RELATED SECTIONS.
- PRUNE ONLY DEAD, BROKEN OR DISEASED BRANCHES TO MAINTAIN PROPER SHRUB FORM (DECIDUOUS ONLY).
- DO NOT ROTOTILL WITHIN 1.0m OF U/G POWER, TELEPHONE AND GAS ALIGNMENTS.
- DIG ALL ROOT HOLES BY HAND WHEN CLOSER THAN 1.0m TO U/G POWER, TELEPHONE AND GAS ALIGNMENTS.

100mm MIN. MULCH. CONIFEROUS SHREDDED BARK OR APPROVED EQUAL. TAPER MULCH TO BASE OF SHRUB.

RE-ESTABLISH ANY DAMAGED SEED/SOD TO CITY OF EDMONTON STANDARDS.

SPREAD ROOTS EVENLY THROUGHOUT END-USE 4 TOPSOIL. PRUNE ALL DAMAGED ROOTS.

450mm MIN. DEPTH END-USE 4 TOPSOIL, MODERATELY COMPACTED. ENSURE STABILITY OF ROOT BALL.

SCARIFY BASE OF PLANTING AREA


UNDISTURBED NATIVE SUBSOIL.

OPTIONS:

- A: EDGING DETAIL
- B: CONCRETE CURB W/ VERGE DETAIL
- C: CONCRETE/ASPHALT WALK DETAIL

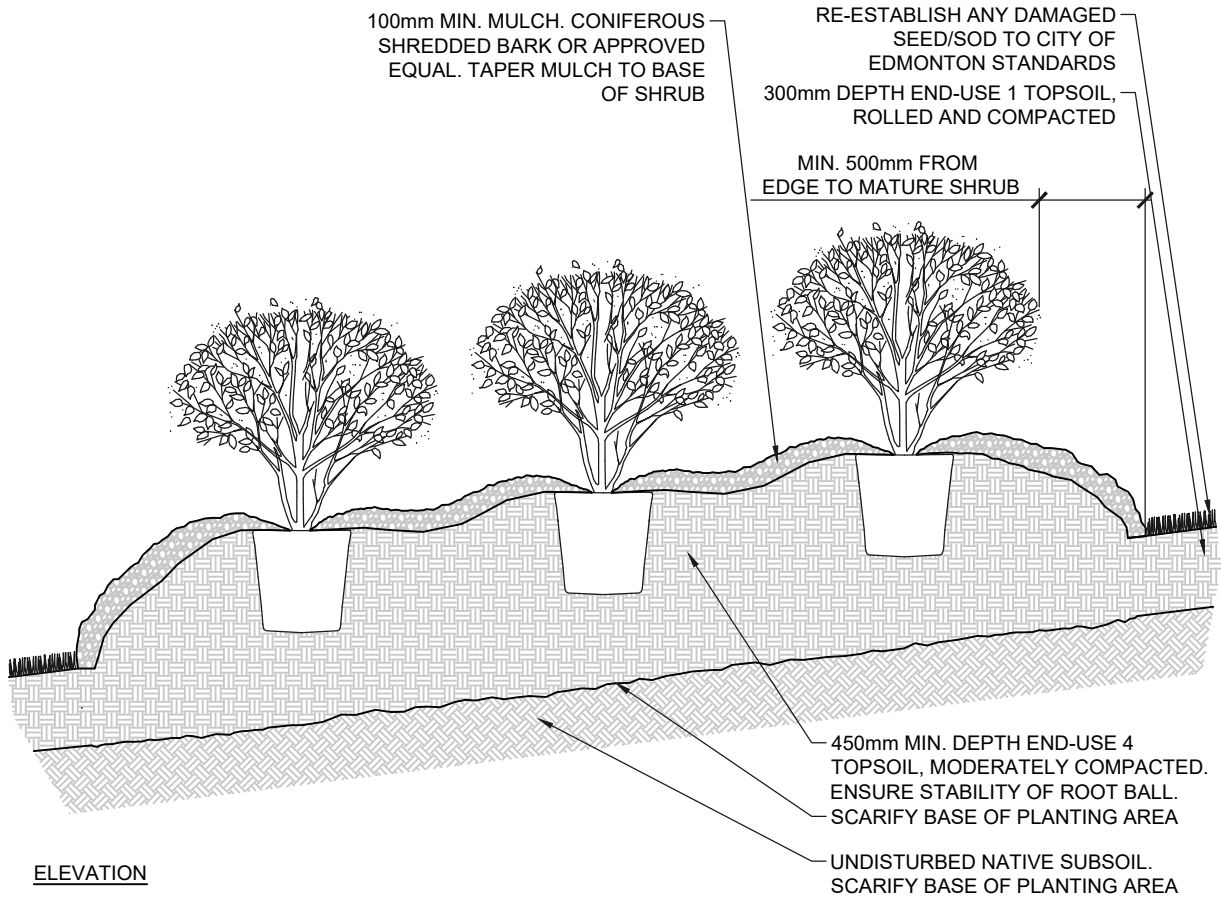
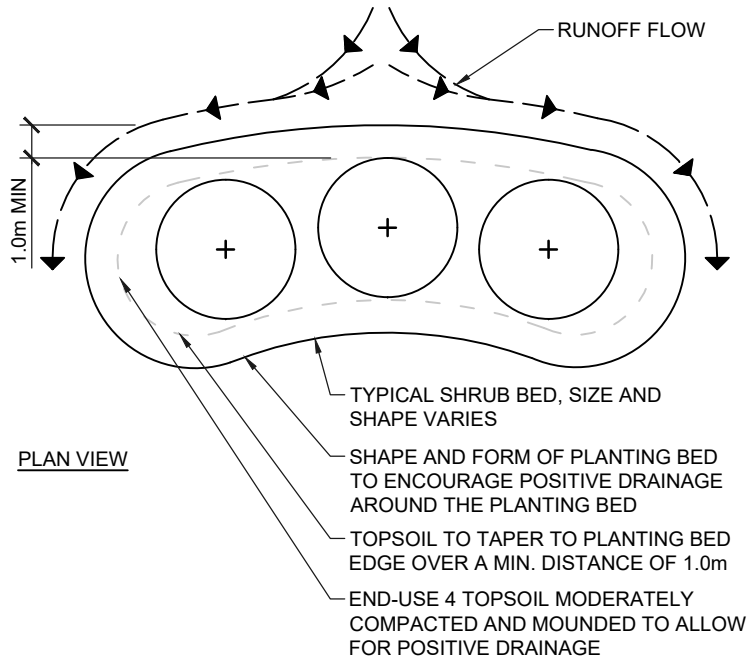


TYPICAL SHRUB PLANTING

Date Approved: FEB 2021	Drawn By: DEDR	Approved:	Revision	Drawing No. LA108B
Scale: N.T.S.	Checked By: OPEN SPACE DESIGN			Old Drawing No. LA108

NOTES:

- SPECIFICATIONS: ALL COMPONENTS AND WORKMANSHIP CONFORM TO SPECIFICATION SECTION 02930 TREES, SHRUBS AND GROUNDCOVERS AS WELL AS THE RELATED SECTIONS.
- PRUNE ONLY DEAD, BROKEN OR DISEASED BRANCHES TO MAINTAIN PROPER SHRUB FORM (DECIDUOUS ONLY).
- DO NOT ROTOTILL WITHIN 1.0m OF U/G POWER, TELEPHONE AND GAS ALIGNMENTS.
- DIG ALL ROOT HOLES BY HAND WHEN CLOSER THAN 1.0m TO U/G POWER, TELEPHONE AND GAS ALIGNMENTS.

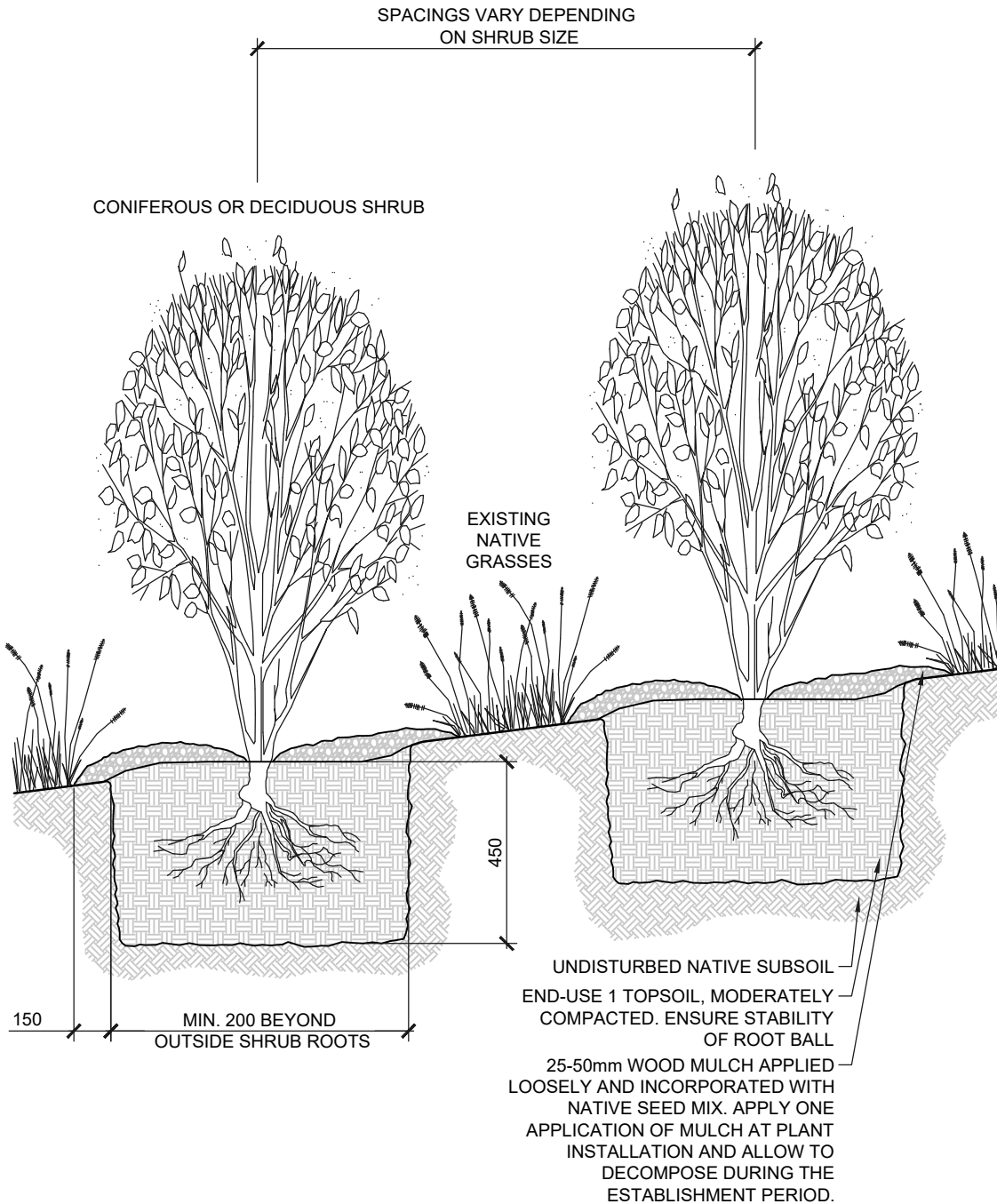


TYPICAL SHRUB PLANTING BED ON A SLOPE

Date Approved: FEB 2021	Drawn By: DEDR	Approved:	Revision	Drawing No. LA109
Scale: N.T.S.	Checked By: OPEN SPACE DESIGN			Old Drawing No. SP401b

NOTES:

- SPECIFICATIONS: ALL COMPONENTS AND WORKMANSHIP CONFORM TO SPECIFICATION SECTION 02931 NATURALIZATION AS WELL AS THE RELATED SECTIONS.
- PRUNE ONLY DEAD, BROKEN OR DISEASED BRANCHES TO MAINTAIN PROPER SHRUB FORM (DECIDUOUS ONLY).
- DIG ALL ROOT HOLES BY HAND WHEN CLOSER THAN 1.0m TO U/G POWER, TELEPHONE AND GAS ALIGNMENTS (REFER TO SECTION 7.6.2 AND 7.6.3 WHEN CLEARANCE CANNOT BE MAINTAINED FOR ANY EXCAVATIONS).
- ALL DIMENSIONS IN MILLIMETERS.



NATURAL AREA SHRUB RESTORATION

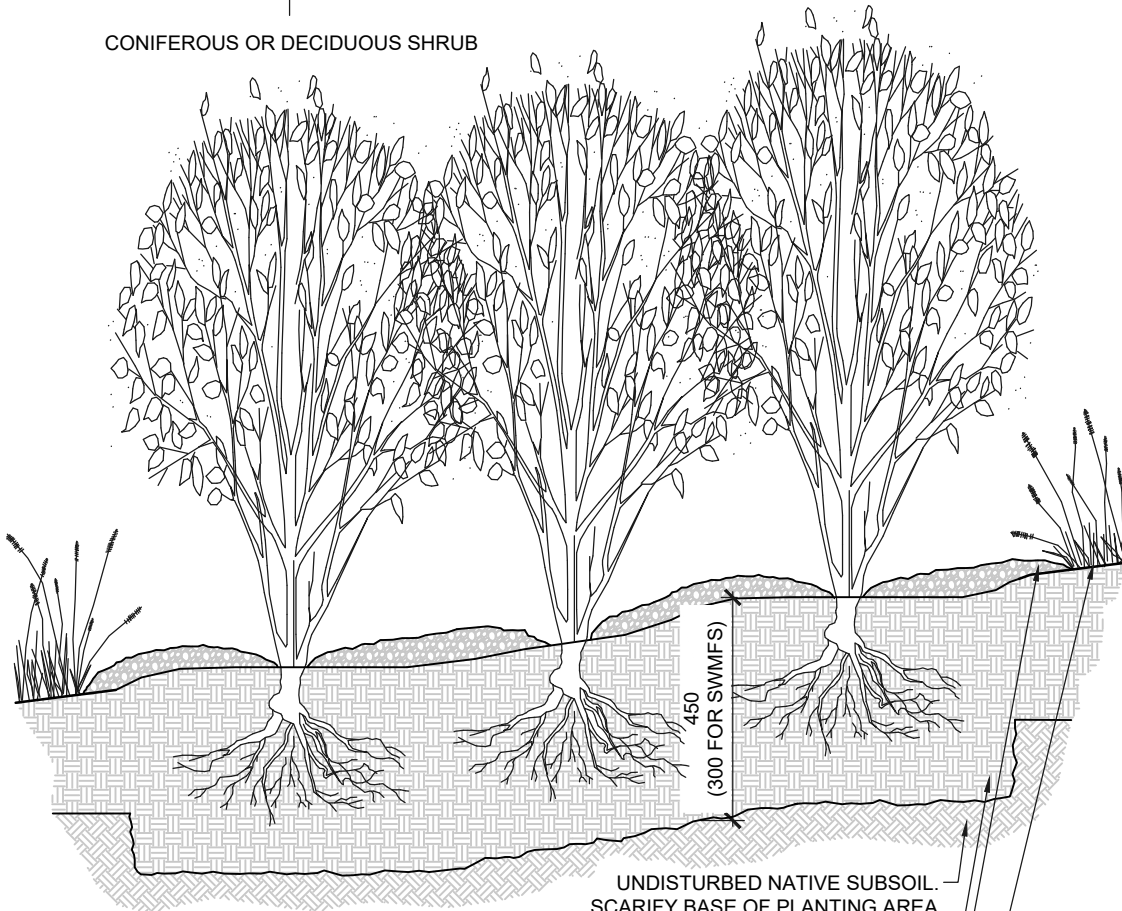
Date Approved: FEB 2021	Drawn By: DEDR	Approved:	Revision	Drawing No. LA110A
Scale: N.T.S.	Checked By: OPEN SPACE DESIGN			Old Drawing No. LA110

NOTES:

- SPECIFICATIONS: ALL COMPONENTS AND WORKMANSHIP CONFORM TO SPECIFICATION SECTION 02931 NATURALIZATION AS WELL AS THE RELATED SECTIONS.
- PRUNE ONLY DEAD, BROKEN OR DISEASED BRANCHES TO MAINTAIN PROPER SHRUB FORM (DECIDUOUS ONLY).
- DIG ALL ROOT HOLES BY HAND WHEN CLOSER THAN 1.0m TO U/G POWER, TELEPHONE AND GAS ALIGNMENTS (REFER TO SECTION 7.6.2 AND 7.6.3 WHEN CLEARANCE CANNOT BE MAINTAINED FOR ANY EXCAVATIONS).
- ALL DIMENSIONS IN MILLIMETERS.

SPACINGS VARY DEPENDING ON SHRUB SIZE
OVERLAP ACCEPTED ONLY IN NATURAL SITES

CONIFEROUS OR DECIDUOUS SHRUB



UNDISTURBED NATIVE SUBSOIL.
SCARIFY BASE OF PLANTING AREA
END-USE 1 TOPSOIL, MODERATELY COMPACTED.
ENSURE STABILITY OF ROOT BALL
25-50mm WOOD MULCH APPLIED LOOSELY AND
INCORPORATED WITH NATIVE SEED MIX. APPLY ONE
APPLICATION OF MULCH AT PLANT INSTALLATION AND
ALLOW TO DECOMPOSE DURING THE ESTABLISHMENT
PERIOD.
NATURALIZED TURF SEED ON 300mm DEPTH END-USE 1
TOPSOIL

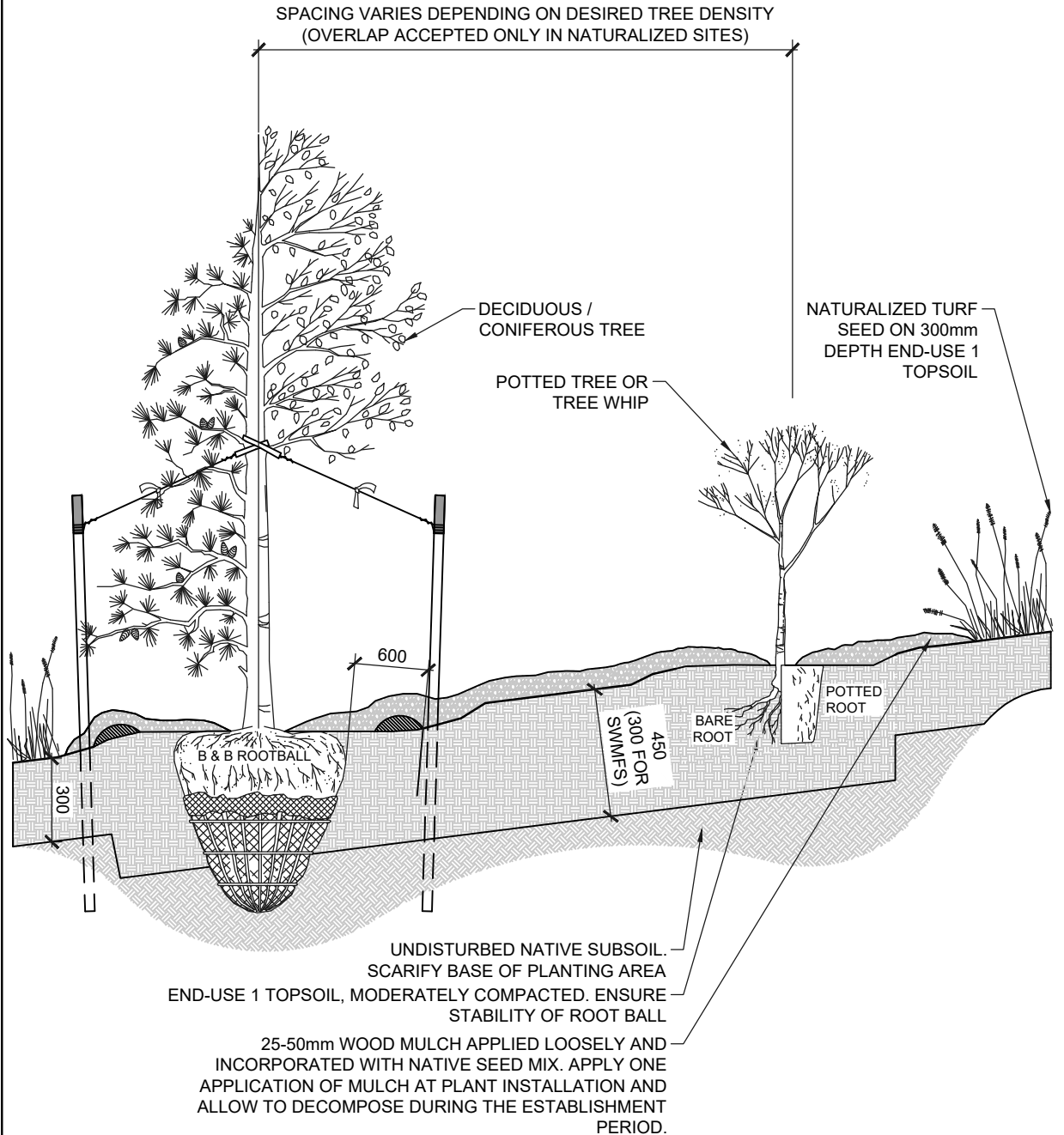


TYPICAL SHRUB NATURALIZATION


Date Approved: FEB 2021	Drawn By: DEDR	Approved:	Revision	Drawing No. LA110B
Scale: N.T.S.	Checked By: OPEN SPACE DESIGN			Old Drawing No. LA110

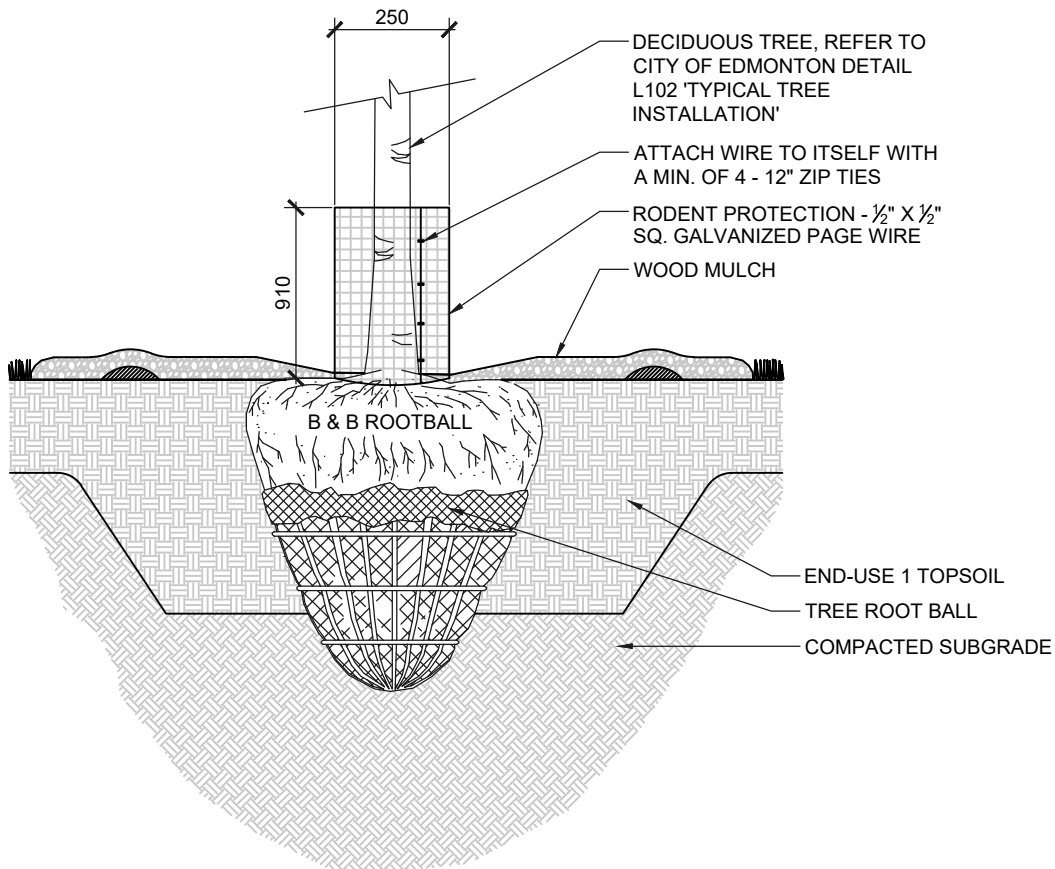
NOTES:

- ALL COMPONENTS AND WORKMANSHIP TO CONFORM TO SPECIFICATION SECTION 02931 NATURALIZATION AS WELL AS THE RELATED SECTIONS.
- PRUNE ONLY DEAD, BROKEN OR DISEASED BRANCHES TO MAINTAIN PROPER SHRUB FORM (DECIDUOUS ONLY).
- ALL TREE STAKES TO MAINTAIN MINIMUM 1.0m CLEARANCE FROM ALL U/G POWER, TELEPHONE AND GAS ALIGNMENTS.
- IF MINIMUM UTILITY SETBACKS PERMIT POSITION TREE STAKES INTO DIRECTION OF PREVAILING WINDS OR IF IN THE BOULEVARD THE STAKES SHOULD BE IN LINE WITH THE DIRECTION OF TRAFFIC.
- DIG ALL ROOT HOLES BY HAND WHEN CLOSER THAN 1.0m TO U/G POWER, TELEPHONE AND GAS ALIGNMENTS (REFER TO SECTION 7.6.2 AND 7.6.3 WHEN CLEARANCE CANNOT BE MAINTAINED FOR ANY EXCAVATIONS).
- ALL DIMENSIONS IN MILLIMETERS.



THE CITY OF
Edmonton TYPICAL TREE NATURALIZATION

Date Approved: FEB 2021	Drawn By: DEDR	Approved:	Revision	Drawing No. LA111
Scale: N.T.S.	Checked By: OPEN SPACE DESIGN			Old Drawing No. N/A



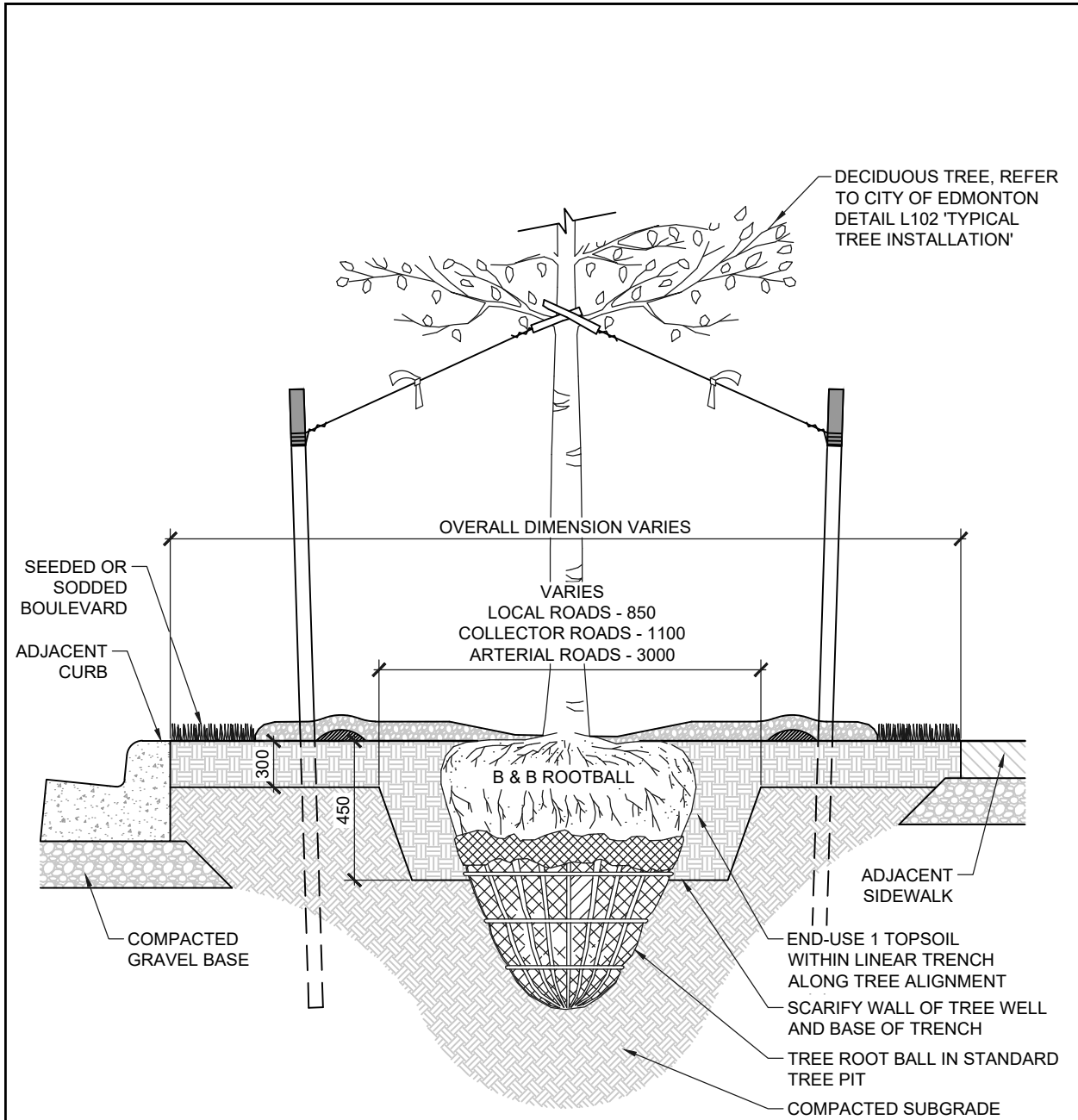
NOTES:

- ALL COMPONENTS AND WORKMANSHIP TO CONFORM TO SPECIFICATION SECTION 02930 TREES, SHRUBS AND GROUNDCOVERS AS WELL AS THE RELATED SECTIONS.
- IF MINIMUM UTILITY SETBACKS PERMIT POSITION TREE STAKES INTO DIRECTION OF PREVAILING WINDS.
- DIG ALL ROOT HOLES BY HAND WHEN CLOSER THAN 1.0m TO U/G POWER, TELEPHONE AND GAS ALIGNMENTS (REFER TO SECTION 7.6.2 AND 7.6.3 WHEN CLEARANCE CANNOT BE MAINTAINED FOR ANY EXCAVATIONS).
- ENSURE RODENT PROTECTION IS INSTALLED TO TOP OF ROOT BALL BELOW ANY WOOD MULCH.
- ALL DIMENSIONS IN MILLIMETERS.
- ALL OTHER MATERIALS WILL NOT BE ACCEPTED.
- THE CITY WILL REMOVE RODENT PROTECTION FROM THE TREE AFTER FAC AT FORESTRY'S DISCRETION.



TYPICAL TREE RODENT PROTECTION

Date Approved: FEB 2021	Drawn By: DEDR	Approved:	Revision	Drawing No. LA112
Scale: N.T.S.	Checked By: OPEN SPACE DESIGN			Old Drawing No. N/A



- NOTES:**
- ALL COMPONENTS AND WORKMANSHIP TO CONFORM TO SPECIFICATION SECTION 02931 NATURALIZATION AS WELL AS THE RELATED SECTIONS.
 - ALL TREE STAKES TO MAINTAIN MINIMUM 1.0m CLEARANCE FROM ALL U/G POWER, TELECOMMUNICATIONS, STREETLIGHT, AND GAS.
 - IF MINIMUM UTILITY SETBACKS PERMIT POSITION TREE STAKES INTO DIRECTION OF PREVAILING WINDS OR IF IN THE BOULEVARD THE STAKES SHOULD BE IN LINE WITH THE DIRECTION OF TRAFFIC.
 - DIG ALL ROOT HOLES BY HAND WHEN CLOSER THAN 1.0m TO U/G POWER, TELEPHONE AND GAS ALIGNMENTS (REFER TO SECTION 7.6.2 AND 7.6.3 WHEN CLEARANCE CANNOT BE MAINTAINED FOR ANY EXCAVATIONS).
 - ALL DIMENSIONS IN MILLIMETERS.

THE CITY OF Edmonton TYPICAL TREE ROOT TRENCH

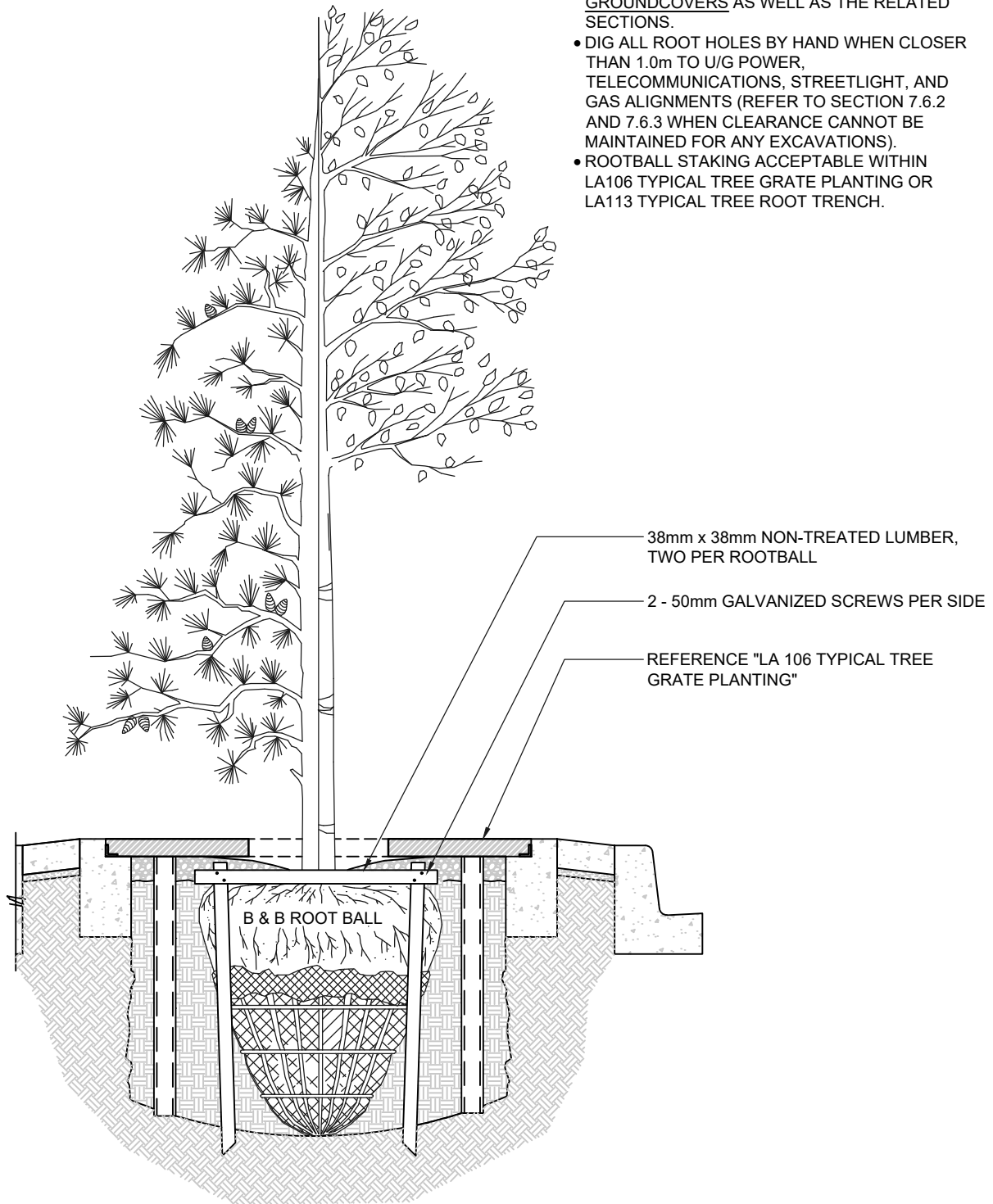
Date Approved: FEB 2021	Drawn By: DEDR	Approved:	Revision	Drawing No. LA113
Scale: N.T.S.	Checked By: OPEN SPACE DESIGN	<i>M.C. [Signature]</i>		Old Drawing No. N/A

CONIFEROUS
Less than 3.0m ht.

DECIDUOUS
Less than 100mm cal.

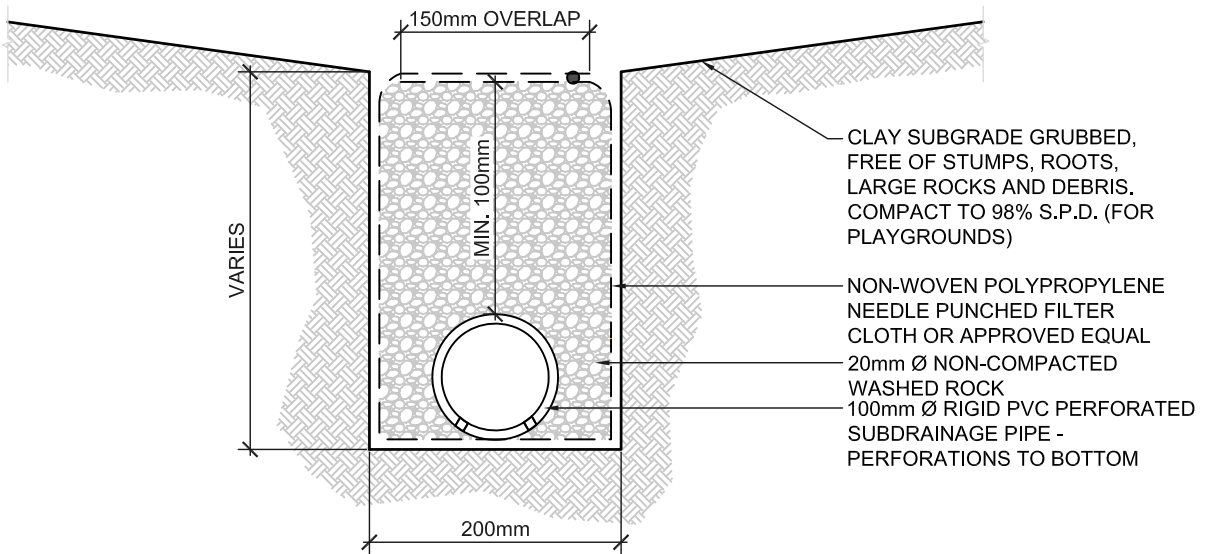
NOTES:

- SPECIFICATIONS: ALL COMPONENTS AND WORKMANSHIP CONFORM TO SPECIFICATION SECTION 02930 TREES, SHRUBS AND GROUNDCOVERS AS WELL AS THE RELATED SECTIONS.
- DIG ALL ROOT HOLES BY HAND WHEN CLOSER THAN 1.0m TO U/G POWER, TELECOMMUNICATIONS, STREETLIGHT, AND GAS ALIGNMENTS (REFER TO SECTION 7.6.2 AND 7.6.3 WHEN CLEARANCE CANNOT BE MAINTAINED FOR ANY EXCAVATIONS).
- ROOTBALL STAKING ACCEPTABLE WITHIN LA106 TYPICAL TREE GRATE PLANTING OR LA113 TYPICAL TREE ROOT TRENCH.

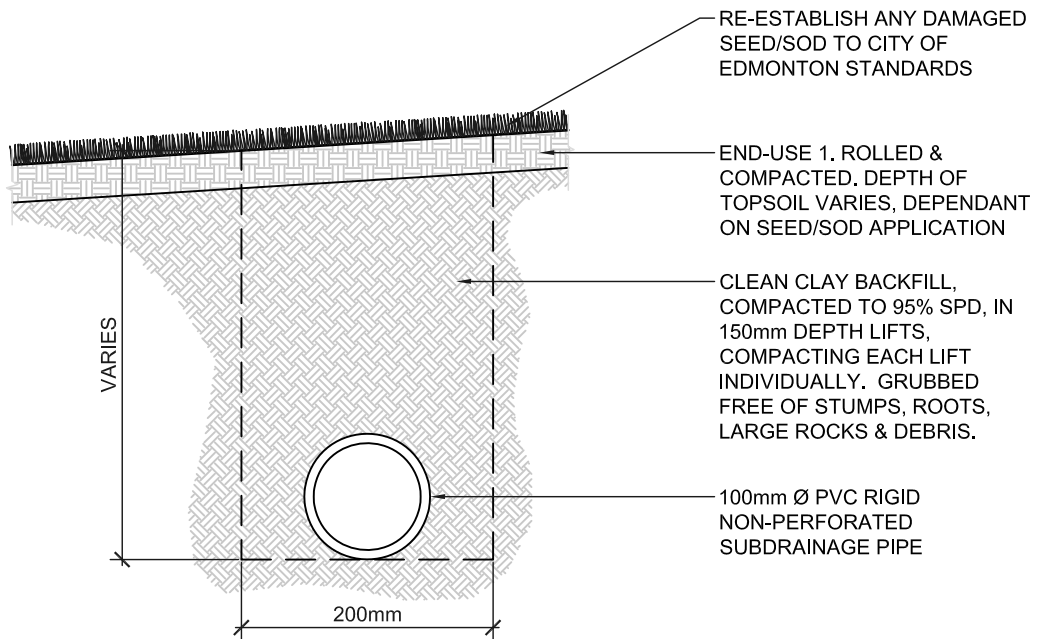


TYPICAL TREE ROOTBALL STAKING

Date Approved: FEB 2021	Drawn By: DEDR	Approved:	Revision	Drawing No. LA114
Scale: N.T.S.	Checked By: OPEN SPACE DESIGN			Old Drawing No. N/A



PERFORATED SUBDRAINAGE PIPE




NON-PERFORATED SUBDRAINAGE PIPE

NOTES:

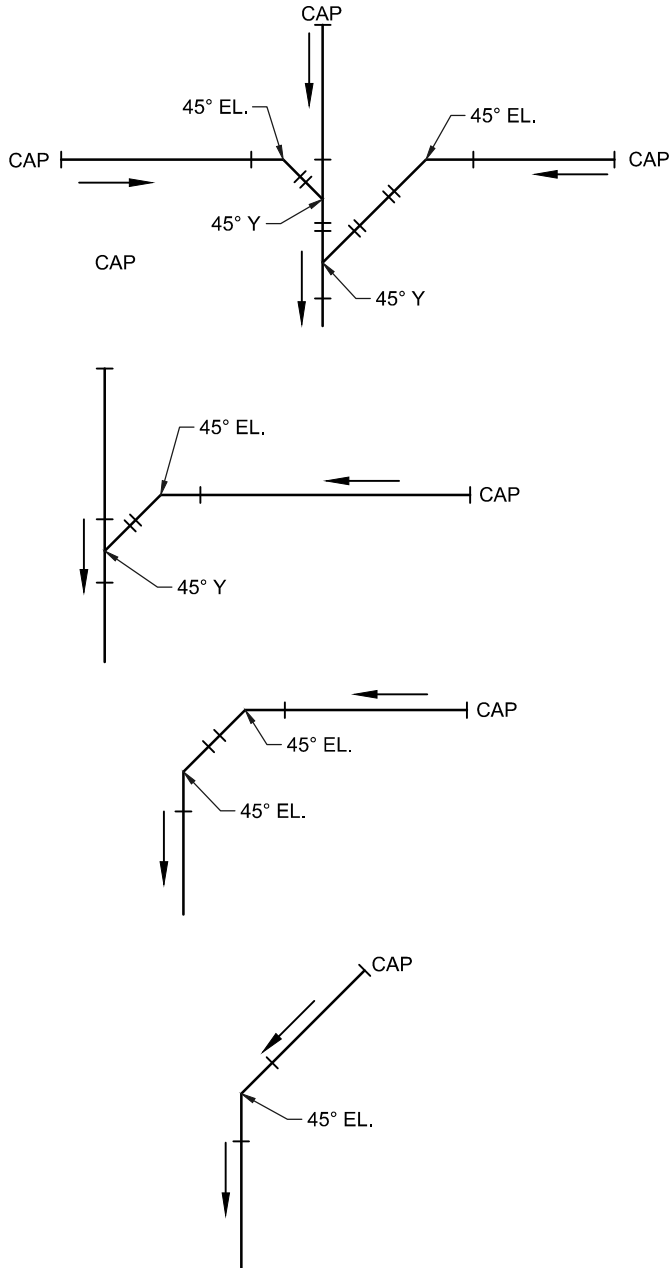
- A DRAINAGE SUMP IS NOT PERMITTED UNLESS THERE IS NO ACCEPTABLE DRAINAGE ALTERNATIVE, WHICH SHALL BE SUBJECT TO APPROVAL. DRAINAGE SHALL BE CONNECTED TO THE CITY OF EDMONTON DRAINAGE INFRASTRUCTURE, SUCH AS A MANHOLE OR CATCH BASIN LOCATED ON PRIVATE PROPERTY.
- MINIMUM 2.0% SLOPE ON ALL SUBDRAINAGE PIPE
- ALL DIMENSIONS IN MILLIMETERS UNLESS NOTED OTHERWISE



SUBDRAINAGE PIPE INSTALLATION

Date Approved: FEB 2021	Drawn By: DEDR	Approved:	Revision	Drawing No. LA200
Scale: N.T.S.	Checked By: OPEN SPACE DESIGN			Old Drawing No. SP105a

ACTUAL CONNECTIONS TO BE SHOWN ON ALL CONSTRUCTION DRAWING

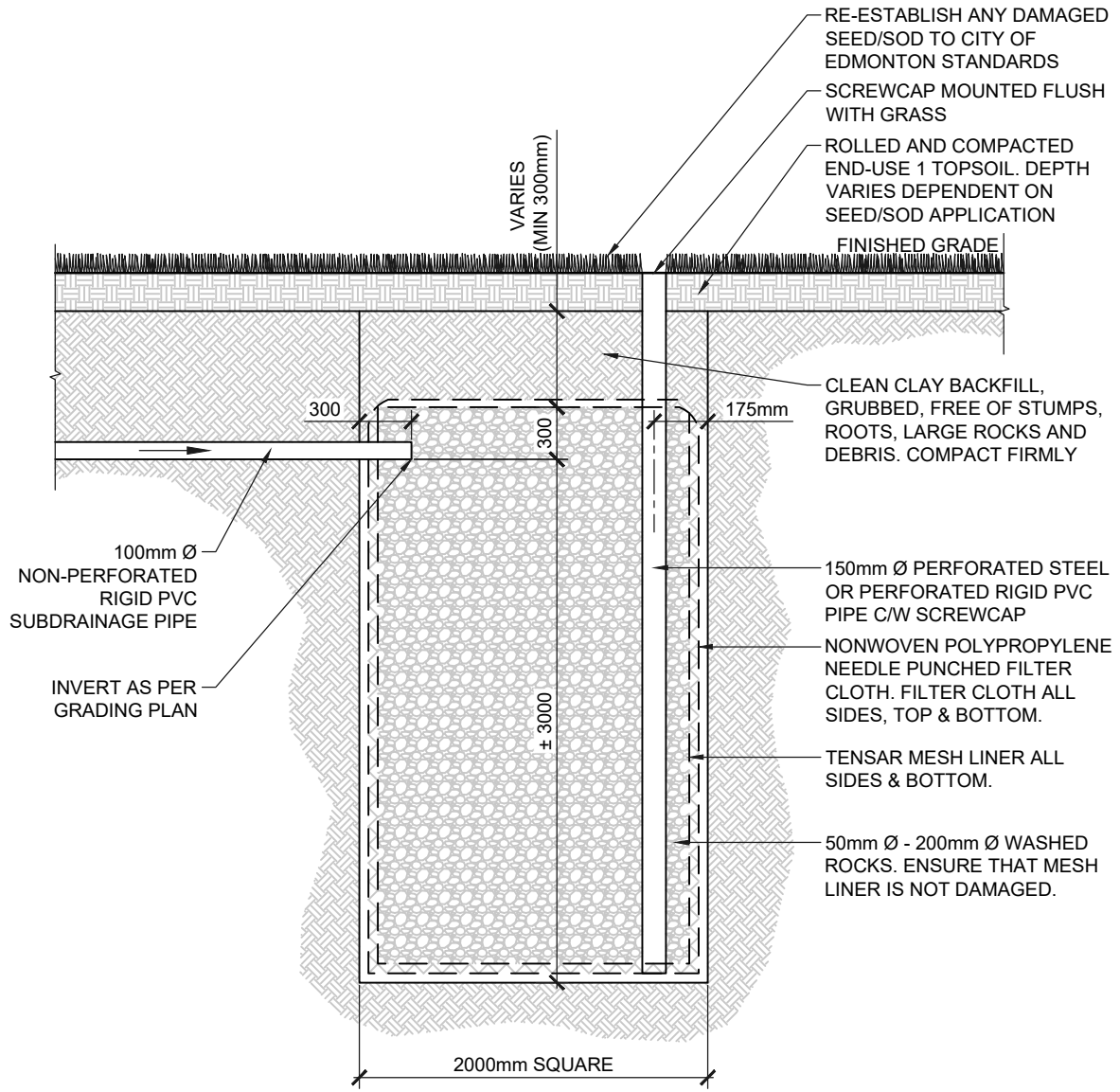


LEGEND:	
EL.	ELBOW
←	FLOW DIRECTION

NOTES:
 • MINIMUM 2.0% SLOPE ON ALL SUBDRAINAGE PIPE.

THE CITY OF Edmonton TYPICAL SUBDRAINAGE PIPE CONNECTIONS

Date Approved: JUNE 2017	Drawn By: PARKS PLANNING	Approved: 	Revision	Drawing No. LA201
Scale: N.T.S.	Checked By: PARKS PLANNING			Old Drawing No. SP105



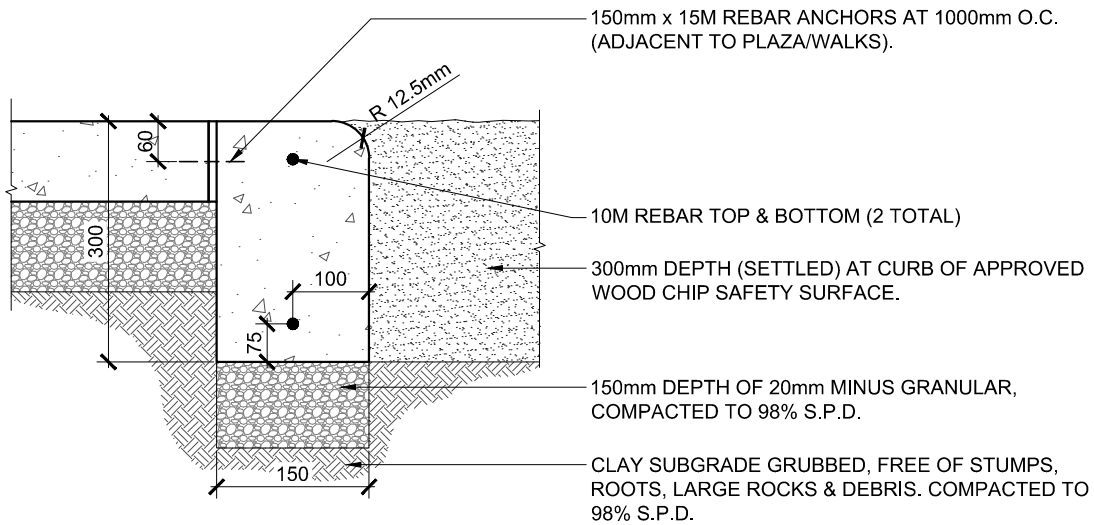
NOTES:

- A DRAINAGE SUMP IS NOT PERMITTED UNLESS THERE IS NO ACCEPTABLE DRAINAGE ALTERNATIVE, WHICH SHALL BE SUBJECT TO APPROVAL. DRAINAGE SHALL BE CONNECTED TO THE CITY OF EDMONTON DRAINAGE INFRASTRUCTURE, SUCH AS A MANHOLE OR CATCH BASIN LOCATED ON PRIVATE PROPERTY.
- SPECIFICATIONS: ALL COMPONENTS AND WORKMANSHIP CONFORM TO SPECIFICATION SECTION 02318 TRENCH AND BACKFILL AS WELL AS RELATED SECTIONS.

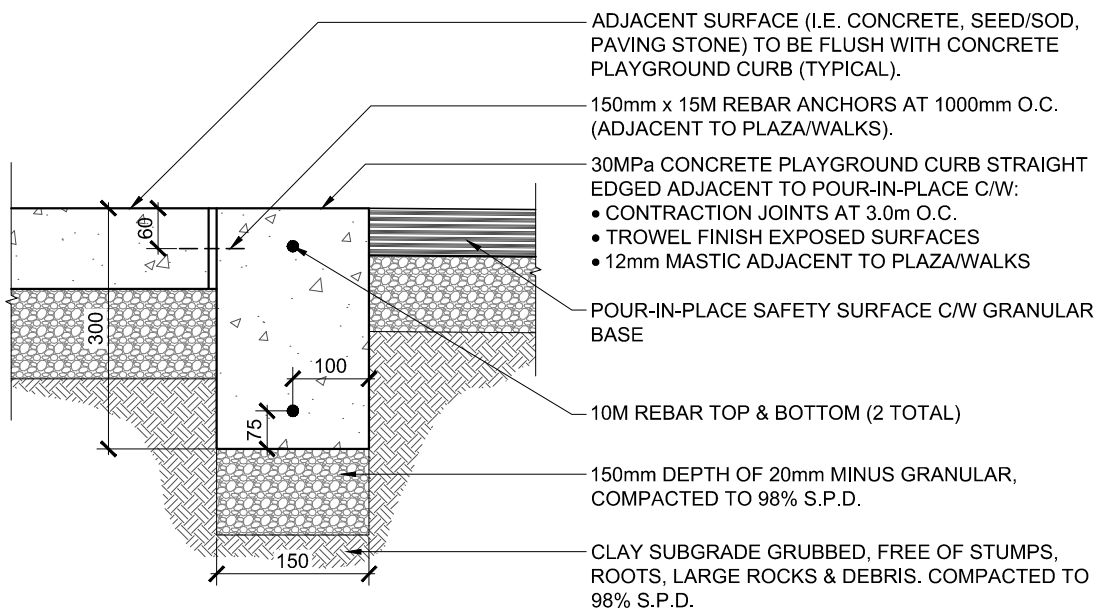


PLAYGROUND DRAINAGE SUMP

Date Approved: FEB 2021	Drawn By: DEDR	Approved: 	Revision	Drawing No. LA202
Scale: N.T.S.	Checked by: OPEN SPACE DESIGN			Old Drawing No. SP105b



PLAYGROUND CURB ADJACENT WOOD MULCH



PLAYGROUND CURB ADJACENT POUR-IN-PLACE SURFACE

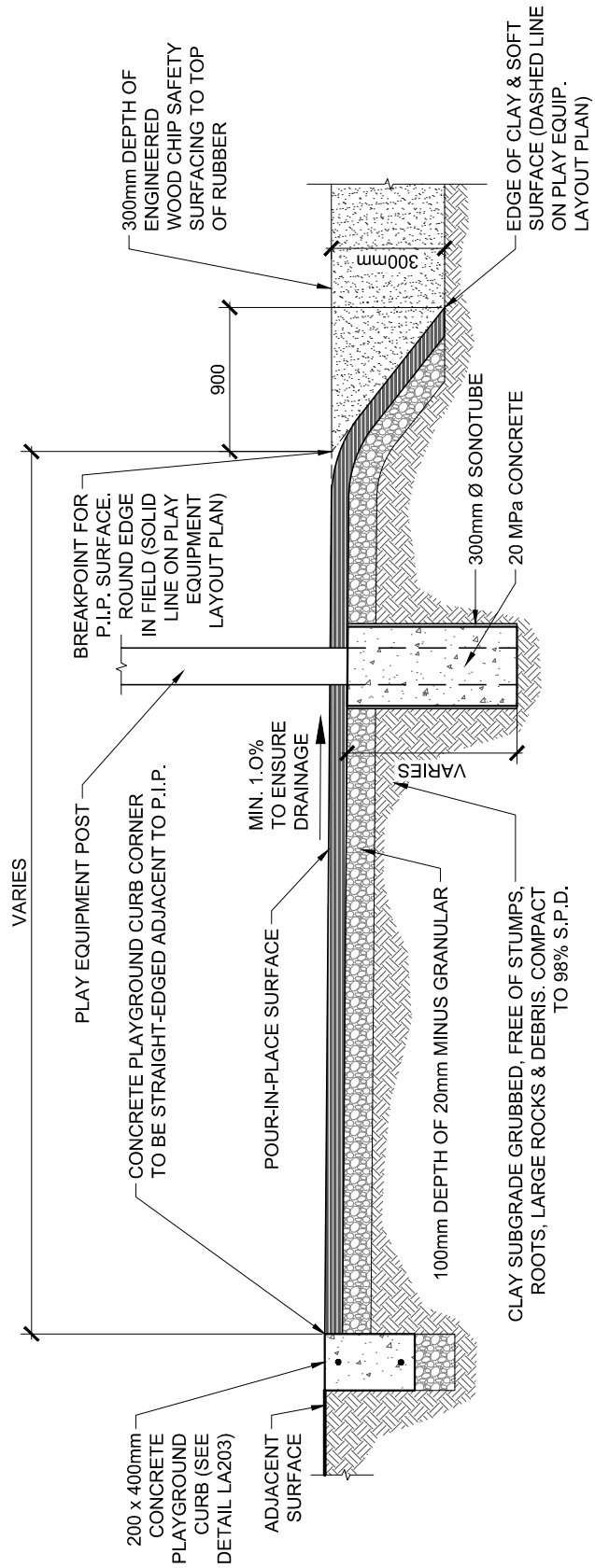
NOTES:

- SPECIFICATIONS: ALL COMPONENTS AND WORKMANSHIP CONFORM TO SPECIFICATION SECTION 02770 CONCRETE CURB/GUTTER/WALK/SLABS AS WELL AS RELATED SECTIONS.
- PLAYGROUND SAFETY SURFACE THAT ARE COMBINATIONS OF WOOD MULCH AND POUR-IN-PLACE RUBBER REQUIRE A 25mm RADIUS ON CURB ADJACENT TO WOOD MULCH SURFACE AND CURB ADJACENT TO POUR-IN-PLACE RUBBER SURFACE IS TO BE SQUARE AND FLUSH.
- 20mm MINUS GRANULAR - SECTION 2060 AGGREGATE DESIGNATION 3, CLASS 20A, COMPACT TO 98% S.P.D.
- DEPTH OF GRANULAR LEVELING COURSE MAY BE ALTERED AT THE DISCRETION OF THE LANDSCAPE ARCHITECT ONLY.



CONCRETE PLAYGROUND CURB ADJACENT WOOD MULCH & POUR-IN-PLACE

Date Approved: SEPT 2013	Drawn By: PARKS PLANNING	Approved: 	Revision	Drawing No. LA203
Scale: N.T.S.	Checked By: PARKS PLANNING			Old Drawing No. -

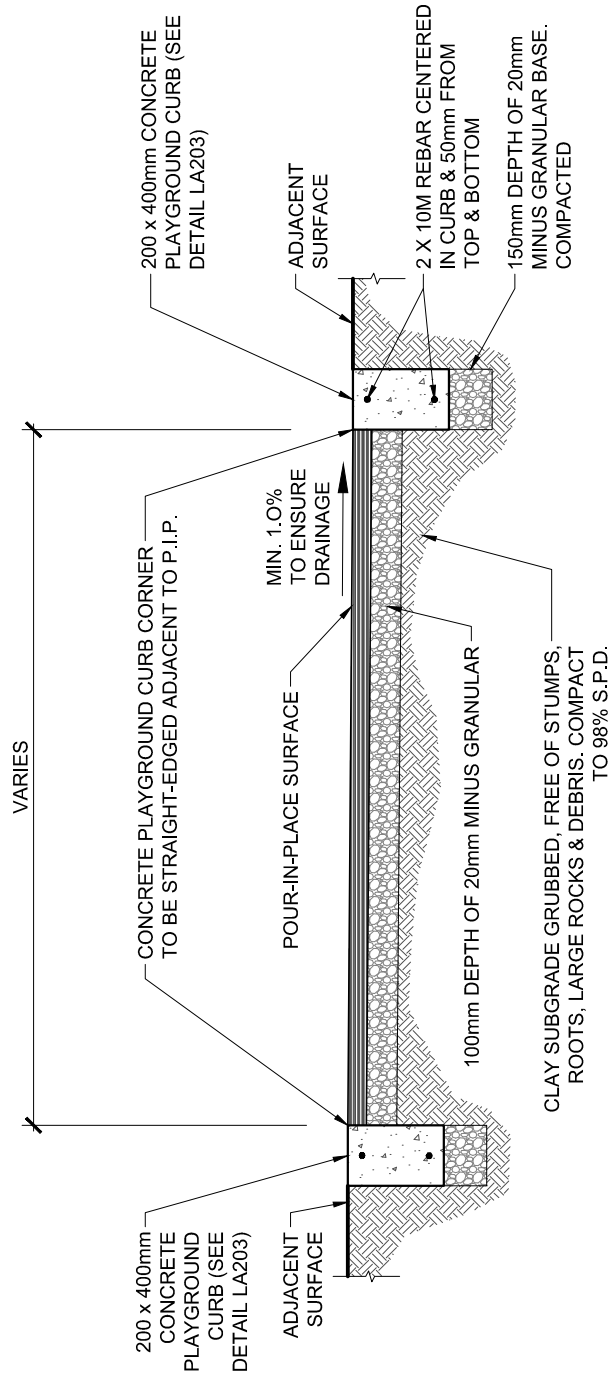


- NOTES:
- SPECIFICATIONS: ALL COMPONENTS AND WORKMANSHIP CONFORM TO SPECIFICATION SECTION 02060
 - AGGREGATE AS WELL AS RELATED SECTIONS.
 - 20mm MINUS GRANULAR - SECTION 2060 AGGREGATE DESIGNATION 3, CLASS 20A, COMPACT TO 98% S.P.D.
 - HOLE DRILLING FOR PLAY EQUIPMENT POSTS BY SUPPLIER.



TYPICAL POUR-IN-PLACE PLAYGROUND SAFETY SURFACE


Date Approved: SEPT 2013	Drawn By: PARKS PLANNING	Approved: 	Revision	Drawing No. LA204
Scale: N.T.S.	Checked By: PARKS PLANNING			Old Drawing No. -

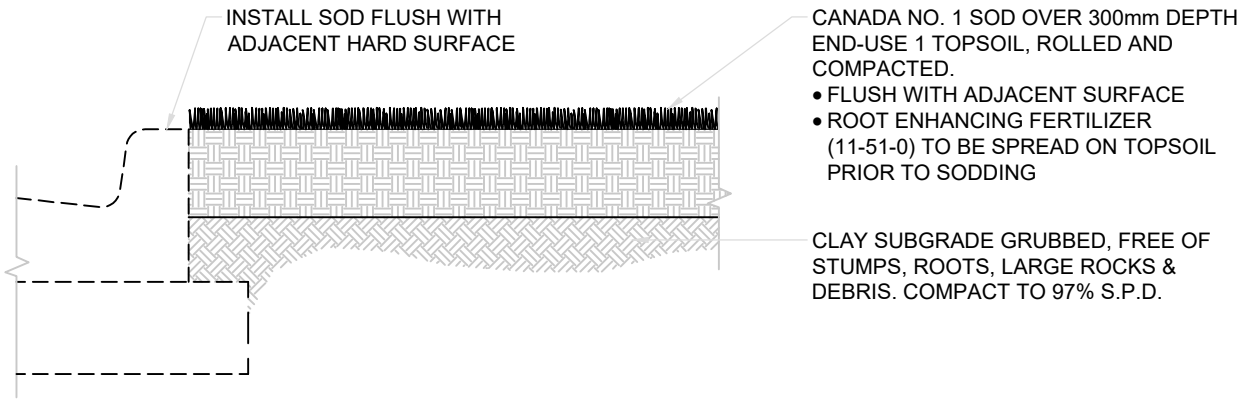


- NOTES:
- SPECIFICATIONS: ALL COMPONENTS AND WORKMANSHIP CONFORM TO SPECIFICATION SECTION 02060 AGGREGATE AS WELL AS RELATED SECTIONS.
 - 20mm MINUS GRANULAR - SECTION 2060 AGGREGATE DESIGNATION 3, CLASS 20A, COMPACT TO 98% S.P.D.

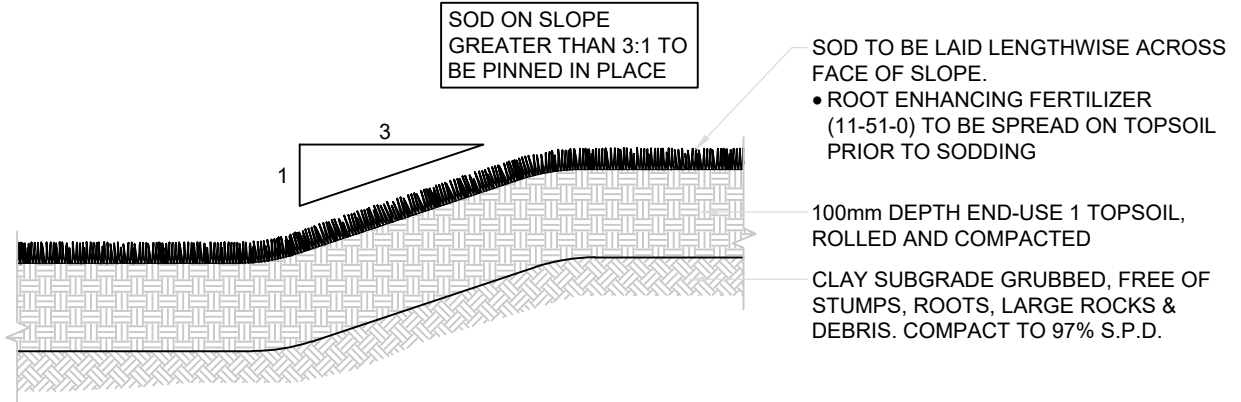


POUR-IN-PLACE PLAYGROUND SAFETY SURFACE - ALL RUBBER

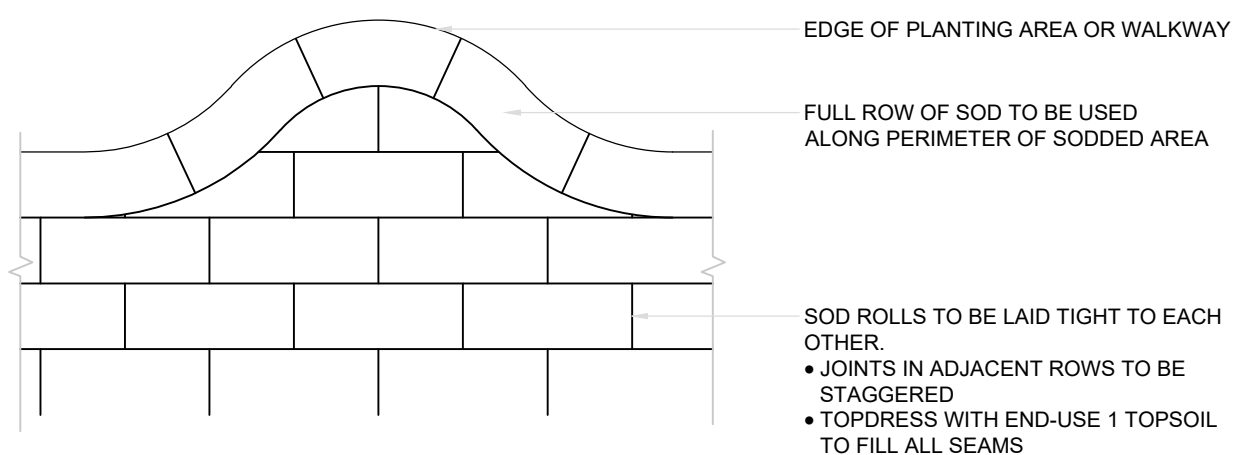
Date Approved: SEPT 2013	Drawn By: PARKS PLANNING	Approved: 	Revision	Drawing No. LA204A
Scale: N.T.S.	Checked By: PARKS PLANNING			Old Drawing No. -



CROSS SECTION



CROSS SECTION THROUGH SLOPE



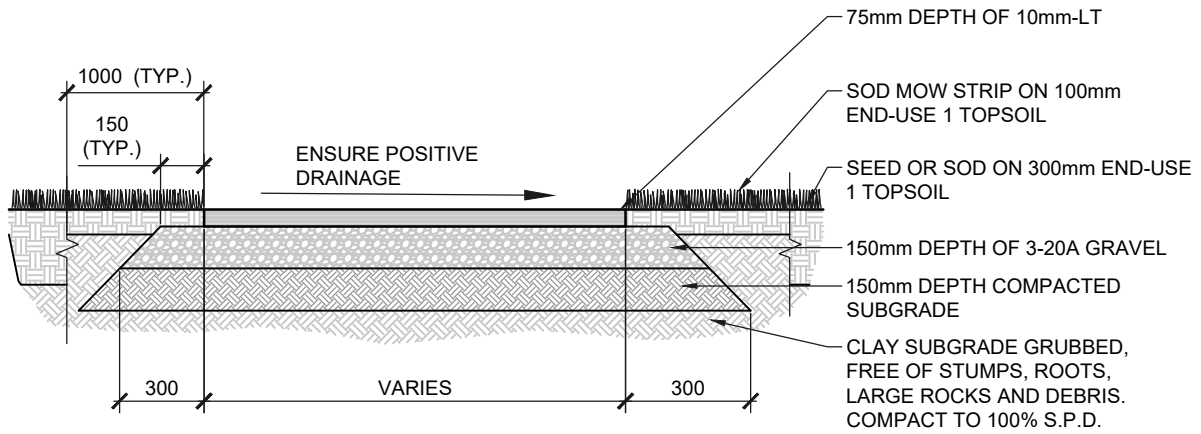
PLAN VIEW

NOTES:

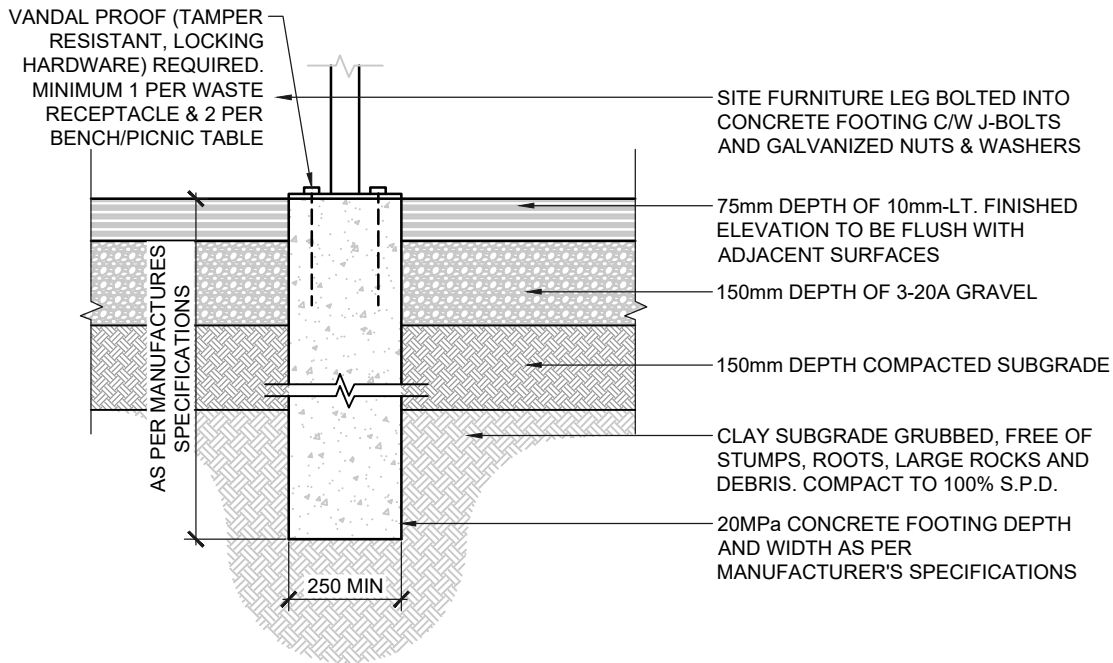
- SPECIFICATIONS: ALL COMPONENTS AND WORKMANSHIP CONFORM TO SPECIFICATION SECTION 02920 SEED AND SOD AS WELL AS THE RELATED SECTIONS.

THE CITY OF **Edmonton** SOD INSTALLATION

Date Approved: FEB 2021	Drawn By: DEDR	Approved:	Revision	Drawing No. LA300
Scale: N.T.S.	Checked By: OPEN SPACE DESIGN			Old Drawing No. SP402



ASPHALT CROSS SECTION (TYP.)



SITE FURNITURE FOOTING WITHIN ASPHALT AREA

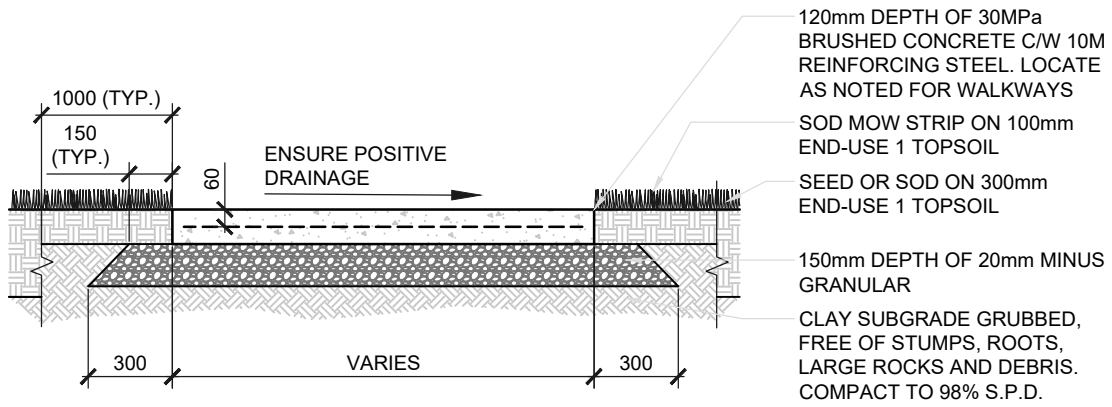
NOTES:

- DIMENSIONS OF ASPHALT WALKWAY OR PLAZA AS PER LANDSCAPE DRAWINGS.
- SET ASPHALT SURFACE FLUSH WITH ADJACENT GRADES.
- ENSURE DRAINAGE OFF ASPHALT AT ALL LOCATIONS & IN COMPLIANCE WITH THE OVERALL SITE DRAINAGE PLAN.
- 20mm MINUS GRANULAR - SECTION 2060 AGGREGATE DESIGNATION 3, CLASS 20A, COMPACT TO 100% S.P.D.
- ALL DIMENSIONS IN MILLIMETERS.

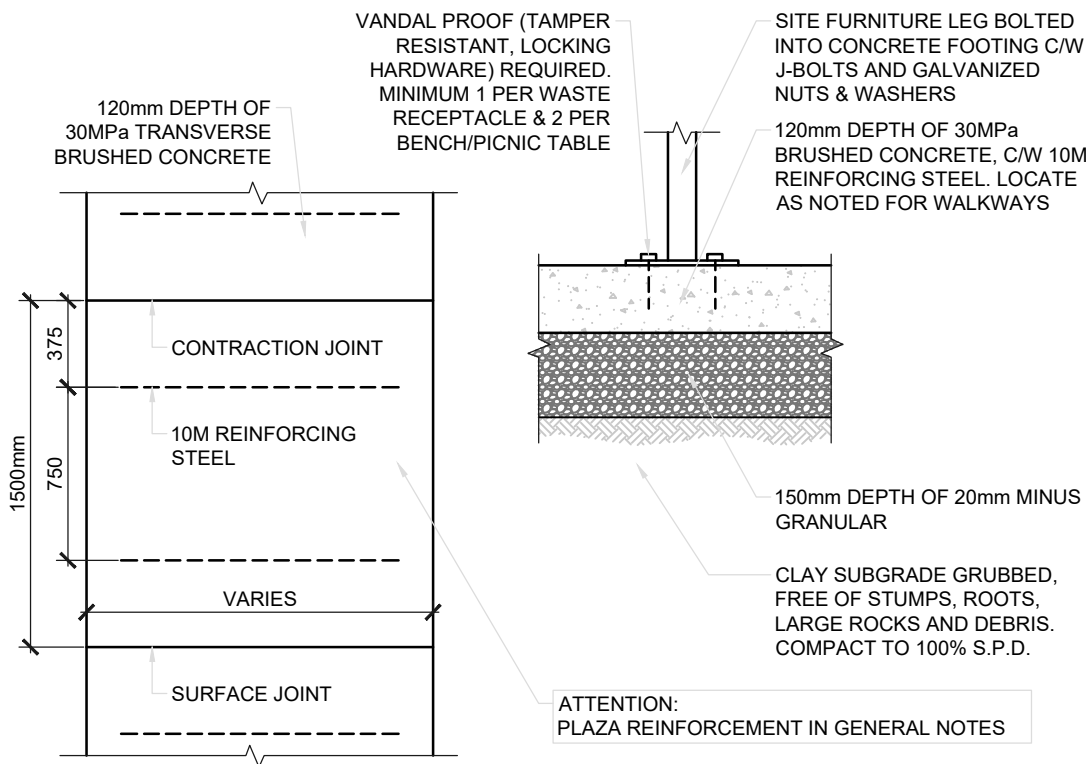


ASPHALT WALKWAY OR PLAZA

Date Approved: FEB 2021	Drawn By: DEDR	Approved:	Revision	Drawing No. LA301
Scale: N.T.S.	Checked By: OPEN SPACE DESIGN			Old Drawing No. -



CONCRETE CROSS SECTION (TYP.)



CONCRETE WALKWAY PLAN VIEW

SITE FURNITURE WITHIN CONCRETE AREA

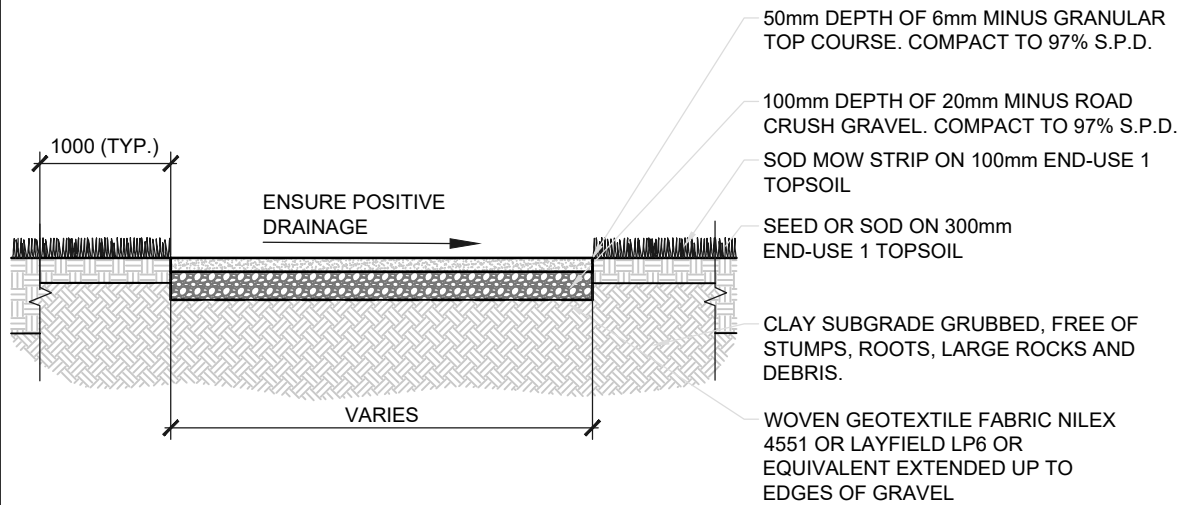
NOTES:

- DIMENSIONS/DEFINITION: A CONCRETE WALKWAY HAS A WIDTH OF 1500-2400mm AND A PLAZA IS GREATER IN WIDTH THAN 2400mm.
- FOR PLAZA AREAS INSTALL WELDED STEEL WIRE FABRIC AS PER TRANSPORTATION REQUIREMENTS. INSTALL CONTRACTION JOINTS AS PER LAYOUT DETAIL ON LANDSCAPE DRAWINGS.
- SET CONCRETE SURFACE FLUSH WITH ADJACENT GRADES.
- ENSURE DRAINAGE OFF CONCRETE AT ALL LOCATIONS & IN COMPLIANCE WITH THE OVERALL SITE DRAINAGE PLAN.
- 20mm MINUS GRANULAR - SECTION 2060 AGGREGATE DESIGNATION 3, CLASS 20A, COMPACT TO 100% S.P.D.

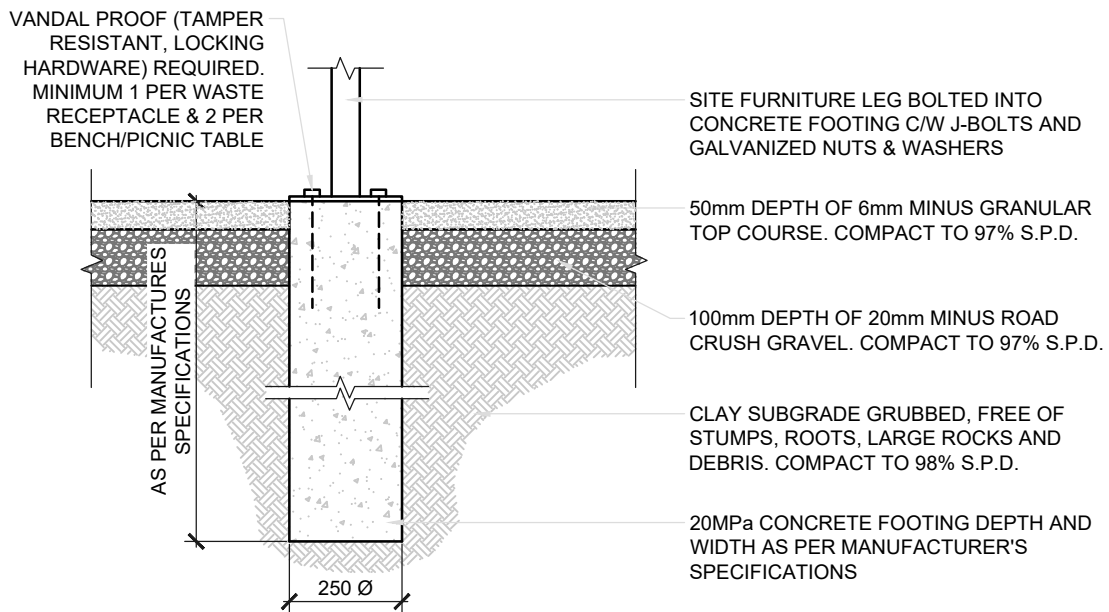


CONCRETE WALKWAY OR PLAZA

Date Approved: FEB 2021	Drawn By: DEDR	Approved:	Revision	Drawing No. LA302
Scale: N.T.S.	Checked By: OPEN SPACE DESIGN			Old Drawing No. -



GRANULAR CROSS SECTION (TYP.)



SITE FURNITURE FOOTING WITHIN GRANULAR AREA

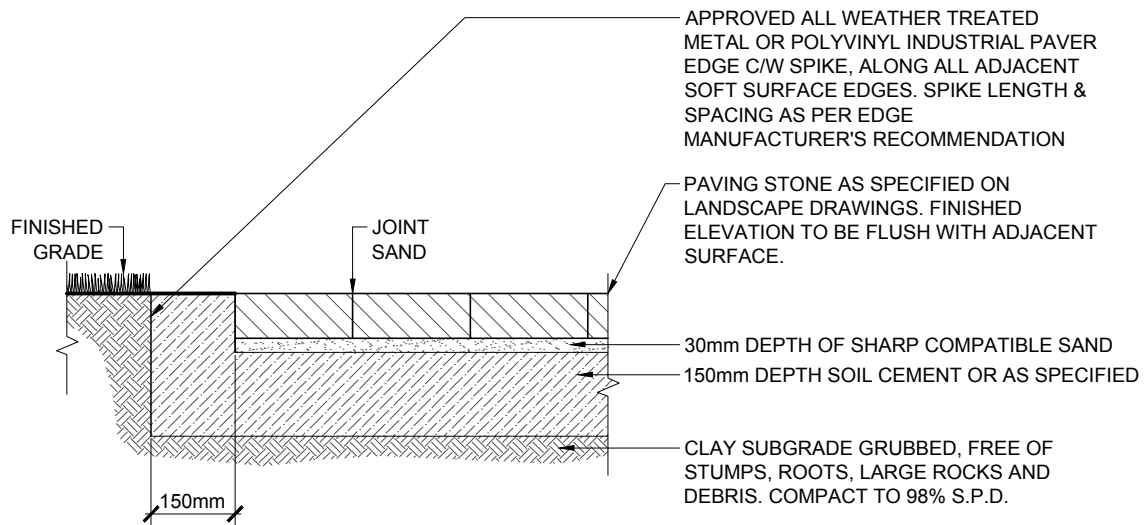
NOTES:

- DIMENSIONS OF GRANULAR WALKWAY OR PLAZA AS PER LANDSCAPE DRAWINGS.
- SET GRANULAR SURFACE FLUSH WITH ADJACENT GRADES.
- ENSURE DRAINAGE OFF GRANULAR AT ALL LOCATIONS & IN COMPLIANCE WITH THE OVERALL SITE DRAINAGE PLAN.
- 20mm MINUS GRANULAR - SECTION 2060 AGGREGATE DESIGNATION 3, CLASS 20A, COMPACT TO 97% S.P.D.

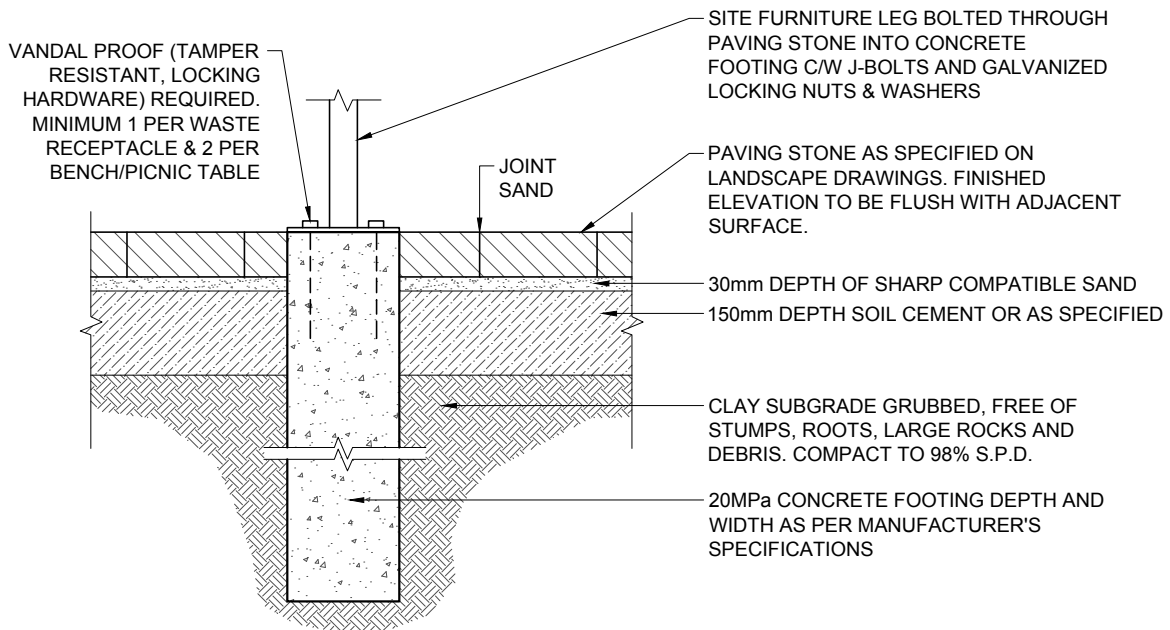


GRANULAR WALKWAY

Date Approved: FEB 2021	Drawn By: DEDR	Approved:	Revision	Drawing No. LA303
Scale: N.T.S.	Checked By: OPEN SPACE DESIGN			Old Drawing No. -



PAVING STONE CROSS SECTION (TYP.)




SITE FURNITURE FOOTING WITHIN PAVING STONE AREA

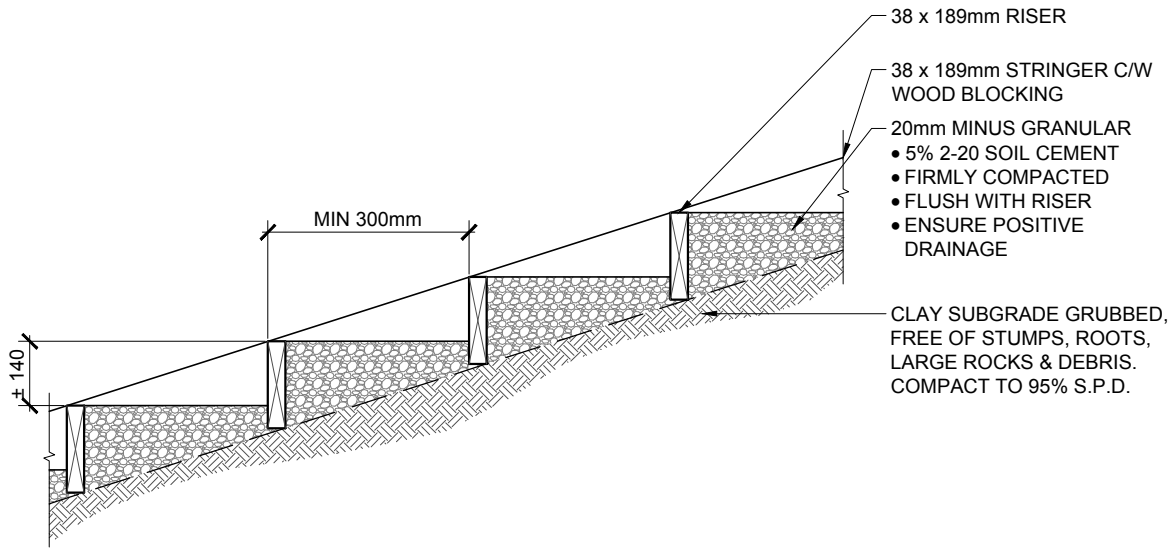
NOTES:

- DIMENSIONS OF PAVING STONE WALKWAY OR PLAZA AS PER LANDSCAPE DRAWINGS.
- SET PAVING STONE SURFACE FLUSH WITH ADJACENT GRADES.
- ENSURE DRAINAGE OFF PAVING STONE AT ALL LOCATIONS & IN COMPLIANCE WITH THE OVERALL SITE DRAINAGE PLAN.

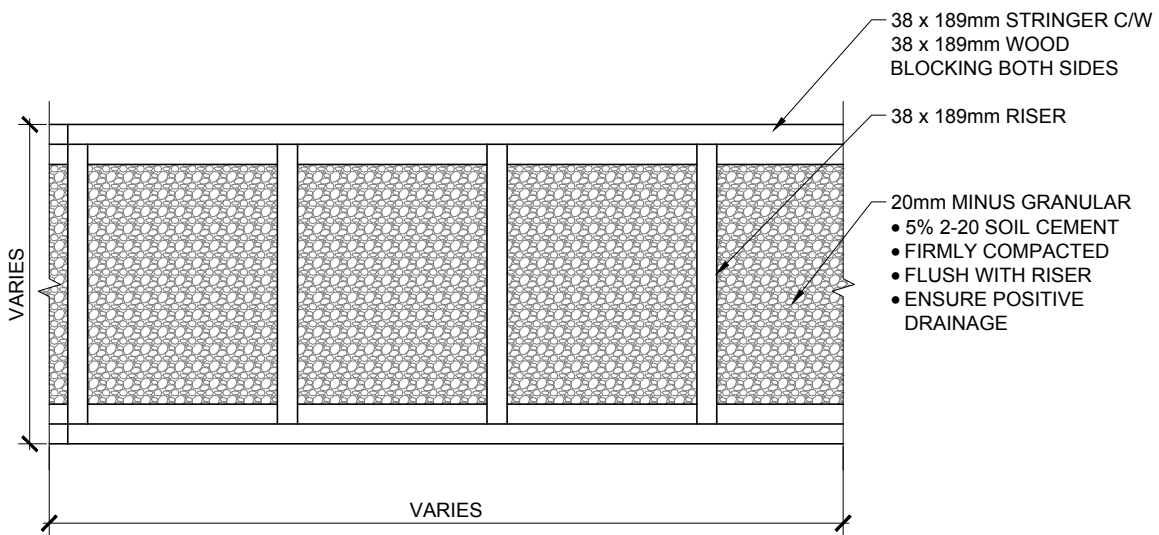


PAVING STONE WALKWAY OR PLAZA

Date Approved: SEPT 2013	Drawn By: PARKS PLANNING	Approved: 	Revision	Drawing No. LA304
Scale: N.T.S.	Checked By: PARKS PLANNING			Old Drawing No. -



GRAVEL PLANK STEPS CROSS SECTION




PLAN VIEW

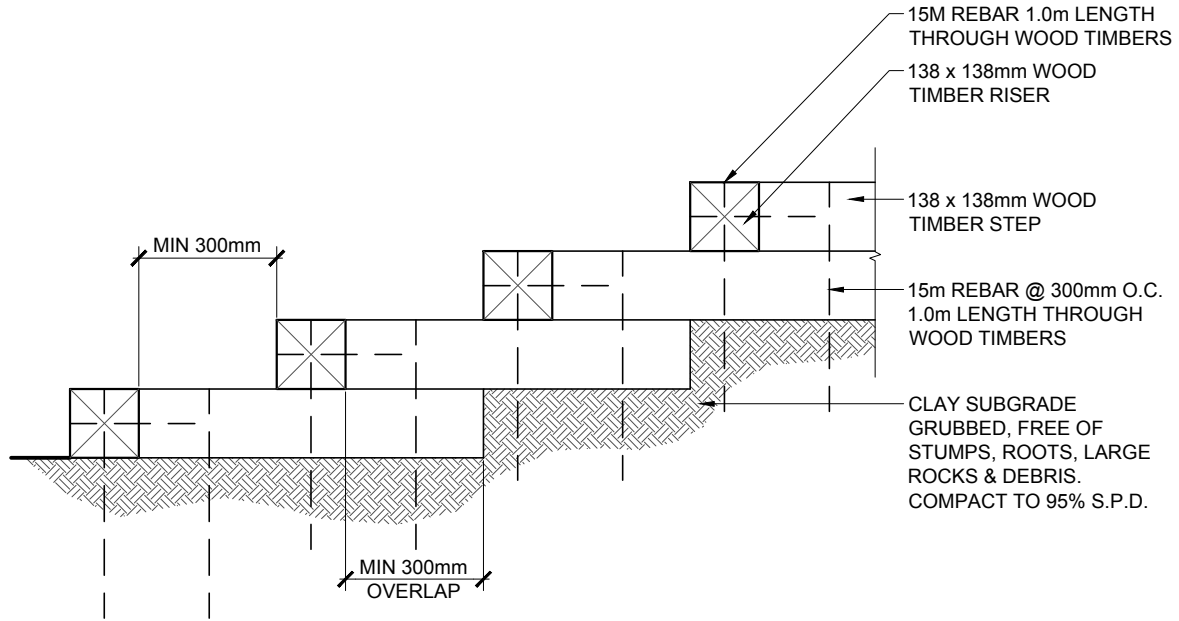
NOTES:

- ALL WOOD TO BE PRESSURE TREATED ACQ EXCEPT IN PLAYGROUND AREAS. USE CEDAR OR APPROVED ALTERNATIVE.
- DIMENSIONS OF GRAVEL PLANK STEPS AS PER LANDSCAPE DRAWINGS.
- SET GRANULAR SURFACE FLUSH WITH ADJACENT GRADES.
- ENSURE DRAINAGE OFF STEPS AT ALL LOCATIONS & IN COMPLIANCE WITH THE OVERALL SITE DRAINAGE PLAN.
- 20mm MINUS GRANULAR - SECTION 2060 AGGREGATE DESIGNATION 3, CLASS 20A, COMPACT TO 100% S.P.D.

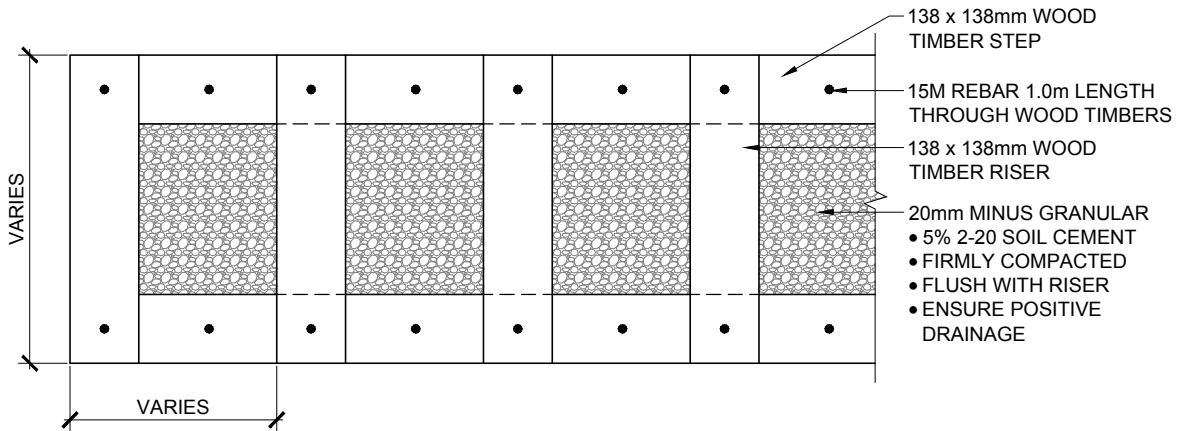


GRAVEL PLANK STEPS

Date Approved: SEPT 2013	Drawn By: PARKS PLANNING	Approved: 	Revision	Drawing No. LA305
Scale: N.T.S.	Checked By: PARKS PLANNING			Old Drawing No. -



GRAVEL TIMBER STEPS CROSS SECTION



PLAN VIEW

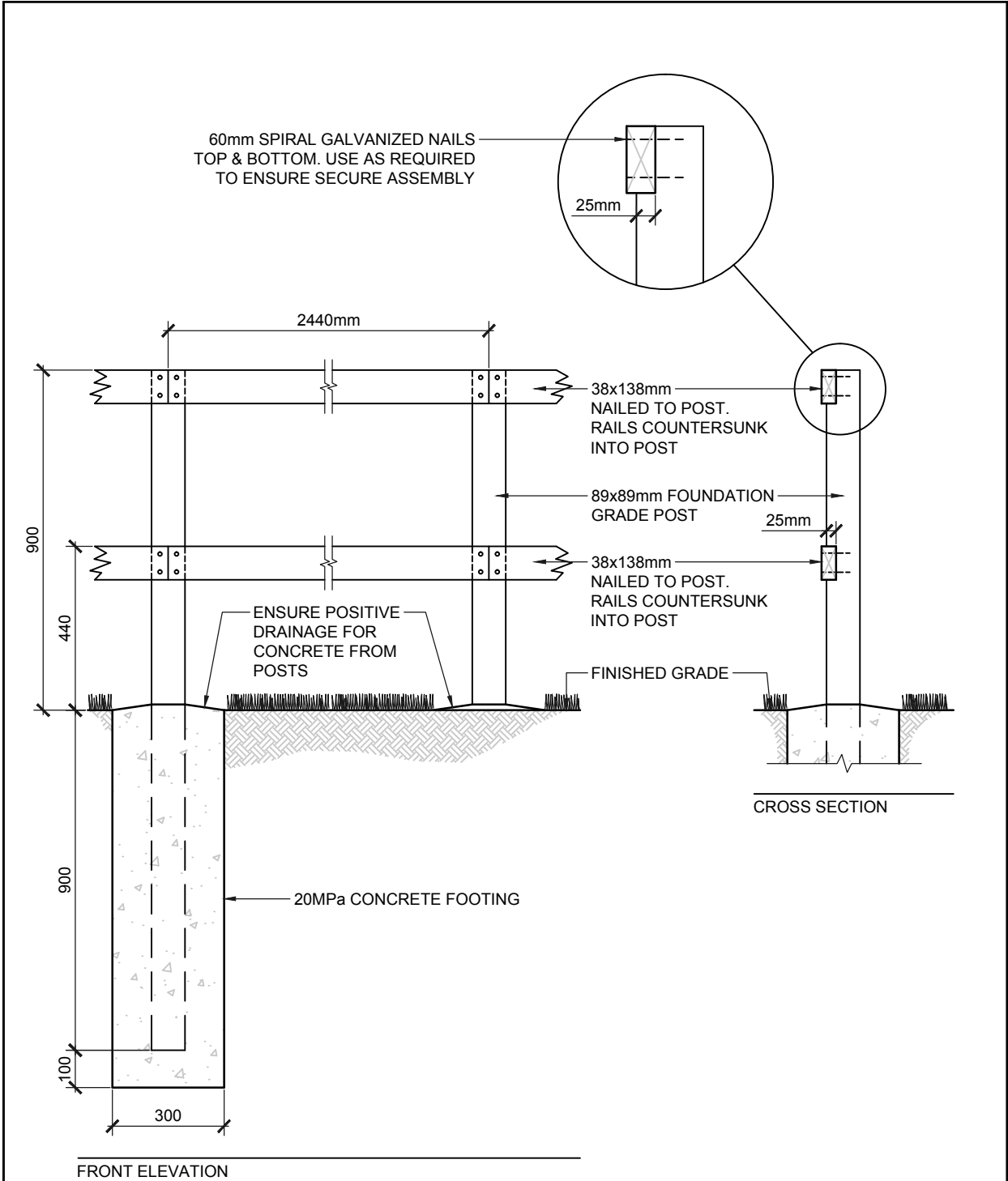
NOTES:

- ALL WOOD TO BE PRESSURE TREATED ACQ EXCEPT IN PLAYGROUND AREAS. USE CEDAR OR APPROVED ALTERNATIVE.
- DIMENSIONS OF GRAVEL TIMBER STEPS AS PER LANDSCAPE DRAWINGS.
- SET GRANULAR SURFACE FLUSH WITH ADJACENT GRADES.
- ENSURE DRAINAGE OFF STEPS AT ALL LOCATIONS & IN COMPLIANCE WITH THE OVERALL SITE DRAINAGE PLAN.
- 20mm MINUS GRANULAR - SECTION 2060 AGGREGATE DESIGNATION 3, CLASS 20A, COMPACT TO 100% S.P.D.



GRAVEL TIMBER STEPS

Date Approved: SEPT 2013	Drawn By: PARKS PLANNING	Approved: 	Revision	Drawing No. LA306
Scale: N.T.S.	Checked By: PARKS PLANNING			Old Drawing No. -



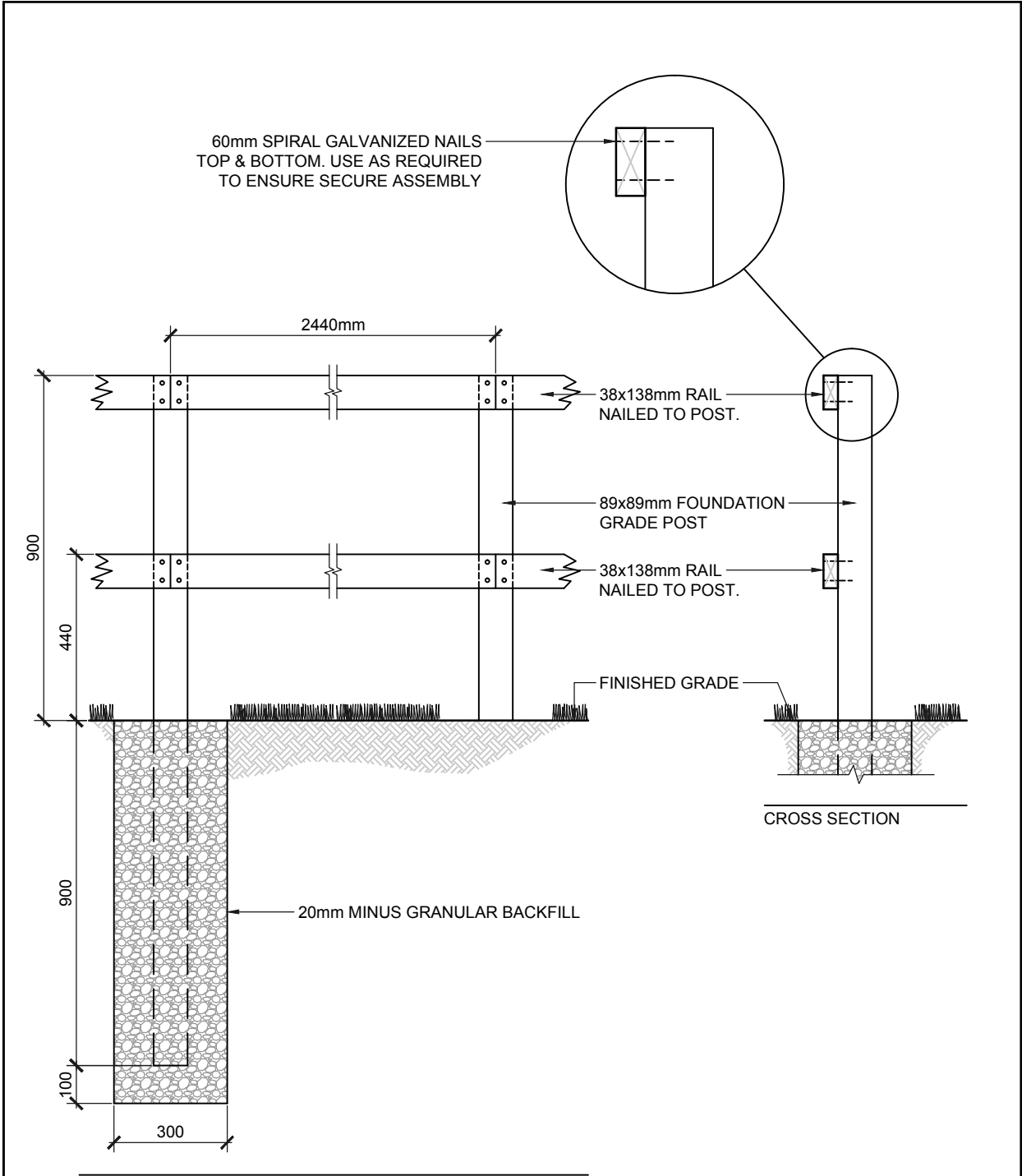
NOTES:

- ALL POSTS TO BE PRESSURE TREATED ACQ.
- ALL NAILS TO BE 60mm LENGTH SPIRAL GALVANIZED. USE AS REQUIRED TO ENSURE SECURE ASSEMBLY.
- WOOD USED MAY BE LODGEPOLE PINE, FIRE, HEMLOCK OR SPRUCE, DEPENDANT ON AVAILABILITY AT TIME OF CONSTRUCTION.
- ALL WOOD CUTS TO BE COATED WITH TWO COATS OF APPROVED WOOD PRESERVATIVE.
- ALL DIMENSIONS IN MILLIMETERS.



PERMANENT WOOD RAIL FENCE

Date Approved: JUNE 2015	Drawn By: PARKS PLANNING	Approved: <i>Frank Gasparik</i>	Revision	Drawing No. LA400
Scale: N.T.S.	Checked By: PARKS PLANNING			Old Drawing No. -



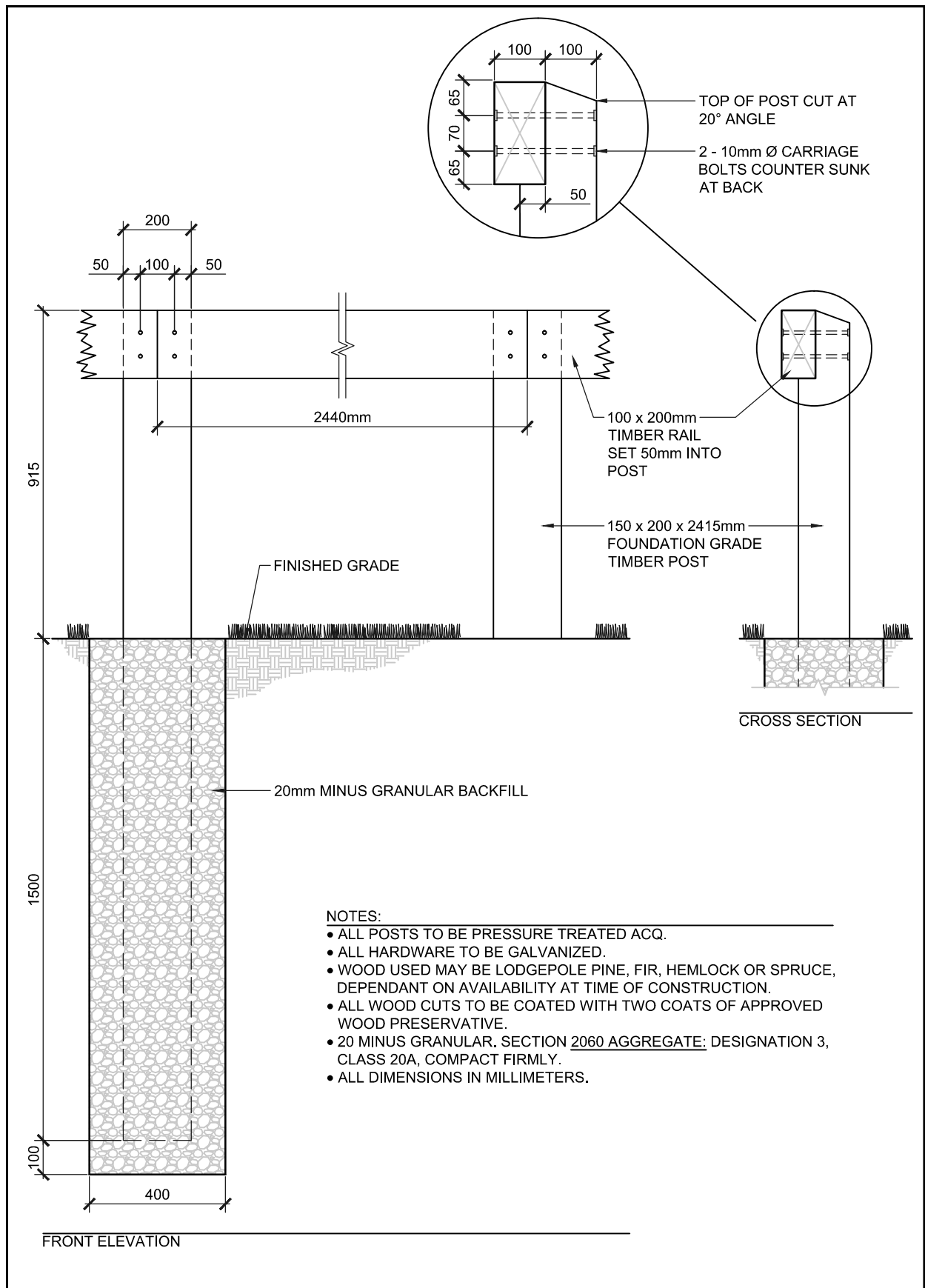
NOTES:

- ALL NAILS TO BE 60mm SPIRAL GALVANIZED. USE AS REQUIRED TO ENSURE SECURE ASSEMBLY.
- WOOD USED MAY BE LODGEPOLE PINE, FIRE, HEMLOCK OR SPRUCE, DEPENDANT ON AVAILABILITY AT TIME OF CONSTRUCTION.
- 20mm MINUS GRANULAR - SECTION 2060 AGGREGATE DESIGNATION 3, CLASS 20A, COMPACT FIRMLY.
- ALL DIMENSIONS IN MILLIMETERS.



TEMPORARY WOOD RAIL FENCE

Date Approved: JUNE 2015	Drawn By: PARKS PLANNING	Approved: <i>Frank Gasparik</i>	Revision	Drawing No. LA401
Scale: N.T.S.	Checked By: PARKS PLANNING			Old Drawing No. -



915mm HIGH WOOD GUARD RAIL

Date Approved:
JUNE 2015

Drawn By:
PARKS
PLANNING

Approved:

Frank Gasparik

Revision

Drawing No.

LA402

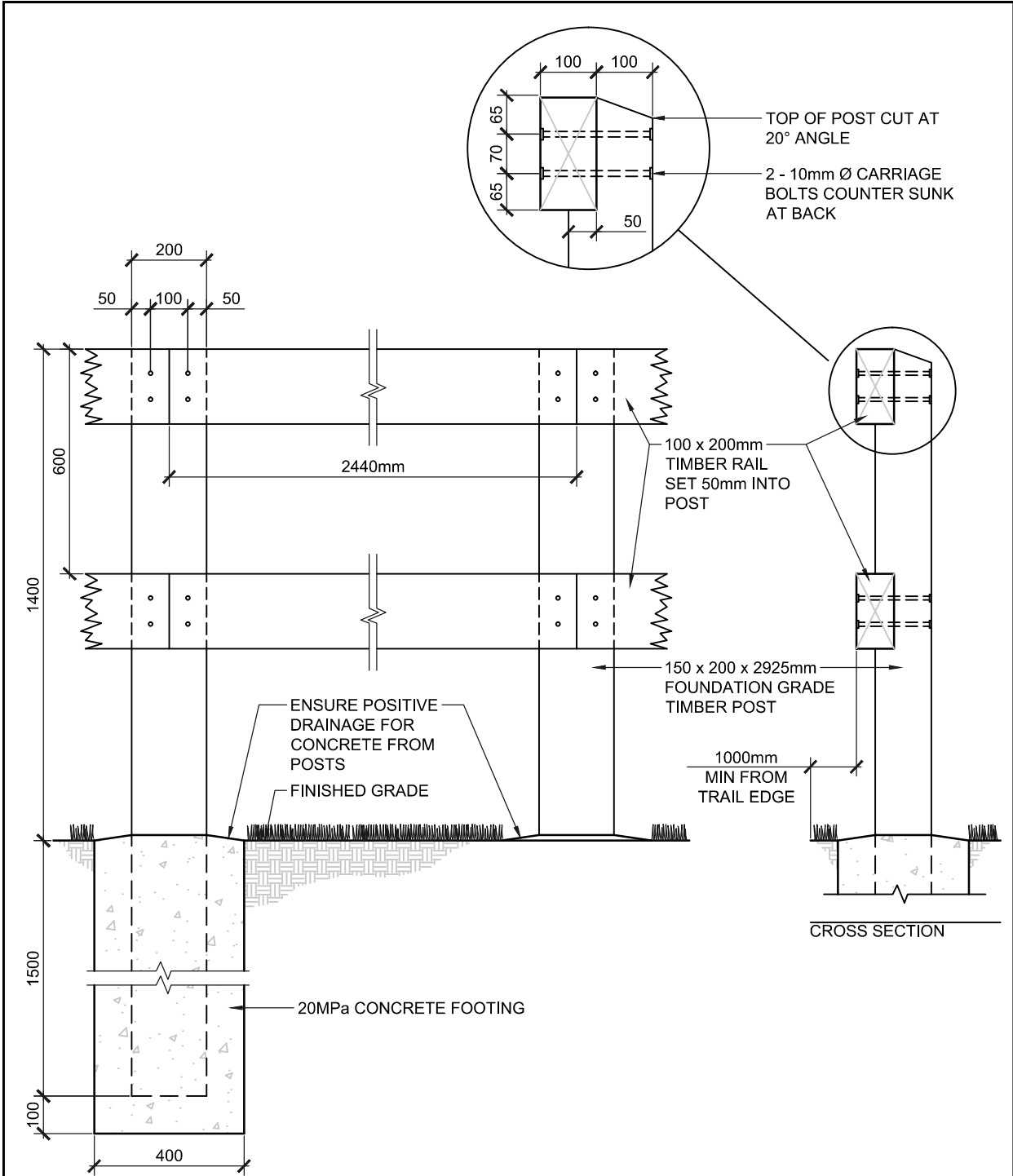
Scale:

N.T.S.

Checked By:
PARKS
PLANNING

Old Drawing No.

SP300d

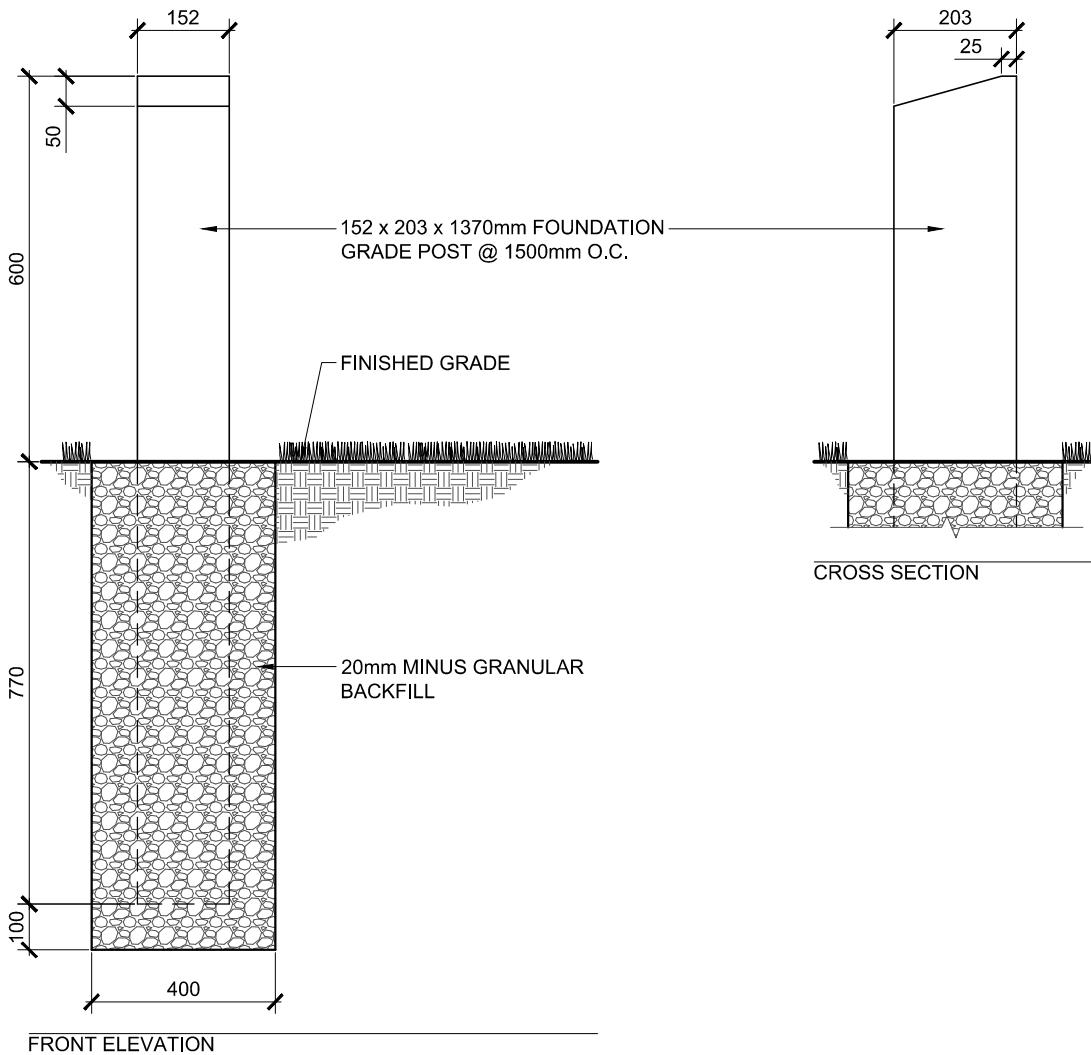


FRONT ELEVATION

- NOTES:**
- ALL POSTS TO BE PRESSURE TREATED ACQ.
 - ALL HARDWARE TO BE GALVANIZED.
 - WOOD USED MAY BE LODGEPOLE PINE, FIR, HEMLOCK OR SPRUCE, DEPENDANT ON AVAILABILITY AT TIME OF CONSTRUCTION.
 - ALL POST CUTS TO BE COATED WITH TWO COATS OF APPROVED WOOD PRESERVATIVE.
 - ALL DIMENSIONS IN MILLIMETERS.

THE CITY OF Edmonton 1400mm HIGH WOOD GUARD RAIL

Date Approved: JUNE 2015	Drawn By: PARKS PLANNING	Approved: <i>Frank Gasparik</i>	Revision	Drawing No. LA403
Scale: N.T.S.	Checked By: PARKS PLANNING			Old Drawing No. SP300i




NOTES:

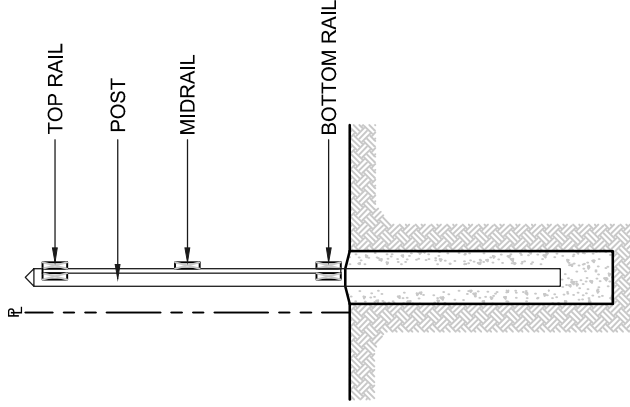
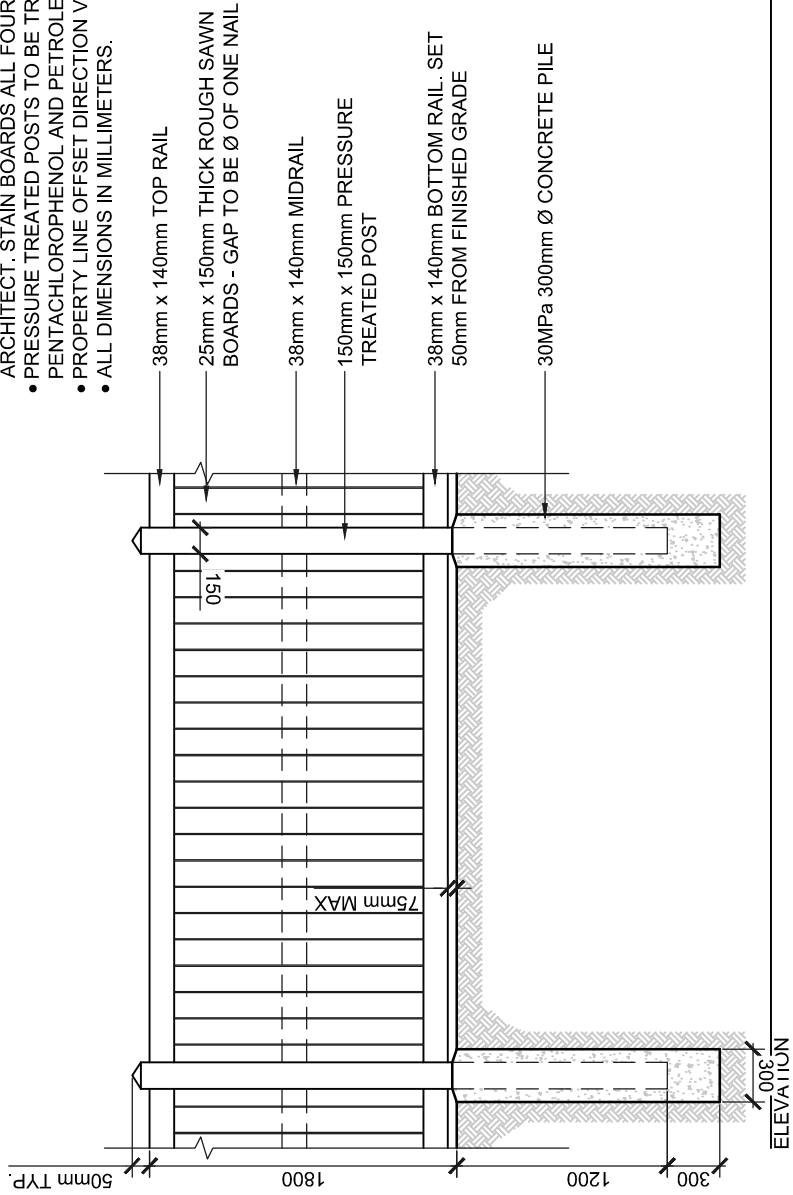
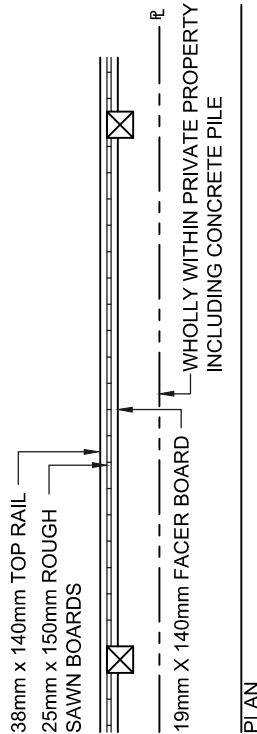
- ALL WOOD TO BE PRESSURE TREATED ACQ.
- WOOD USED MAY BE LODGEPOLE PINE, FIR, HEMLOCK OR SPRUCE, DEPENDANT ON AVAILABILITY AT TIME OF CONSTRUCTION.
- ALL WOOD CUTS TO BE COATED WITH TWO COATS OF APPROVED WOOD PRESERVATIVE.
- 20 MINUS GRANULAR. SECTION 2060 AGGREGATE: DESIGNATION 3, CLASS 20A, COMPACT FIRMLY.



152 x 203mm WOOD BUMPER POST

Date Approved: SEPT 2013	Drawn By: PARKS PLANNING	Approved: 	Revision	Drawing No. LA404
Scale: N.T.S.	Checked By: PARKS PLANNING			Old Drawing No. SP300g

- NOTES:**
- FENCES INCLUDING THE CONCRETE PILE MUST BE CONSTRUCTED WHOLLY WITHIN PRIVATE PROPERTY.
 - FENCES ON PRIVATE PROPERTY SHALL REQUIRE A MINIMUM OF PRESSURE TREATED POSTS AND BOTTOM RAILS. FENCES ON CITY PROPERTY SHALL REQUIRE ALL WOOD MEMBERS TO BE PRESSURE TREATED OR APPROVED EQUAL. ALL WOOD MEMBERS ABOVE GROUND TO BE NON-INCISED.
 - ALL NAILS TO BE 60mm SPIRAL GALVANIZED. USE AS REQUIRED TO ENSURE SECURE ASSEMBLY.
 - WOOD USED MAY BE LODGEPOLE PINE, FIR, HEMLOCK OR SPRUCE, DEPENDANT ON AVAILABILITY AT TIME OF CONSTRUCTION.
 - ALL STAIN TO BE AS PER LANDSCAPE ARCHITECT. APPLY 2 COATS AS PER MANUFACTURERS SPECIFICATIONS. COLOUR TO BE DETERMINED BY LANDSCAPE ARCHITECT. STAIN BOARDS ALL FOUR SIDES PRIOR TO CONSTRUCTION.
 - PRESSURE TREATED POSTS TO BE TREATED WITH A SOLUTION OF PENTACHLOROPHENOL AND PETROLEUM TO CSA-080.
 - PROPERTY LINE OFFSET DIRECTION VARIES. REFER TO PLAN.
 - ALL DIMENSIONS IN MILLIMETERS.



1800mm HEIGHT WOOD SCREEN FENCE

Date Approved:
JUNE 2017

Drawn By:
PARKS
PLANNING

Approved:

Revision

Drawing No.

LA405

Scale:

N.T.S.

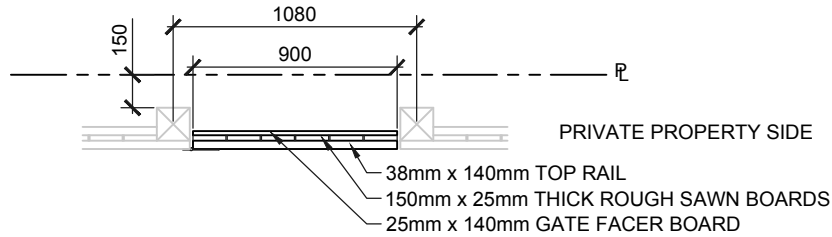
Checked By:
PARKS
PLANNING

Old Drawing No.

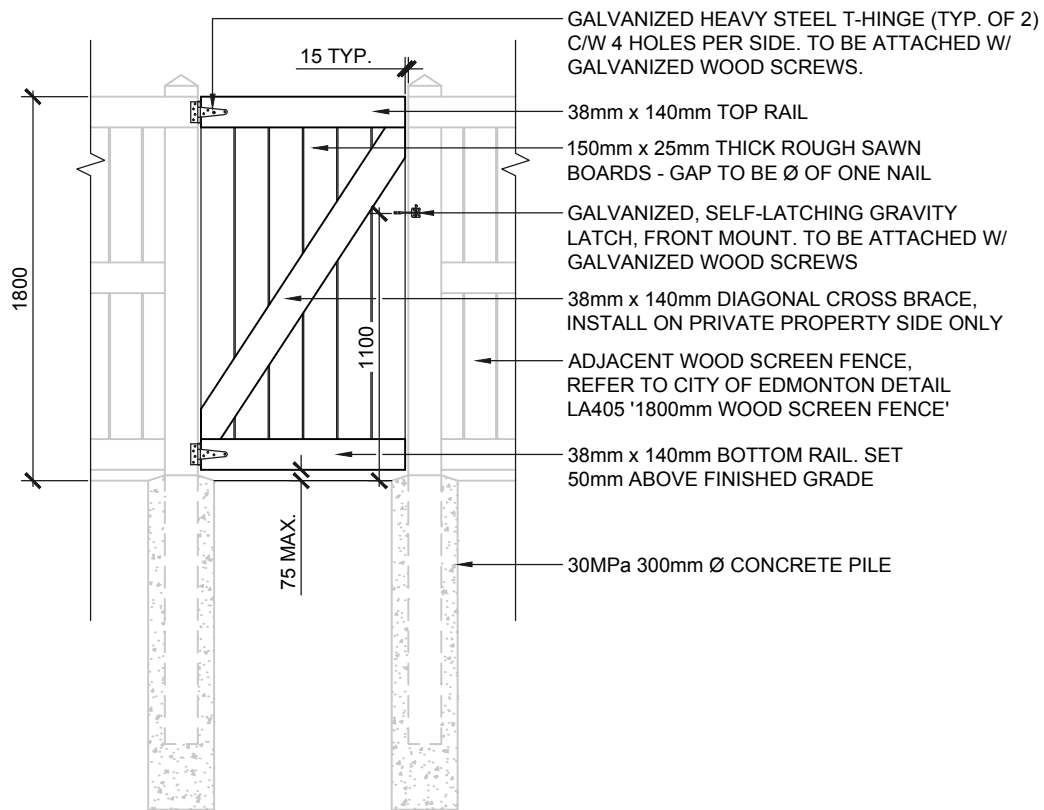
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NOTES:

- FENCES ON PRIVATE PROPERTY SHALL REQUIRE A MINIMUM OF PRESSURE TREATED POSTS AND BOTTOM RAILS. FENCES ON CITY PROPERTY SHALL REQUIRE ALL WOOD MEMBERS TO BE PRESSURE TREATED OR APPROVED EQUAL. ALL WOOD MEMBERS ABOVE GROUND TO BE NON-INCISED.
- ALL NAILS TO BE 60mm SPIRAL GALVANIZED. USE AS REQUIRED TO ENSURE SECURE ASSEMBLY. ALL HARDWARE TO BE GALVANIZED.
- WOOD USED MAY BE LODGEPOLE PINE, FIR, HEMLOCK OR SPRUCE, DEPENDANT ON AVAILABILITY AT TIME OF CONSTRUCTION.
- APPLY 2 COATS OF STAIN AS PER MANUFACTURERS SPECIFICATIONS. COLOUR TO BE DETERMINED BY LANDSCAPE ARCHITECT. STAIN BOARDS ALL FOUR SIDES PRIOR TO CONSTRUCTION.
- PROPERTY LINE OFFSET DIRECTION VARIES. REFER TO PLAN.
- ALL DIMENSIONS IN MILLIMETERS.
- GATE TO SWING INTO PRIVATE PROPERTY UNLESS OTHERWISE SPECIFIED.



PLAN



ELEVATION

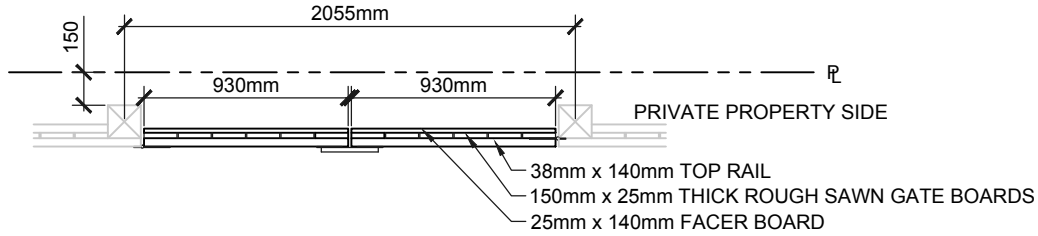


1800mm WOOD FENCE GATE - SINGLE

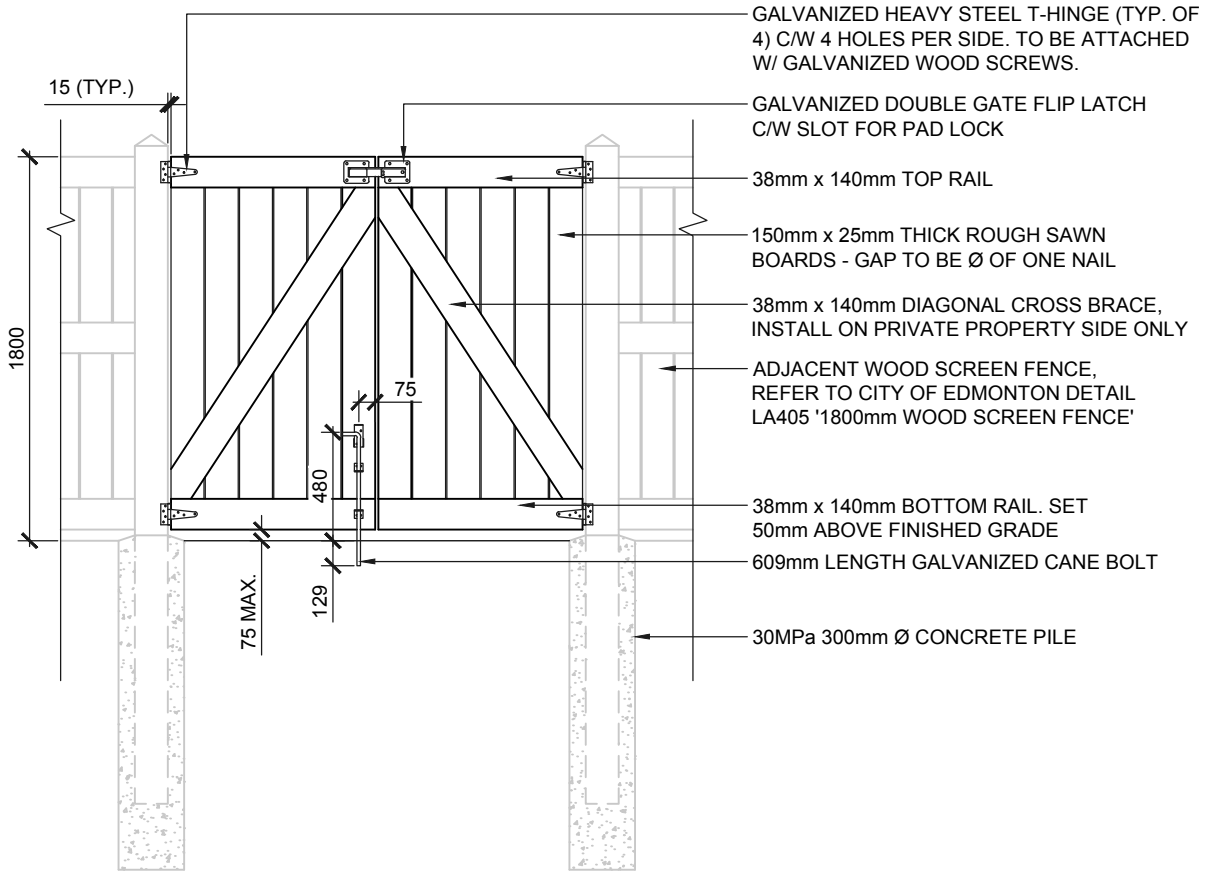
Date Approved: JUNE 2015	Drawn By: PARKS PLANNING	Approved: <i>Frank Gasparik</i>	Revision	Drawing No. LA405A
Scale: N.T.S.	Checked By: PARKS PLANNING			Old Drawing No. N/A

NOTES:

- FENCES ON PRIVATE PROPERTY SHALL REQUIRE A MINIMUM OF PRESSURE TREATED POSTS AND BOTTOM RAILS. FENCES ON CITY PROPERTY SHALL REQUIRE ALL WOOD MEMBERS TO BE PRESSURE TREATED OR APPROVED EQUAL. ALL WOOD MEMBERS ABOVE GROUND TO BE NON-INCISED.
- ALL NAILS TO BE 60mm SPIRAL GALVANIZED. USE AS REQUIRED TO ENSURE SECURE ASSEMBLY. ALL HARDWARE TO BE GALVANIZED.
- WOOD USED MAY BE LODGEPOLE PINE, FIR, HEMLOCK OR SPRUCE, DEPENDANT ON AVAILABILITY AT TIME OF CONSTRUCTION.
- APPLY 2 COATS OF STAIN AS PER MANUFACTURERS SPECIFICATIONS. COLOUR TO BE DETERMINED BY LANDSCAPE ARCHITECT. STAIN BOARDS ALL FOUR SIDES PRIOR TO CONSTRUCTION.
- PROPERTY LINE OFFSET DIRECTION VARIES. REFER TO PLAN.
- ALL DIMENSIONS IN MILLIMETERS.
- GATE TO SWING INTO PRIVATE PROPERTY UNLESS OTHERWISE SPECIFIED.



PLAN

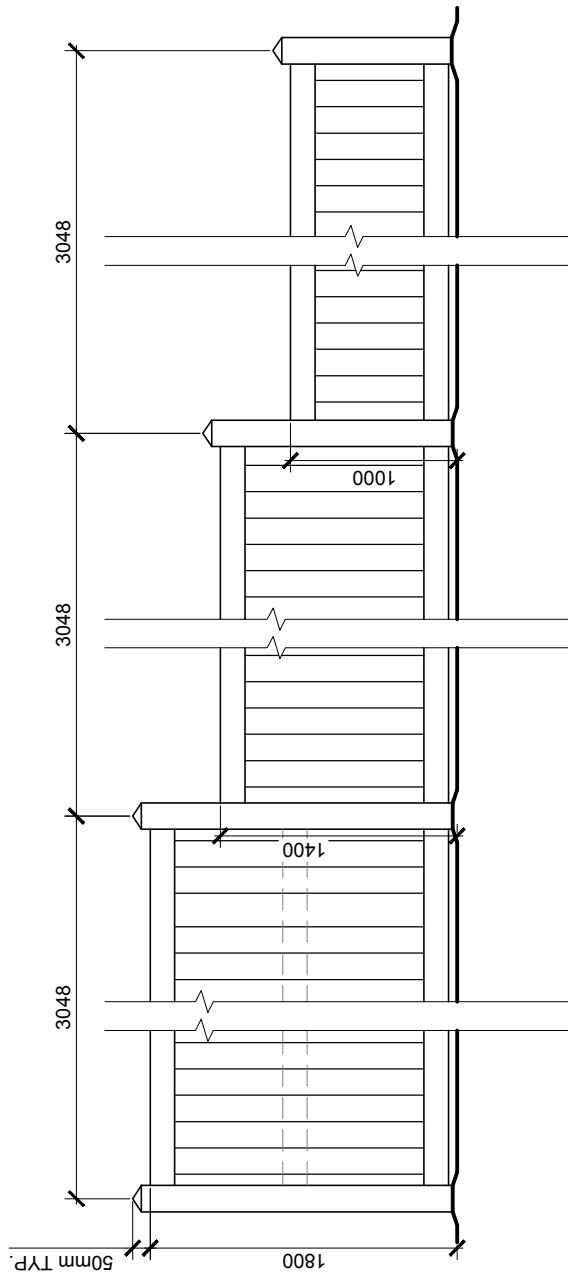


ELEVATION



1800mm HEIGHT WOOD FENCE GATE - DOUBLE

Date Approved: JUNE 2015	Drawn By: PARKS PLANNING	Approved: <i>Frank Gasparik</i>	Revision	Drawing No. LA405B
Scale: N.T.S.	Checked By: PARKS PLANNING			Old Drawing No. N/A




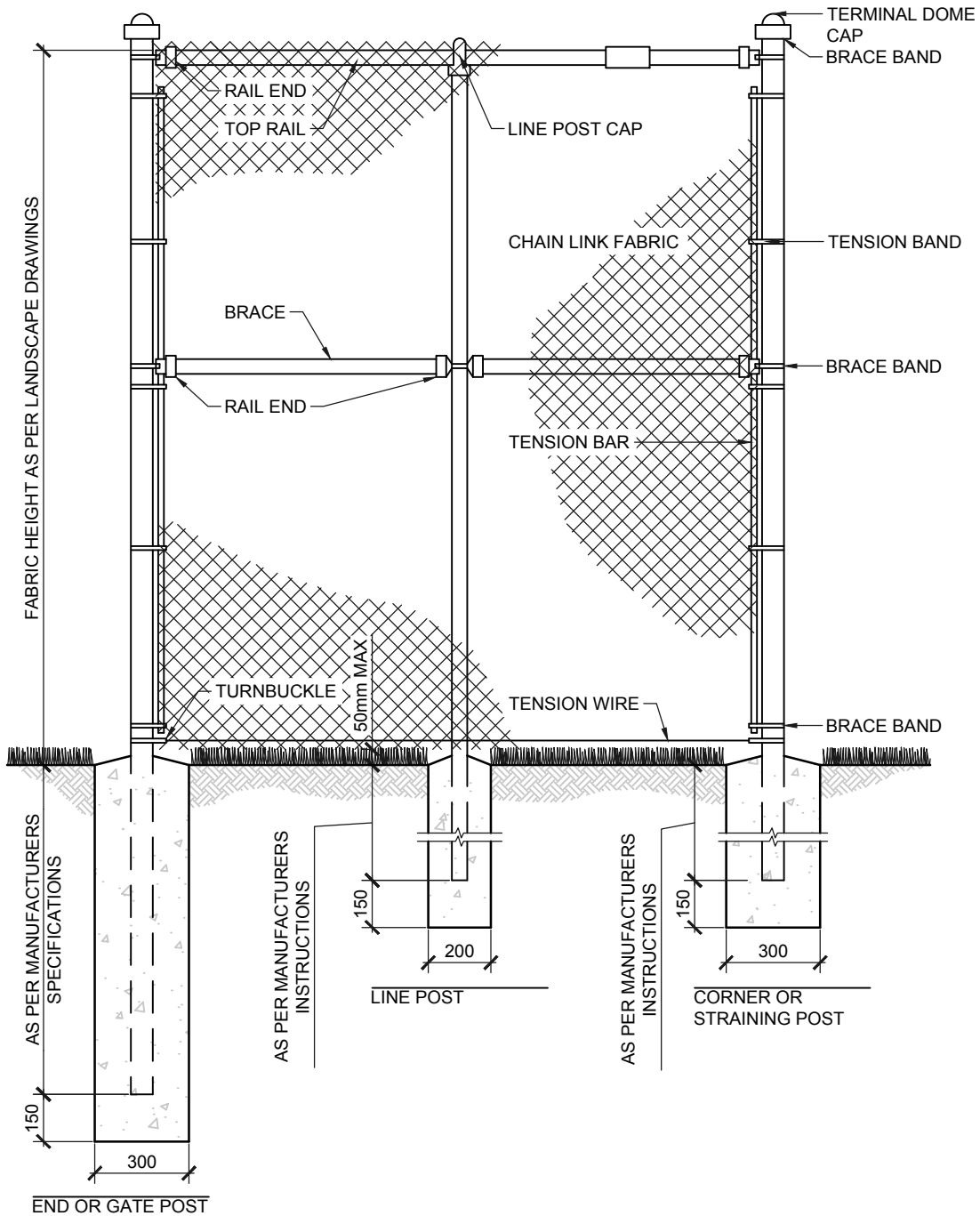
ELEVATION

- NOTES:
- REFER TO CONSTRUCTION DETAIL LA405 FOR ALL METHODS AND MATERIALS REGARDING CONSTRUCTION OF WOOD SCREEN FENCING.



WOOD SCREEN FENCE STEPDOWN

Date Approved: SEPT 2013	Drawn By: PARKS PLANNING	Approved: 	Revision	Drawing No. LA406
Scale: N.T.S.	Checked By: PARKS PLANNING			Old Drawing No. -



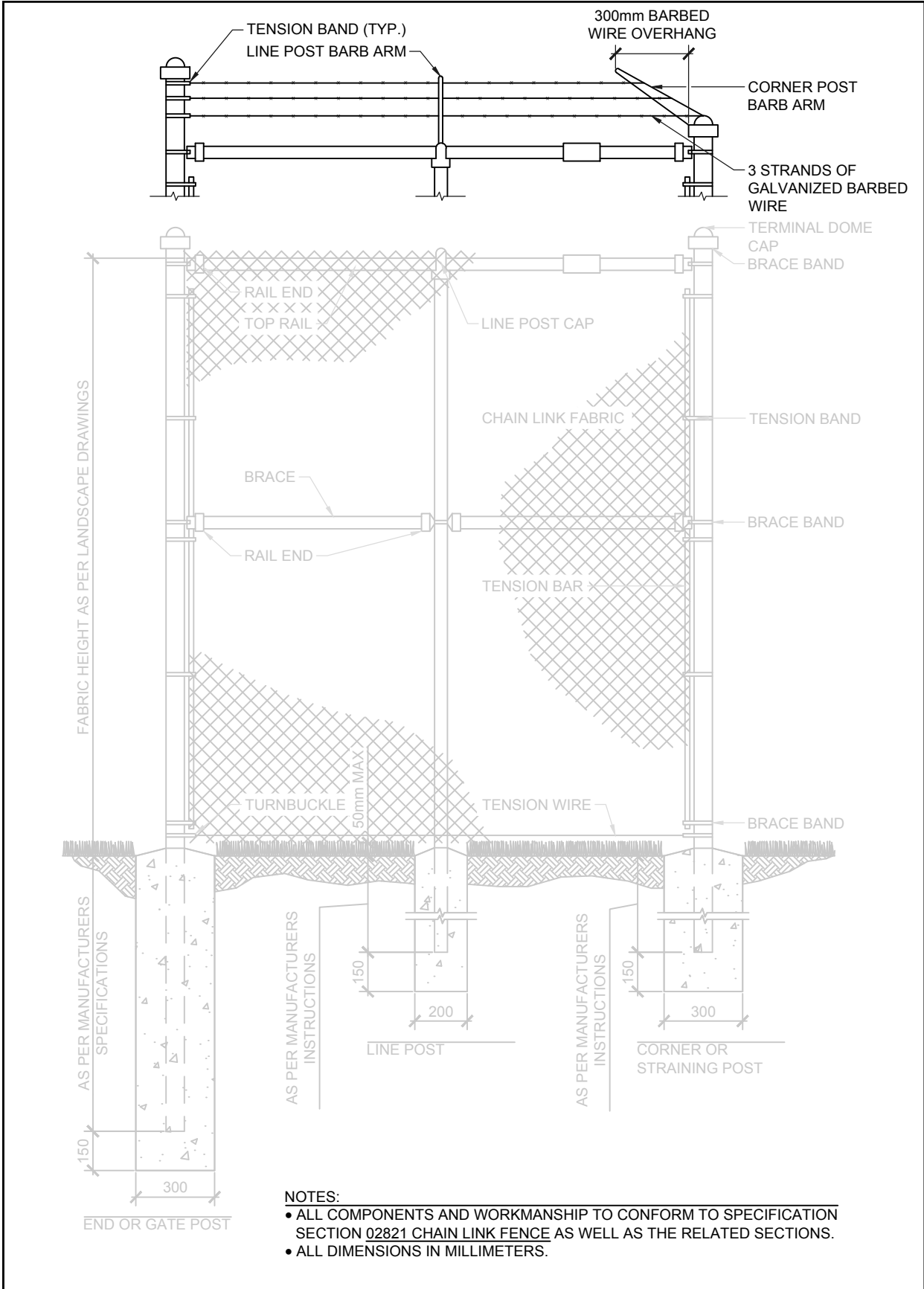
NOTES:

- ALL COMPONENTS AND WORKMANSHIP TO CONFORM TO SPECIFICATION SECTION 02821 CHAIN LINK FENCE AS WELL AS THE RELATED SECTIONS.
- ALL DIMENSIONS IN MILLIMETERS.



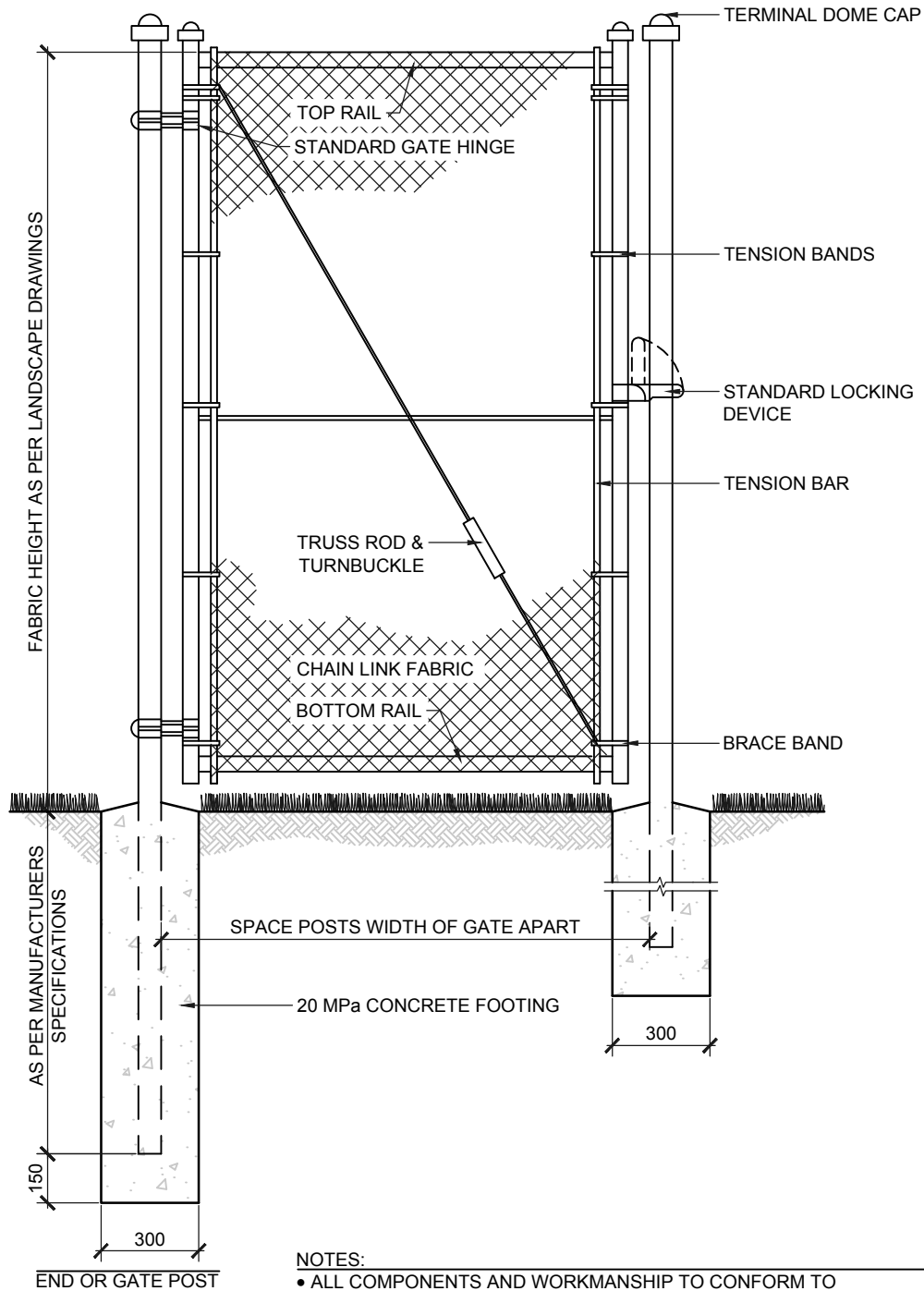
CHAIN LINK FENCE

Date Approved: JUNE 2015	Drawn By: PARKS PLANNING	Approved: <i>Frank Gasparik</i>	Revision	Drawing No. LA407
Scale: N.T.S.	Checked By: PARKS PLANNING			Old Drawing No. 9450



THE CITY OF
Edmonton **BARBED WIRE FOR CHAIN LINK FENCE**

Date Approved: JUNE 2015	Drawn By: PARKS PLANNING	Approved: <i>Frank Gasparik</i>	Revision	Drawing No. LA407A
Scale: N.T.S.	Checked By: PARKS PLANNING			Old Drawing No. N/A



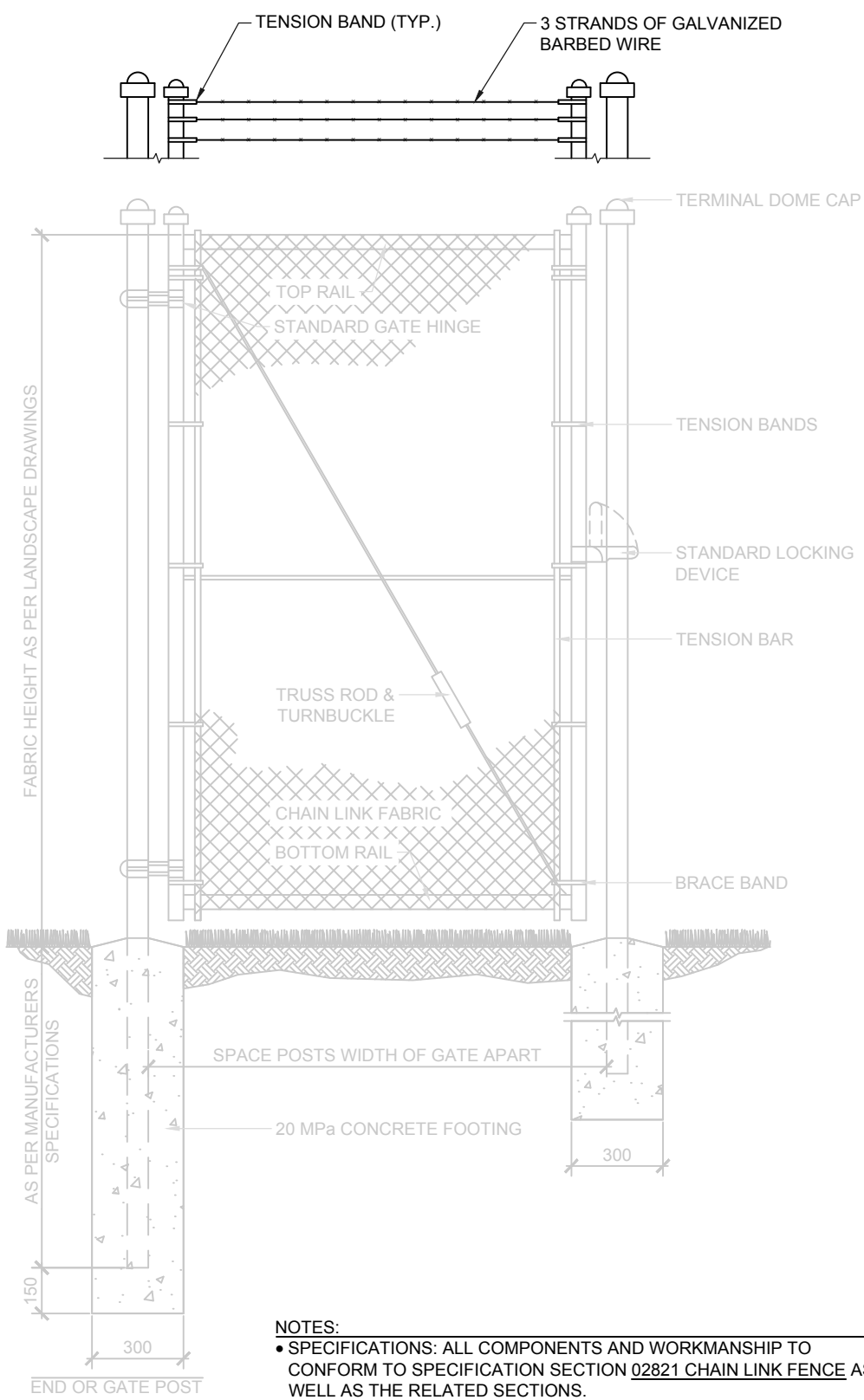
NOTES:

- ALL COMPONENTS AND WORKMANSHIP TO CONFORM TO SPECIFICATION SECTION 02821 CHAIN LINK FENCE AS WELL AS THE RELATED SECTIONS.
- ALL DIMENSIONS IN MILLIMETERS.



CHAIN LINK FENCE SINGLE GATE

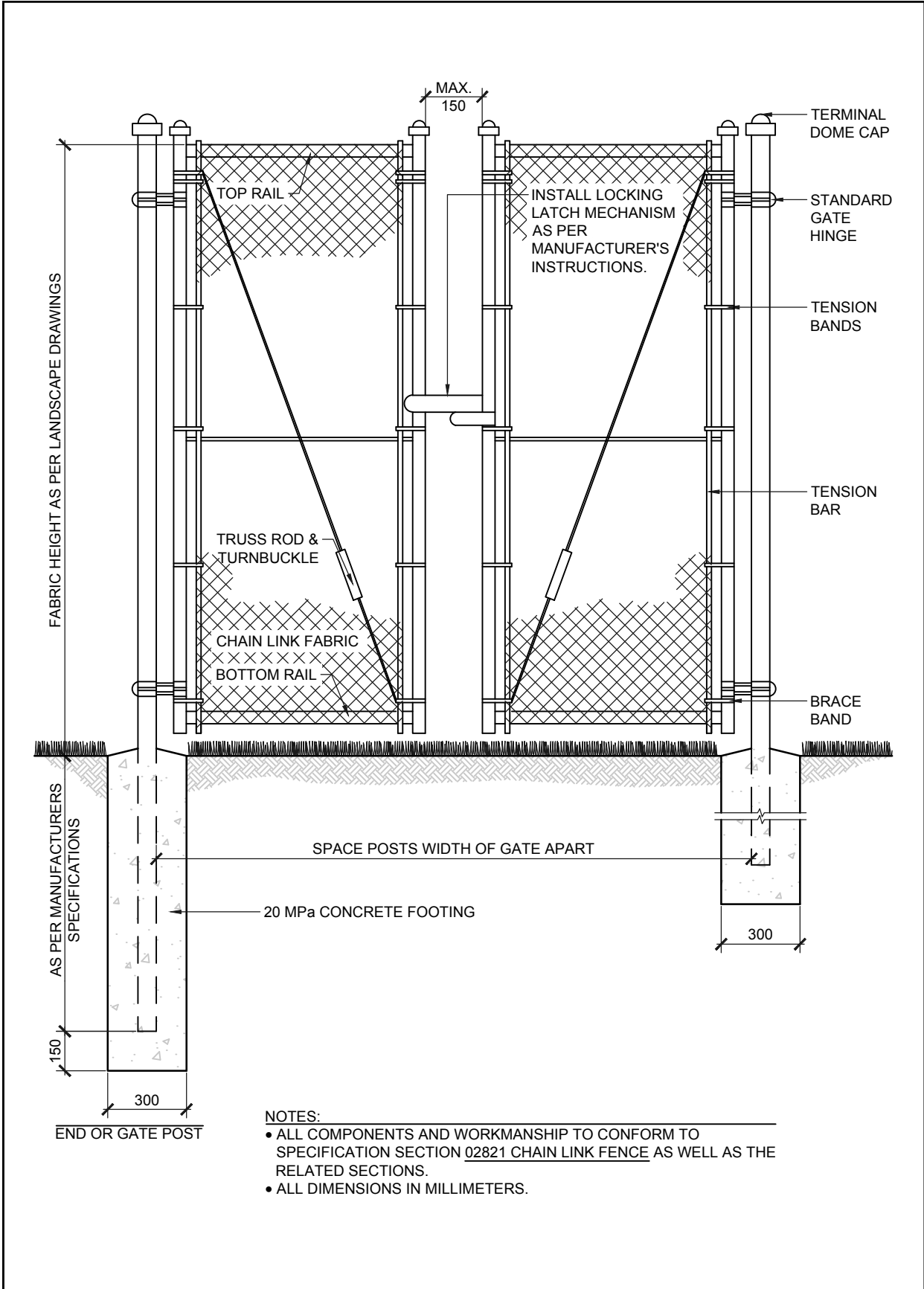
Date Approved: JUNE 2015	Drawn By: PARKS PLANNING	Approved: <i>Frank Gasparik</i>	Revision	Drawing No. LA408
Scale: N.T.S.	Checked By: PARKS PLANNING			Old Drawing No. 9452



- NOTES:**
- SPECIFICATIONS: ALL COMPONENTS AND WORKMANSHIP TO CONFORM TO SPECIFICATION SECTION 02821 CHAIN LINK FENCE AS WELL AS THE RELATED SECTIONS.
 - ALL DIMENSIONS IN MILLIMETERS.

THE CITY OF Edmonton **BARBED WIRE FOR CHAIN LINK FENCE SINGLE GATE**

Date Approved: JUNE 2015	Drawn By: PARKS PLANNING	Approved: <i>Frank Gasparik</i>	Revision	Drawing No. LA408A
Scale: N.T.S.	Checked By: PARKS PLANNING			Old Drawing No. N/A



FABRIC HEIGHT AS PER LANDSCAPE DRAWINGS

AS PER MANUFACTURERS SPECIFICATIONS

150

300

END OR GATE POST

MAX.
150

TOP RAIL

TRUSS ROD &
TURNBUCKLE

CHAIN LINK FABRIC
BOTTOM RAIL

INSTALL LOCKING
LATCH MECHANISM
AS PER
MANUFACTURER'S
INSTRUCTIONS.

TERMINAL
DOME CAP

STANDARD
GATE
HINGE

TENSION
BANDS

TENSION
BAR

BRACE
BAND

SPACE POSTS WIDTH OF GATE APART

20 MPa CONCRETE FOOTING

300

NOTES:

- ALL COMPONENTS AND WORKMANSHIP TO CONFORM TO SPECIFICATION SECTION 02821 CHAIN LINK FENCE AS WELL AS THE RELATED SECTIONS.
- ALL DIMENSIONS IN MILLIMETERS.



CHAIN LINK FENCE DOUBLE GATE

Date Approved:
JUNE 2015

Drawn By:
PARKS
PLANNING

Approved:

Frank Gasparik

Revision

Drawing No.

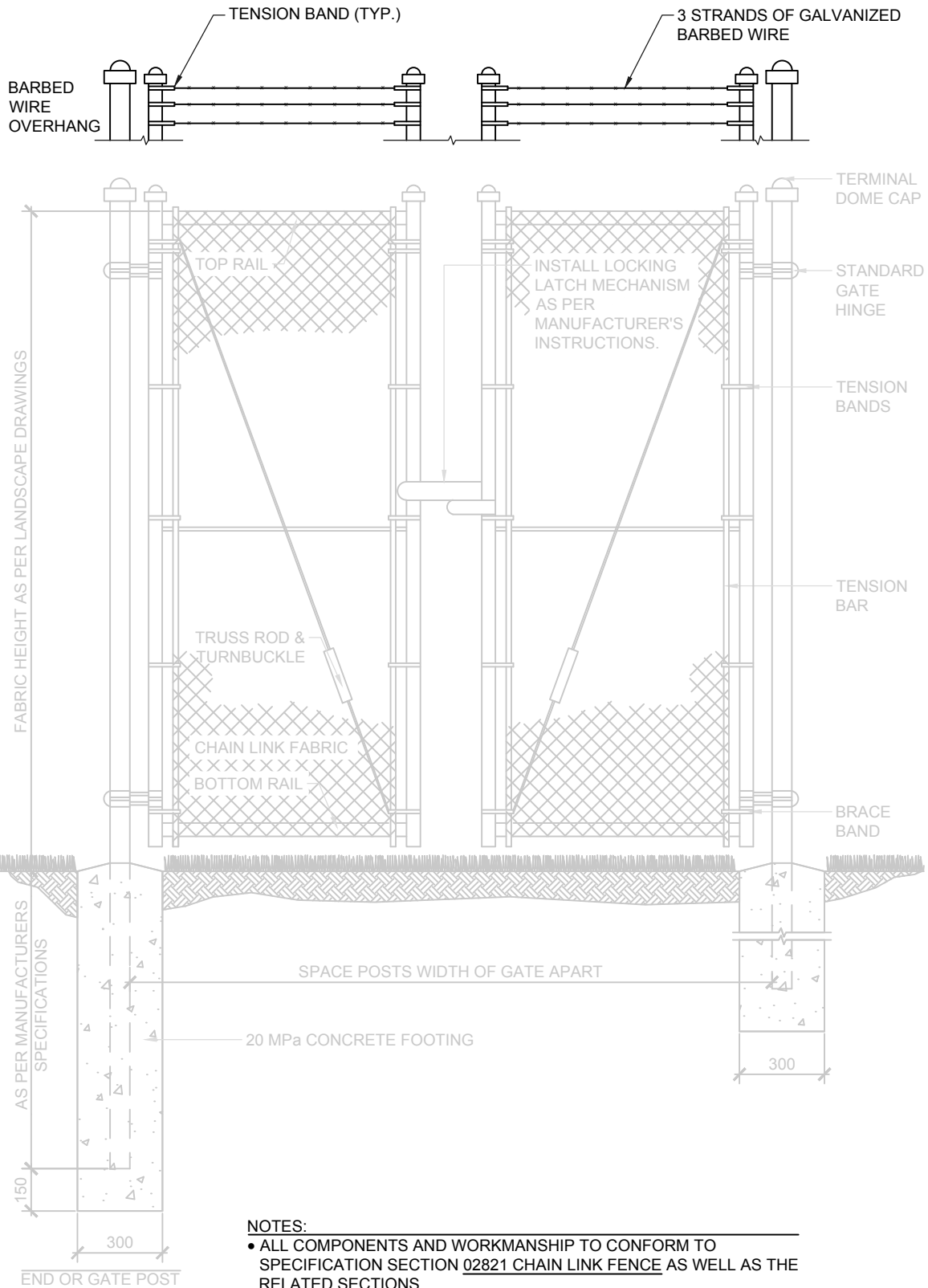
LA409

Scale:
N.T.S.

Checked By:
PARKS
PLANNING

Old Drawing No.

9454

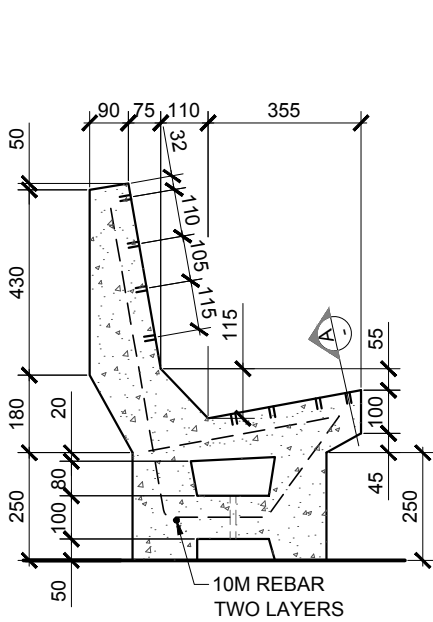


- NOTES:**
- ALL COMPONENTS AND WORKMANSHIP TO CONFORM TO SPECIFICATION SECTION 02821 CHAIN LINK FENCE AS WELL AS THE RELATED SECTIONS.
 - ALL DIMENSIONS IN MILLIMETERS.

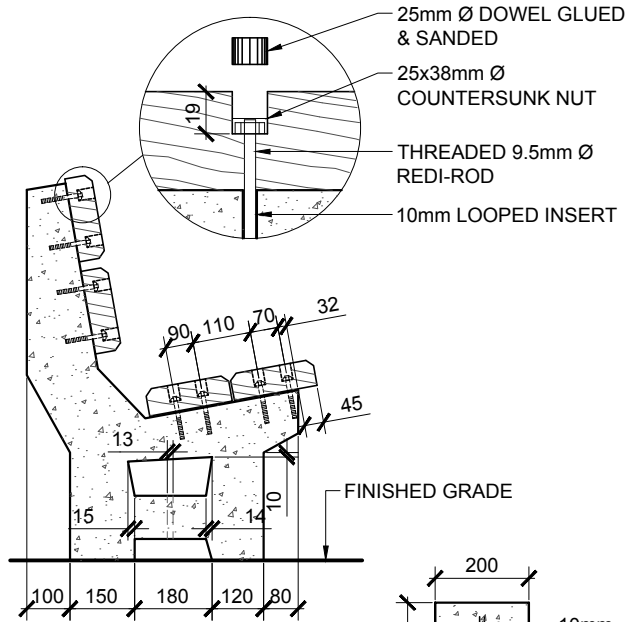


BARBED WIRE FOR CHAIN LINK FENCE DOUBLE GATE

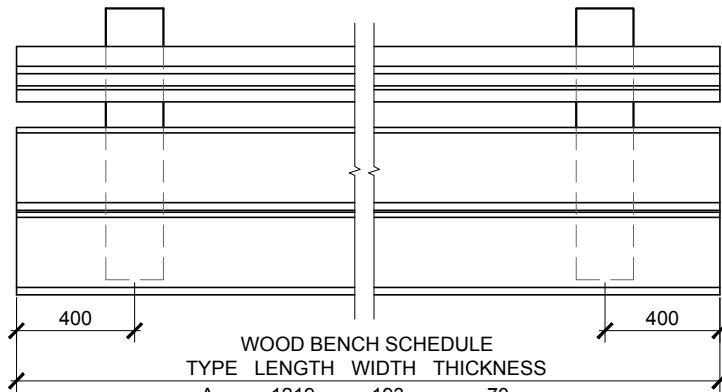
Date Approved: JUNE 2015	Drawn By: PARKS PLANNING	Approved: <i>Frank Gasparik</i>	Revision	Drawing No. LA409A
Scale: N.T.S.	Checked By: PARKS PLANNING			Old Drawing No. N/A



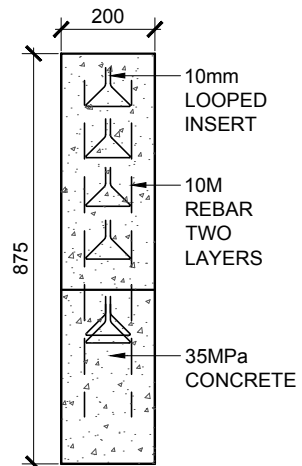
SECTION



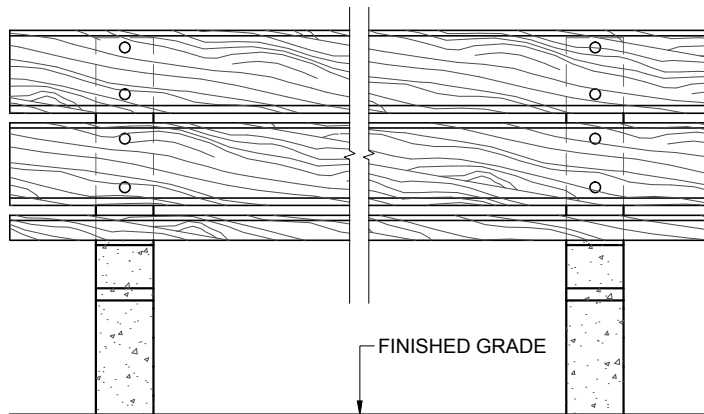
SIDE ELEVATION



PLAN



SECTION 'A'



FRONT ELEVATION

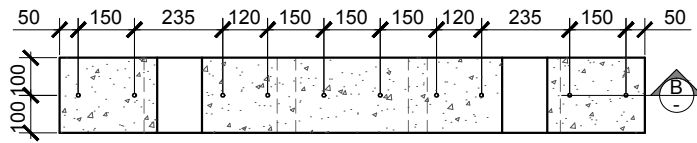
NOTES:

- WOOD TO BE SELECT, CLEAR NO. 1 DOUGLAS FIR, PINE, WESTERN CEDAR OR GLUE LAMINATED DOUGLAS FIR.
- STAIN WITH TWO COATS OF SEKINS (CETOL) CLEAR STAIN.
- PRECAST CONCRETE TO BE:
 - PEA GRAVEL (NATURAL ROUND)
 - MIN. STRENGTH 35MPa
 - AIR CONTENT 3 - 6%
 - SLUMP 100mm
 - SURFACE TO BE EXPOSED AGGREGATE (NOT SANDBLASTED)
 - SUPPLY SAMPLE FINISH FINISH 300 x 300mm SQ.
- REFER TO DETAIL LA502 FOR INSTALLATION OF BENCHES.

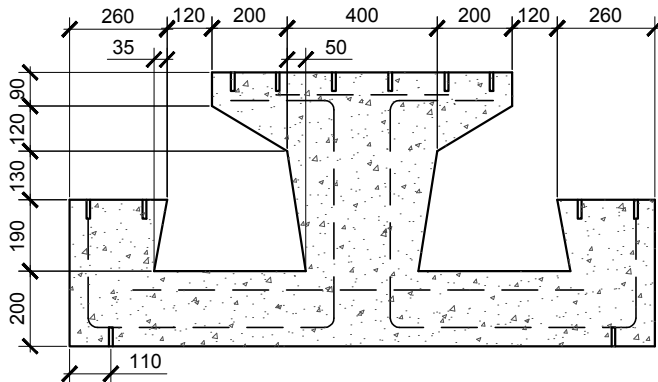


BENCH - WOOD & CONCRETE

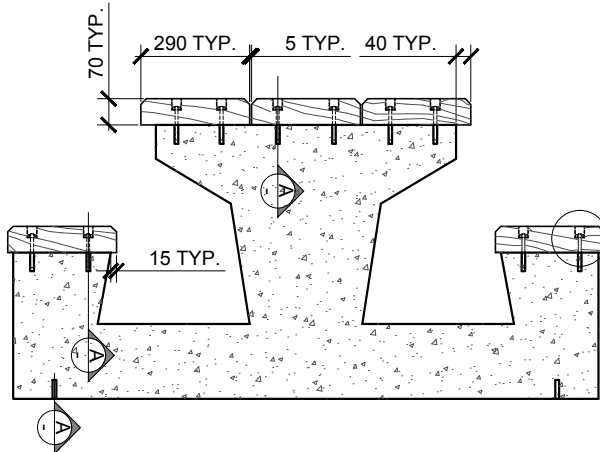
Date Approved: SEPT 2013	Drawn By: PARKS PLANNING	Approved: 	Revision	Drawing No. LA500
Scale: N.T.S.	Checked By: PARKS PLANNING			Old Drawing No. SP429



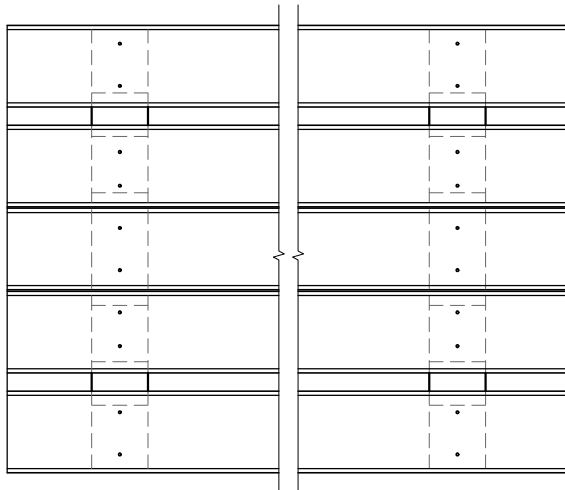
PLAN OF CONCRETE COMPONENT



SECTION 'B'



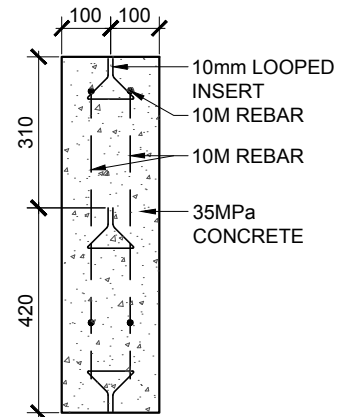
END ELEVATION



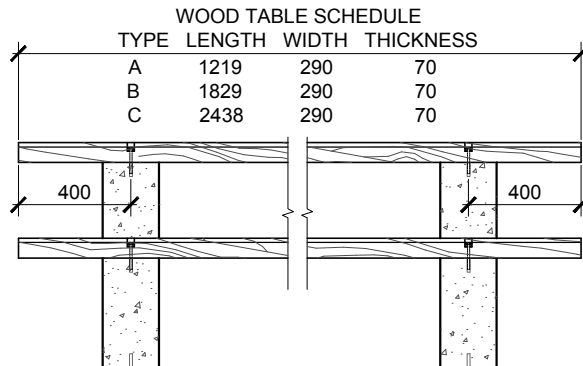
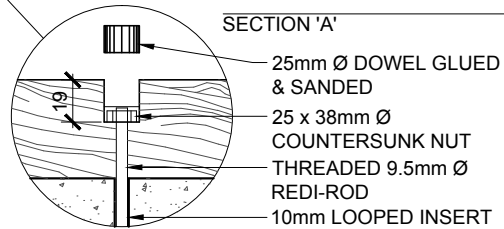
PLAN

NOTES:

- WOOD TO BE SELECT, CLEAR NO. 1 DOUGLAS FIR, PINE, WESTERN CEDAR OR GLUE LAMINATED DOUGLAS FIR.
- STAIN WITH TWO COATS OF SEKINS (CETOL) CLEAR STAIN.
- PRECAST CONCRETE TO BE:
 - PEA GRAVEL (NATURAL ROUND)
 - MIN. STRENGTH 35MPa
 - AIR CONTENT 3 - 6%
 - SLUMP 100mm
 - SURFACE TO BE EXPOSED AGGREGATE (NOT SANDBLASTED)
 - SUPPLY SAMPLE FINISH FINISH 300 x 300mm SQ.
- REFER TO DETAIL LA503 FOR INSTALLATION OF PICNIC TABLES.



SECTION 'A'



SIDE ELEVATION



PICNIC TABLE - WOOD & CONCRETE

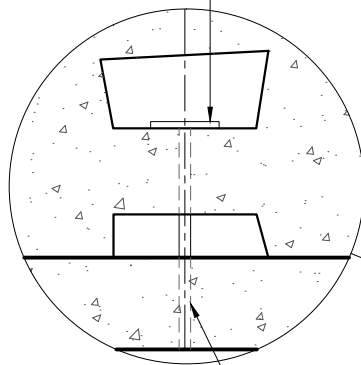
Date Approved: SEPT 2013	Drawn By: PARKS PLANNING	Approved: 	Revision	Drawing No. LA501
Scale: N.T.S.	Checked By: PARKS PLANNING			Old Drawing No. SP428

WOOD BENCH SCHEDULE

TYPE	LENGTH	WIDTH	THICKNESS
A	1219	193	70
B	1829	193	70
C	2438	193	70
D	3048	790	70
E	3658	193	70

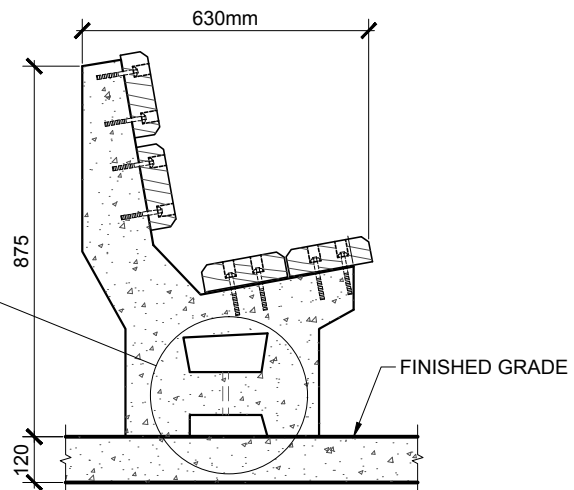
FRONT ELEVATION

13mm THREADED ROD C/W
W49 FLAT WASHER & NUT.
ROD RIVETED @ END.



13mm Ø 50mm LENGTH
ANCHOR INSTALLED ON
CONCRETE PAD OR FOOTING
AS INDICATED ON DESIGN.

SIDE ELEVATION



SIDE ELEVATION

NOTES:

- SPECIFICATIONS: ALL COMPONENTS AND WORKMANSHIP CONFORM TO SPECIFICATION 02870 SITE FURNISHINGS AS WELL AS THE RELATED SECTIONS.
- REFER TO CONSTRUCTION DETAIL LA500 FOR ALL METHODS AND MATERIALS REGARDING CONSTRUCTION OF BENCHES.



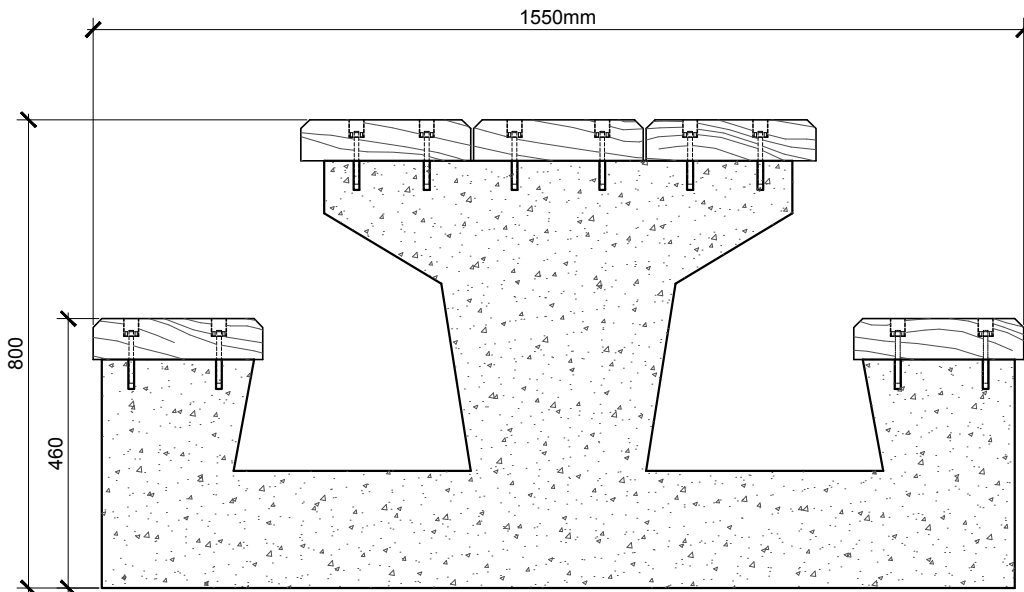
BENCH INSTALLATION

Date Approved: SEPT 2013	Drawn By: PARKS PLANNING	Approved: 	Revision	Drawing No. LA502
Scale: N.T.S.	Checked By: PARKS PLANNING			Old Drawing No. SP313

WOOD TABLE SCHEDULE

TYPE	LENGTH	WIDTH	THICKNESS
A	1219	290	70
B	1829	290	70
C	2438	290	70

SIDE ELEVATION



END ELEVATION

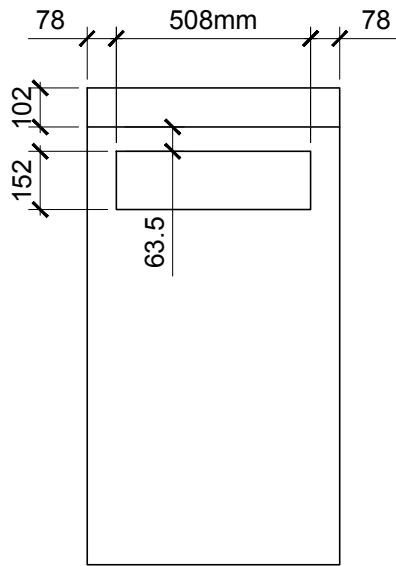
NOTES:

- SPECIFICATIONS: ALL COMPONENTS AND WORKMANSHIP CONFORM TO SPECIFICATION 02870 SITE FURNISHINGS AS WELL AS THE RELATED SECTIONS.
- REFER TO CONSTRUCTION DETAIL LA501 FOR ALL METHODS AND MATERIALS REGARDING CONSTRUCTION OF PICNIC TABLES.
- NO ANCHOR OR FOOTINGS REQUIRED FOR INSTALLATION.

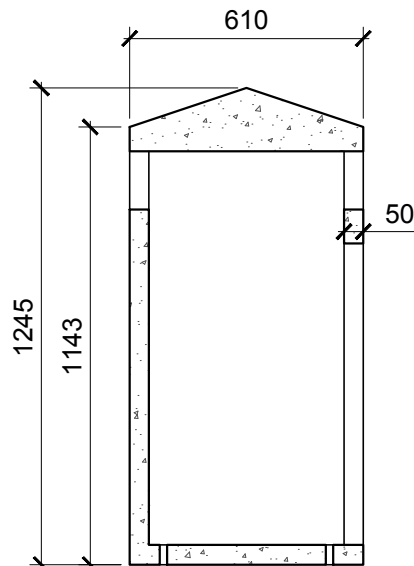


PICNIC TABLE - INSTALLATION

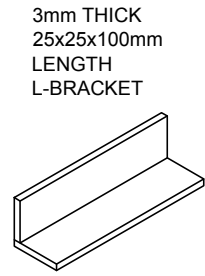
Date Approved: SEPT 2013	Drawn By: PARKS PLANNING	Approved: 	Revision	Drawing No. LA503
Scale: N.T.S.	Checked By: PARKS PLANNING			Old Drawing No. SP312



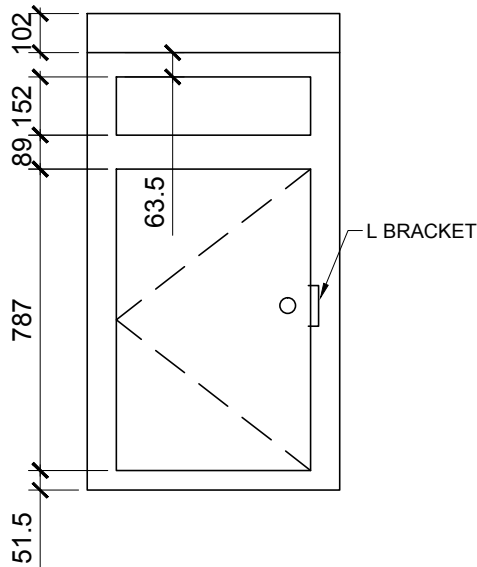
FRONT ELEVATION



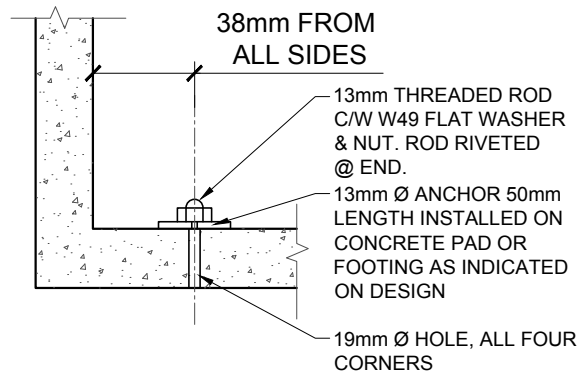
CROSS SECTION



L-BRACKET DETAIL



REAR ELEVATION



INSTALLATION DETAIL

NOTES:

- SPECIFICATIONS: ALL COMPONENTS AND WORKMANSHIP CONFORM TO SPECIFICATION SECTION 02870 SITE FURNISHINGS AS WELL AS THE RELATED SECTIONS.
- FOR INSTALLATION ON ASPHALT, UNISTONE OR SHALE SURFACE USE 13mm x 1000mm LONG ROD THREADED AT ONE END AND DRIVEN THROUGH SURFACE INTO SUBGRADE.
- TYPICAL CONCRETE STRENGTH TO BE 4000 P.S.I. AT 28 DAYS.
- TYPICAL REBAR TO BE #10 EACH CORNER & #10 HORIZONTAL (2 FACES).
- 13mm NATURAL STONE AGGREGATE FINISH.
- DOOR TO HAVE 2 HINGES AND 6mm KEY LOCKS.
- CAPACITY - 25 LITRES.
- "L" BRACKET TO BE PAINTED BLACK.
- WELD "L" BRACKET ON INSIDE DOOR, CENTER TO KEY HOLE.

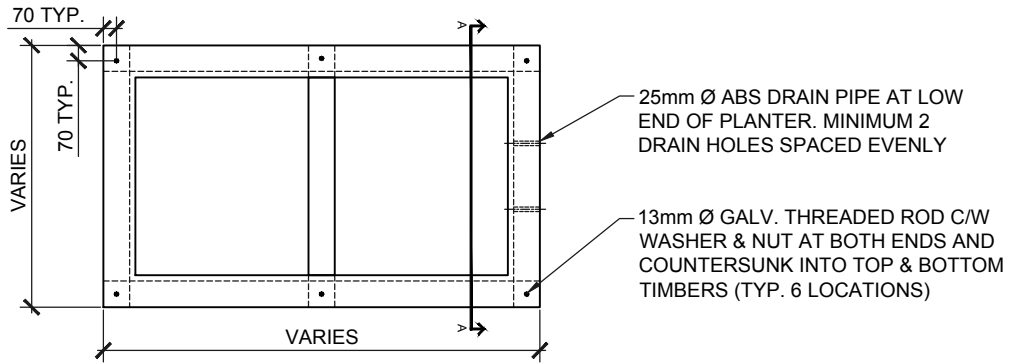


CONCRETE LITTER CONTAINER & INSTALLATION

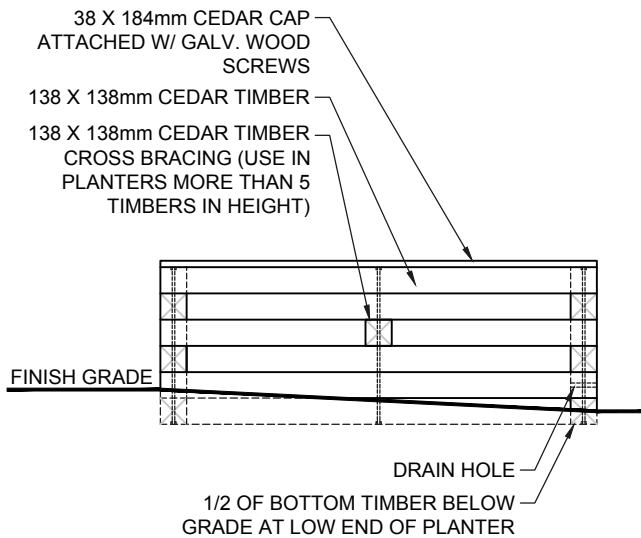
Date Approved: SEPT 2013	Drawn By: PARKS PLANNING	Approved: 	Revision	Drawing No. LA504
Scale: N.T.S.	Checked By: PARKS PLANNING			Old Drawing No. SP314

NOTES:

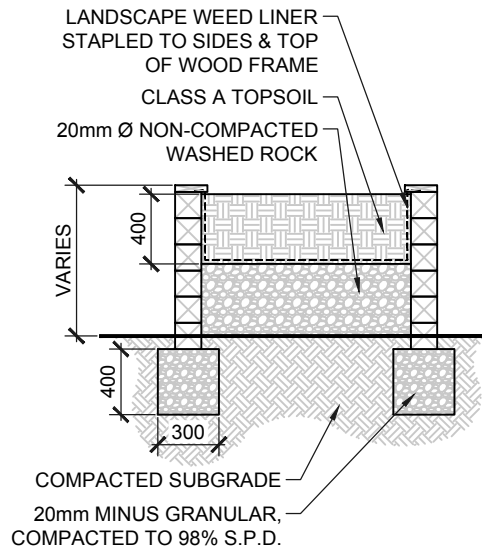
- ALL TIMBER TO BE CEDAR.
- ALL HARDWARE TO BE GALVANIZED. USE AS REQUIRED TO ENSURE SECURE ASSEMBLY.
- ALL DIMENSIONS IN MILLIMETERS.



PLAN



ELEVATION

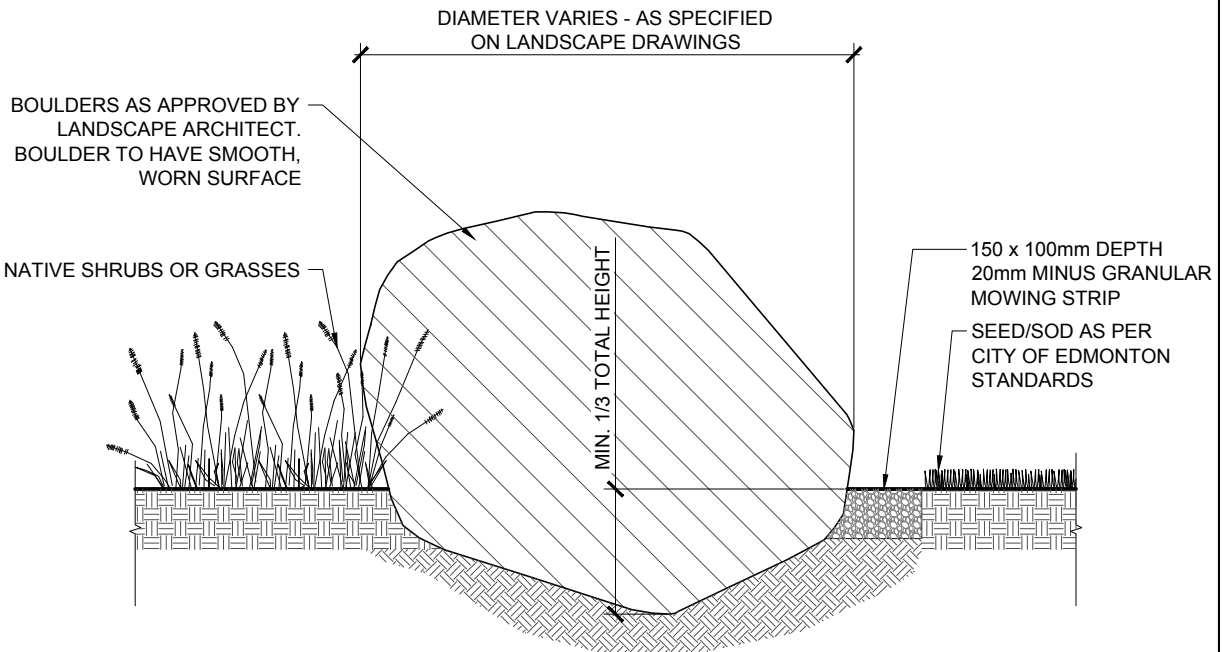


SECTION AA



COMMUNITY GARDEN PLANTER

Date Approved: JUNE 2015	Drawn By: PARKS PLANNING	Approved: <i>Frank Gasparik</i>	Revision	Drawing No. LA505
Scale: N.T.S.	Checked By: PARKS PLANNING			Old Drawing No. N/A



NATURAL AREA INSTALLATION


FORMAL/MAINTAINED INSTALLATION

NOTES:

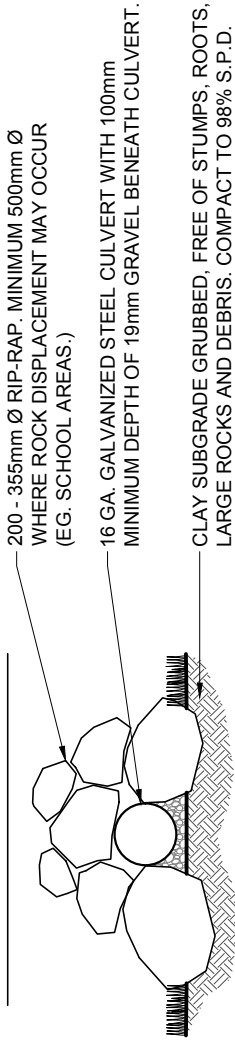
- IF BOULDERS ARE BEING PLACED IN AN AREA TO BE FINAL GRADED WITH GROWING MEDIUM, ENSURE THAT BOULDERS ARE IN PLACE PRIOR TO PLACEMENT OF GROWING MEDIUM.
- ENSURE BOULDERS ARE COMPLETELY SETTLED AND STABLE. BURY TO MINIMUM 1/3 TOTAL HEIGHT.
- 20mm MINUS GRANULAR. SECTION 2060 AGGREGATE DESIGNATION 3, CLASS 20A, FIRMLY COMPACTED.



BOULDER INSTALLATION

Date Approved: SEPT 2013	Drawn By: PARKS PLANNING	Approved: 	Revision	Drawing No. LA600
Scale: N.T.S.	Checked By: PARKS PLANNING			Old Drawing No. -

FINISHED ELEVATION OF ASPHALT WALKWAY



200 - 355mm Ø RIP-RAP. MINIMUM 500mm Ø WHERE ROCK DISPLACEMENT MAY OCCUR (EG. SCHOOL AREAS.)

16 GA. GALVANIZED STEEL CULVERT WITH 100mm MINIMUM DEPTH OF 19mm GRAVEL BENEATH CULVERT.

CLAY SUBGRADE GRUBBED, FREE OF STUMPS, ROOTS, LARGE ROCKS AND DEBRIS. COMPACT TO 98% S.P.D.

ELEVATION

WALKWAY AS SPECIFIED ON LANDSCAPE DRAWINGS.

200 - 355mm Ø RIP-RAP. MINIMUM 500mm Ø WHERE ROCK DISPLACEMENT MAY OCCUR (EG. SCHOOL AREAS.)

VARIES

16 GA. GALVANIZED STEEL CULVERT. CUT CULVERT ENDS ON ANGLE.

MIN. 1% SLOPE

CLAY SUBGRADE GRUBBED, FREE OF STUMPS, ROOTS, LARGE ROCKS AND DEBRIS. COMPACT TO 98% S.P.D.

900mm MIN.

100mm MINIMUM DEPTH OF 19mm GRAVEL BENEATH CULVERT.

CROSS SECTION

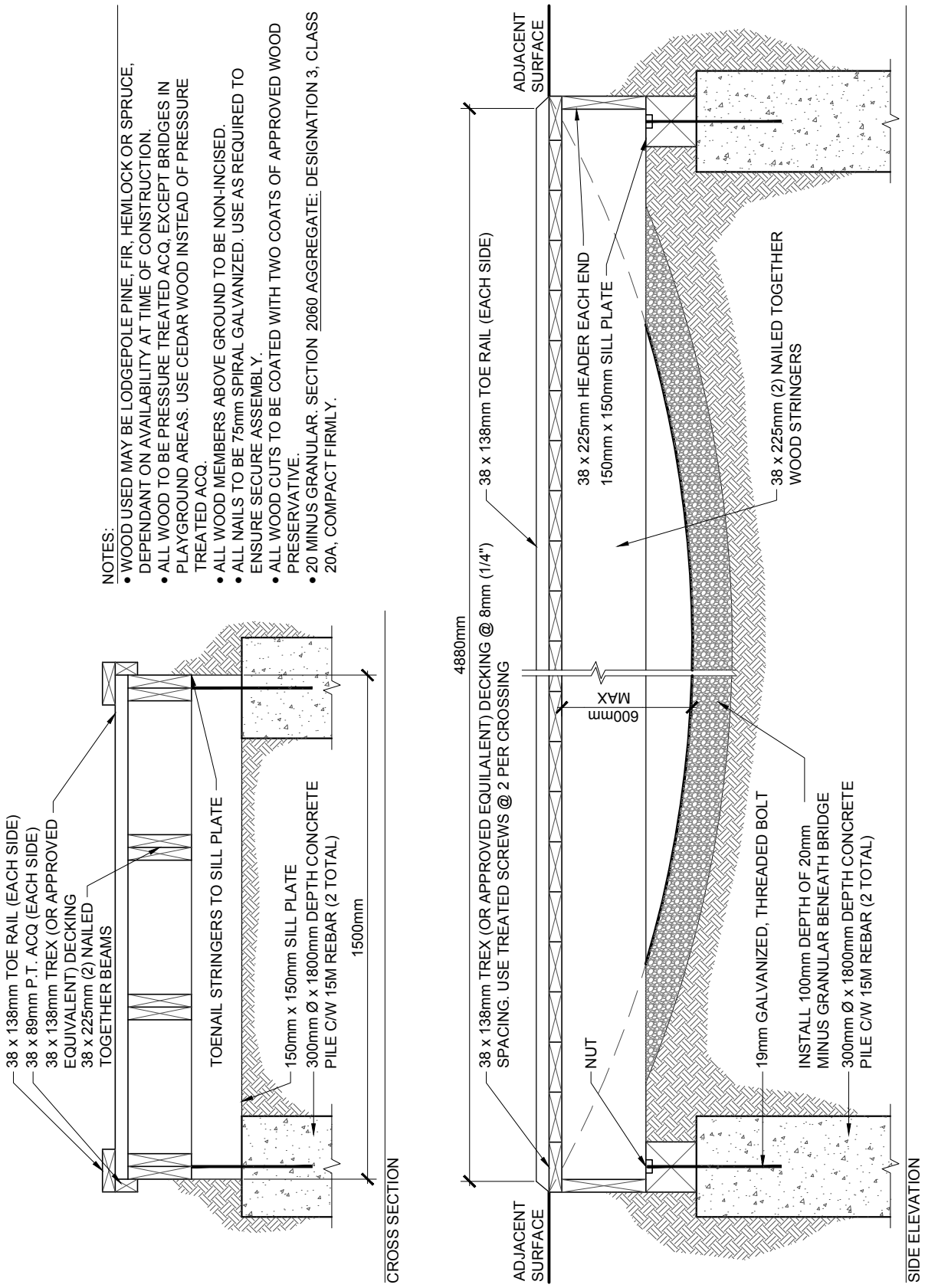
NOTES:

- SPECIFICATIONS AND WORKMANSHIP CONFORM TO SPECIFICATION SECTION 02640 CORRUGATED STEEL PIPE CULVERT AS WELL AS THE RELATED SECTIONS.
- 20mm MINUS GRANULAR. SECTION 2060 AGGREGATE DESIGNATION 3, CLASS 20A, COMPACT TO 97% S.P.D.



CULVERT UNDER WALKWAY

Date Approved: SEPT 2013	Drawn By: PARKS PLANNING	Approved: 	Revision	Drawing No. LA601
Scale: N.T.S.	Checked By: PARKS PLANNING			Old Drawing No. -



- NOTES:**
- WOOD USED MAY BE LODGEPOLE PINE, FIR, HEMLOCK OR SPRUCE, DEPENDANT ON AVAILABILITY AT TIME OF CONSTRUCTION.
 - ALL WOOD TO BE PRESSURE TREATED ACQ, EXCEPT BRIDGES IN PLAYGROUND AREAS. USE CEDAR WOOD INSTEAD OF PRESSURE TREATED ACQ.
 - ALL WOOD MEMBERS ABOVE GROUND TO BE NON-INCISED.
 - ALL NAILS TO BE 75mm SPIRAL GALVANIZED. USE AS REQUIRED TO ENSURE SECURE ASSEMBLY.
 - ALL WOOD CUTS TO BE COATED WITH TWO COATS OF APPROVED WOOD PRESERVATIVE.
 - 20 MINUS GRANULAR. SECTION 2060 AGGREGATE: DESIGNATION 3, CLASS 20A, COMPACT FIRMLY.



WOOD BRIDGE WITH RECYCLED PLASTIC PRODUCT DECK

Date Approved: SEPT 2013	Drawn By: PARKS PLANNING	Approved: 	Revision	Drawing No. LA602
Scale: N.T.S.	Checked By: PARKS PLANNING			Old Drawing No. -

Landscape Construction Specification Reference

Specification No.	Specification Title	Issue Date
02821	Chain Link Fence	March 2021
02870	Site Furnishings	March 2021
02910	Topsoil	March 2021
02914	Mulches	March 2021
02918	Colour Coding of T-Bar Tree Stakes	March 2021
02920	Seed and Sod	March 2021
02930	Trees, Shrubs and Ground Covers	March 2021
02931	Naturalization	March 2021
04420	Feature Boulders and Collected Stone	March 2021

1. GENERAL

1.1 SCOPE

Supply and installation of chain link fence.

1.2 RELATED SECTIONS

Cement Concrete Section 7.1, Volume 2 Complete Streets

2. PRODUCTS

2.1 CHAIN LINK FABRIC: conforming to CGSB CAN2-138.1M.

2.1.1 Type I steel fabric, medium style; class A zinc-coated, grade 1 at minimum 490 g/m².

2.1.2 Nominal wire diameter: 3.5 mm (9-gauge) prior to any applied coating(s).

2.1.3 Mesh size: 50 mm.

2.1.4 Fabric height: 1.2, 1.5, 1.8, 2.1 or 2.4 m as specified.

2.1.5 Selvage: twisted top and knuckled bottom.

2.1.6 Any additional or applied coatings for fences that will be maintained by the City must be approved by Parks prior to being applied.

2.2 FENCE FRAMEWORK: conforming to CGSB CAN2-138.2M

2.2.1 Posts and Rails: Hot-dip galvanized welded steel pipe, standard weight (schedule 40, ASTM A120), zinc-coated at minimum 550 g/m² and with the following minimum dimensions:

Fabric Height (m)	1.2	1.5	1.8	2.1	2.4
Line Post Outside Diameter (OD, mm)	48.3	48.3	60.3	60.3	60.3
Length (m)	2.0	2.3	2.6	2.9	3.2
Terminal Post (end, gate corner, straining) (OD, mm)	73.0	73.0	88.9	88.9	88.9
Length (m)	2.3	2.6	2.9	3.2	3.5
Rail and Brace (OD, mm)	-	-	42.2	42.2	42.2

2.2.2 Bottom Tension Wire: 5 mm diameter (6-gauge) steel wire, zinc-coated at minimum 490 g/m²

2.3 FITTINGS: CONFORMING TO ASTM F626 AS FOLLOWS

	Minimum Dimensions (mm)	Min Zinc Coating (g/m²)	Fabrication Material
Post Cap and Rail End	varies	366	Pressed Steel or Cast Iron
Top Rail Sleeve	2.0 thick x 175 long	366	Round Steel Tubing
Tie Wire and Clip	3.5 diameter (9 gauge aluminium)	122	Round Steel Tubing
Tension and Brace Bands	2.0 thick x 19.0 wide	366	Pressed Steel
Tension Bar	5.0 thick x 16.0 wide	366	Steel Strip
Turnbuckle	varies	366	Steel
Barb Arm	2.0 thick (14 - gauge)	366	Pressed Steel

2.4 BARBED WIRE OVERHANG:

May be specified in the work item, specifying fences 1.8 m in height or greater.

2.4.1 End and Gate Posts: To be 1.4 m longer than fabric height when barbed wire overhang is specified.

2.4.2 Barb Arms: Fabricated as in 2.1.3 with eyes to hold top rail; to hold 3 strands of barbed wire, top strand to be 300 mm above fabric; vertical or at 45° overhang, as specified.

2.4.3 Barbed Wire: Conforming to ASTM A121 and CGSB CAN2-138.2M, with 3 strands, 2 wires each strand; each wire 2.5 mm diameter (12.5 gauge), zinc-coated at minimum 245 g/m². Barbs to have 4 points, each 10 mm minimum length, at 150 mm maximum spacing, made from 2 mm diameter (14-gauge) steel wire with minimum 183 g/m² zinc coating.

2.5 GATES:

2.5.1 Gate Fabric: To match fence fabric Clause 2.1.1.

2.5.2 Gate Frame: As in Clause 2.2.1 with minimum 42.2 mm outside diameter; to be electrically welded at all joints and hot-dip galvanized after welding. If braces are required, use truss rod and turnbuckle adequate for gate size.

2.5.3 Gate Fittings: Malleable iron hinges, latch and latch catch, all galvanized as specified in Clause 2.1.1. Latch catch to have provision for a padlock that can be attached and operated from either side of gate. Hinges shall permit gate to open 90° or 180° as specified.

2.5.4 Double Gate: To have centre rest with drop bolt for closed position and chain hook to hold gates open, all galvanized as specified in Clause 2.1.1.

2.5.5 Gate Barbed Wire: If required, to match fence barbed wire.

2.5.6 Zinc pigmented paint: Submit paint sample to the City for approval.

2.6 CONCRETE FOR POST FOOTING::

Conforming to Section 7.1 Volume 2 Complete Streets, Cement Concrete, Class E with the following modified criteria:

Minimum compressive strength: 17.5 MPa at 28 days

Maximum aggregate size: 25 mm

3. EXECUTION

3.1 SITE PREPARATION

3.1.1 Necessary site clearing and grading will be done by others, or as specified in the Special Provisions.

3.1.2 The fence contractor shall do minor levelling of the ground where necessary.

3.1.3 The City will stake out fence lines and locations of end, corner and gate posts.

3.2 POST LOCATION

3.2.1 Line Posts: Set line posts not more than 3 m apart, measured parallel to ground surface.

3.2.2 Straining Posts: Where end or corner posts are more than 150 m apart over reasonably smooth grade, set straining posts at equal intervals not exceeding 150 m on a straight continuous stretch of fence. Set additional straining posts at sharp changes in grade or where directed by the City.

3.2.3 Corner Post: Set corner post where change in alignment exceeds 20°.

3.2.4 Gate Posts: Set gate posts on both sides of gate opening.

3.2.5 End Post: set end post at end of fence.

3.3 POST SETTING

3.3.1 Post Hole: Dig or drill post holes to the following minimum diameters and depths that will allow at least 150 mm of footing below bottom of post.

Fabric Height (m)	1.2	1.5	1.8	2.1	2.4
Line Post Hole Diameter (mm)	200	200	250	250	250
Depth (m)	0.9	0.9	0.9	0.9	0.9
Terminal Post Hole Diameter (mm)	300	300	360	360	360
Depth (m)	1.2	1.2	1.2	1.2	1.2

3.3.2 Concrete Footing: Place concrete in post hole and embed post to a minimum depth below ground of 0.75 m for line posts and 1.05 m for terminal posts. Extend concrete 50 mm above ground level and crown to drain away from post. Brace post

in plumb position and true to alignment and elevation until the concrete has set. Let concrete footing cure for a minimum 5 days before proceeding with further work.

- 3.3.3 Poor Soil:** In poor soil conditions, set post into concrete footing of such diameter and depth as will provide adequate stability to the fence, subject to acceptance by the City.

3.4 TOP RAIL

- 3.4.1** Support top rail at each line post with a line post cap so that a continuous brace is formed between terminal posts.
- 3.4.2** Join rails with sleeves to allow for expansion and contraction. Securely fasten top rail to terminal posts using rail ends and brace bands.

3.5 TERMINAL POST BRACING

- 3.5.1** Install brace from end and gateposts to nearest line post at mid-panel and parallel to top rail.
- 3.5.2** Install braces on both sides of corner and straining posts in similar manner.

3.6 BOTTOM TENSION WIRE

Install tension wire within the bottom 50 mm of fabric. Stretch wire taut and free of sag and fasten securely to end, corner, gate and straining posts with tension bands and turnbuckles

3.7 CHAIN LINK FABRIC

- 3.7.1** Place fabric outside of area enclosed, or as directed by the City. Bottom of fabric shall be 50 mm above finished ground level.
- 3.7.2** Stretch fabric to tension recommended by manufacturer and fasten to end, corner, gate and straining posts using tension bands at 300 mm spacing.
- 3.7.3** \Secure fabric to line post and top rail with tie wire at 450 mm intervals. Give tie wires a minimum of 2 twists. Tie wires are not to protrude out, they are to be folded inwards. Secure fabric to bottom tension wire with hog rings (clip ties) at 450 mm intervals.
- 3.7.4** Installed fabric shall have a smooth uniform appearance free of sag, dent and bulge.
- 3.7.5** Barbed twist to be placed down, when installing fence.

3.8 GATES

- 3.8.1** Install gates according to the drawings or as directed by the City. Reference Detail LA408 – LA409A.
- 3.8.2** For a double gate, cast centre rest in concrete and dome concrete above ground level to shed water.
- 3.8.3** Install gates true to opening and plumb in a closed position.
- 3.8.4** Install gate stops where indicated.

3.9 BARBED WIRE OVERHANG

3.9.1 If barbed wire is specified, install barb arms in lieu of caps on top of line, straining and corner posts. Position overhang towards area enclosed, unless directed otherwise.

3.9.2 Stretch each barbed wire strand taut and free of sag, attach firmly into slots of barb arms and secure to end and gate posts.

3.10 TOUCH UP

Clean damaged surfaces with wire brush to remove loose and cracked spelter coatings. Then apply 2 coats of approved zinc pigmented paint.

3.11 WORKMANSHIP

The installed chain link fence shall be free of any defect or imperfection that can affect its serviceability and appearance. The fence shall follow ground contours smoothly without sharp changes in grade.

3.12 CLEANUP

3.12.1 Clear the work site of excavated material, surplus material and all debris.

3.12.2 Repair damaged sod. Leave site smooth and consistent with surrounding grades.

END OF SECTION

1. GENERAL**1.1 SCOPE**

- 1.1.1** Furniture wood, stain, preservatives, application, assembly, installation and hardware.
- 1.1.2** All landscape furniture elements to be fully assembled in shop prior to delivery to the site.
- 1.1.3** Protect furniture during transportation to site.
- 1.1.4** The City may elect to supply approved standard furniture from an approved supplier or custom manufacturer, all to approved shop drawings and specifications. Approved landscape drawings and specifications will outline supply details.

1.2 INSPECTION

The City will inspect all landscape furniture prior to installation. Broken, scarred, or damaged furniture elements will not be accepted.

2. PRODUCTS**2.1 MATERIALS**

- 2.1.1** All wood furniture elements to be No. 1 wood as defined by the Alberta Forest Products Association.
- 2.1.2** All wood furniture elements to be sanded smooth and all edges sanded round with no sharp corners or edges.
- 2.1.3** Vandal Proof (tamper resistant, locking hardware) must be provided at a rate of one per Litter/ Recycling Receptacle, two per Bench and two per Picnic Table.
- 2.1.4** All other fasteners and anchor bolts to be zinc coated, galvanized or stainless steel Type 304 (Grade 18-8).
- 2.1.5** Coat with a water-based and UV resistant City of Edmonton approved stain and top coat.

3. EXECUTION**3.1 PREPARATION**

- 3.1.1** Treat wood after members have been cut to size and all millwork completed.
- 3.1.2** All wood furniture elements to be sanded, cleaned and coated prior to assembly.
- 3.1.3** All wood members shall be stained with a minimum of two coats of a water-based and UV resistant City of Edmonton approved coating.
- 3.1.4** All end cuts shall be treated with a water-based end sealer.
- 3.1.5** Drying time between coats as per manufacturer's specification.
- 3.1.6** All fastening hardware to be counter sunk, prior to staining.
- 3.1.7** All assembled furniture elements shall be securely anchored with stainless, zinc or galvanized coated hardware on site, as specified on the approved landscape drawings and specifications.

END OF SECTION

1. GENERAL

1.1. SCOPE:

Preparing subgrade, importing topsoil, placing topsoil, testing topsoil, and inspections.

Some of this information has been taken from the previous 2017 Topsoil Specification prepared by Klohn Crippen Berger Ltd..

1.2. RELATED SECTIONS:

Trees, Shrubs and Ground Covers Section 02930

1.3. DEFINITIONS

Native Topsoil: the existing fertile, friable, dominantly coarse textured, 'A' horizon containing accumulated organic matter, and usually distinguished by a darker colouration.

Weeds: Includes all weeds identified in the Alberta Weed Control Act.

Qualified Professional: A professional (Agronomist, Soil Scientist) who is trained in the appropriate methods for soil survey, mapping and sampling; is competent to review and interpret analysis laboratory results and provide recommendations on quantities, blending and application methods of soil amendment to achieve the seven topsoil types in Tables 1 and 2.

Capital Projects: Projects that are directly with the City where the City acts as the project manager, and no servicing agreement has been signed with a private developer.

1.4. USE OF TABLES

All Tables are available at the end of this specification.

Table 1 outlines the seven specific end uses and associated topsoil depths and types.

Table 2 outlines the required chemical and physical properties for the topsoil per the different end uses.

Table 3 outlines the required testing quantities for the different end uses.

2. PRODUCTS

2.1. TOPSOIL FROM CITY SOURCE

Obtain from designated City stockpile; free of weeds.

2.2. TOPSOIL MIXTURES:

2.2.1. End Uses and Depths

The following definitions refer to the end uses shown in Table 1, see the end of this specification for the Tables.

- 2.2.1.1. Parks, Playgrounds, School Sites (excluding Standard Sports Fields)
(1a): includes parks, school sites and playgrounds that are developed, owned, controlled, or maintained by the City and intended to be used by members of the

public for recreation and general enjoyment. This may include sodded areas for passive recreation, shrub beds, trees and naturalized areas.

- 2.2.1.2. Greenways (1b): a recognizable linear open space that is a minimum of 10 m wide and connects two public spaces or a public space to non-public land. Greenways typically include a trail constructed of asphalt, crushed rock or wood chips and may also include park furniture. This space may include sod areas for passive recreation, shrub beds, trees, and naturalized areas.
- 2.2.1.3. Public Utility Lots (PUL) (1c): a zone in which a system or works is located that is used to provide for public consumption, benefit, convenience or use such as water or steam, sewage disposal, public transportation, irrigation, drainage, fuel, electric power, heat, waste management and telecommunications. Note: PULs do not include SWMFs.
- 2.2.1.4. Standard Sports Fields (School Sites) (1d): sports fields on school sites that are developed, owned, controlled, or maintained by the City and intended to be used by members of the public for recreation and general enjoyment.
- 2.2.1.5. Stormwater Management Facilities (SWMFs) (1e): SWMFs that are developed, controlled or maintained by the City or EPCOR. This may include sodded areas for passive recreation, naturalized shrub beds, trees and other naturalized areas, but does not include ornamental beds on SWMFs, which fall under End Use (5).
- 2.2.1.6. Premier Sports Fields (Irrigated, may include Subdrainage) (2a): a sport field with specific design and construction parameters that utilizes amended topsoil to address the requirements of higher level competition. The premier sports field will require higher maintenance levels to sustain healthy turf and soil foundation. Premier sports fields (2a) will include irrigation and may include subdrainage systems. Note: Specialized fields such as sand based, gravel based or artificial turf fields have specific design and construction parameters that are not covered by this Topsoil Specification.
- 2.2.1.7. Roads, Boulevards, Medians (3a, 3b, 3c): include local roadways, collector roadways and arterial roadways. This end use may include boulevards and medians with trees planted using continuous trenching (3a), trees planted without continuous trenching (3b), or on the boulevards and medians with only sod and/or shrub beds planted (3c). Continuous trenching is used to plant trees as outlined in Detail LA113 “Typical Tree Root Trench” in the latest edition of the City of Edmonton’s Design and Construction Standards. When no continuous trenching is used, trees are planted using the standard planting detail LA102. For further information on what is a local, collector, or arterial roadway, see the City of Edmonton’s “Complete Streets” Design and Construction Standards.
- 2.2.1.8. Urban Hardscapes (4a, 4b): a publicly accessible environment where by greater than 90% of the surface area is covered by some form of nonliving material (pavement, masonry, concrete, gravel etc.). This may include trees in hardscape and shrub beds which use soil cells (4a) or urban hardscapes without trees (4b).
- 2.2.1.9. Ornamental Shrub Beds (5): a shrub bed with ornamental landscaping.

- 2.2.1.10. Urban Agriculture, Community Gardens (6): land developed as flower or vegetable gardens for community use. Community gardens are operated by community organizations that determine how the venture will function (e.g., plot size, plot assignment, etc.).
- 2.2.1.11. Naturalization (excluding naturalization on SWMFs, see end use 1e) (7): a type of habitat restoration; the deliberate reintroduction of species that are native to a given area or are well adapted to the climate circumstance; activities that are intended to improve and enhance the natural environment and reduce the required operational maintenance. The biodiversity and ecosystem function of a naturalized ecosystem is lower compared to a reference habitat but higher compared to a reclaimed ecosystem.
- 2.2.1.12. Low-Impact Development (LID) – Flow Attenuation, Water Quality Treatment (8): flow attenuation and water quality treatment are the primary functions of Low- Impact Development (LID) facilities. This includes facilities where storm water flow is slowed down and reduced and the water quality of runoff is improved. This end use pertains to the incorporation of the specified topsoil mix into types of LID infrastructures that focus on increasing absorbency and filtration capacity of soil as a method of stormwater management. Note: this definition does not include SWMFs.

2.2.2. Required Chemical and Physical Properties of Topsoil

The required physical and chemical properties of the topsoil used in the different end uses are shown in Table 2, see the end of this specification for the Tables.

2.3. TOPSOIL AMENDMENTS

- 2.3.1. Topsoil amendments shall be screened and free of subsoil, sawdust, commercial wood products, stones, lumps, plants, roots, sticks, invasive and noxious plant parts and seeds per the Weed Control Act and Regulations, high seed content, chemical contaminants and other organic or inorganic materials harmful to plant life.
- 2.3.2. Topsoil amendments shall be applied if the topsoil does not meet the requirement set out in Table 2
- 2.3.3. Peat moss is temporarily approved by the City as a topsoil amendment for cited end uses. Peat has been allowed on a temporary basis as the City is no longer producing compost. The City can, at its discretion, discontinue the use of peat at any time if it is found to be having or expected to have adverse effects on vegetation or sustainability, if a suitable alternative has been found, or due to other reasons the City deems justifies the discontinuation of peat. When compost is available, compost should be used instead of peat.
- 2.3.4. Municipal sewage sludge and biosolids are not covered by this Specification.
- 2.3.5. **Organic Topsoil Amendments**

Compost shall:

- 2.3.5.1. Be commercially prepared and shall meet the CCME Guidelines for Compost Quality (2005). Compost applications shall be managed to avoid overloading soils with heavy metals.
- 2.3.5.2. Be substantially free from coliform, pathogens, and chemical or organic contaminants that may be detrimental to plant, animal or human health.
- 2.3.5.3. Meet the foreign matter and sharp foreign matter requirements (CCME 2005).
- 2.3.5.4. Not exceed a 40:1 total C:N ratio. Compost with a total C:N ratio of 25:1 to 30:1 is recommended.
- 2.3.5.5. Well rotted wood residuals when found to be a component of compost are acceptable provided the total C:N ratio for the topsoil type (mixture) shall be a maximum of 25:1 to 30:1.
- 2.3.5.6. Manure compost must meet the CCME (2005) guidelines before use as an amendment.

High-lignin Organic Material used to manufacture, or as a surface amendment for the designed topsoil mixture shall conform to the following:

- 2.3.5.7. Shall consist of bark or other plant materials with hard fibrous structure.
- 2.3.5.8. Shall have particle size of 1 mm to 15 mm, with no more than 10% under 2 mm (saw dust is not permitted).
- 2.3.5.9. pH shall range between 4.5 and 7.

2.3.6. Inorganic Topsoil Amendments

Inorganic topsoil amendments include fertilizers, sand and perlite. Vermiculite is not a recommended amendment by the City for topsoil mixtures. Vermiculite has less strength than perlite. Rapid breakdown in the soil and clogging of drainage fabric by fine vermiculite particles have been reported.

Fertilizers shall:

- 2.3.6.1. Be added to bring topsoil fertility within the ranges set out in Table 2, and as recommended by a Qualified Professional based on the topsoil testing results to determine the types, formations, and application rates.
- 2.3.6.2. Substitutions or variations in fertilizers and methods shall be approved by the Qualified Professional and the City prior to application.
- 2.3.6.3. Meet the requirements of municipal and provincial regulations and the Federal Fertilizers Act and Regulations.
- 2.3.6.4. Be in granular, pellet or pill form, dry and free flowing and have guaranteed N-P-K analysis. Liquid formations are not recommended unless approved by the City.

Sand shall:

- 2.3.6.5. Clean river pump sand or a locally available equivalent that is natural and coarse and meets the analytical specification of Table 2.

2.3.6.6. Free from impurities, clay balls, chemicals or organic matter.

Perlite shall:

2.3.6.7. Be a siliceous mineral of volcanic origin that is chemically inert, pH neutral, light-weight, sterile and odourless.

2.4. TESTING

The complete list of topsoil parameters to be analyzed are included in Table 2, and the required quantities are shown in Table 3, see the end of this specification for the Tables.

- 2.4.1. In addition to the analysis required for the topsoil parameters given in Table 2, the City can, at its discretion, also require Bulk Density analysis as part of the testing requirements for older sites for which a CCC has not been applied for in the time period required by a Servicing Agreement.
- 2.4.2. Five business days prior to topsoil testing, the Contractor or Consultant, as applicable, shall provide to the City for approval the proposed locations by email for topsoil testing. The City may request different locations within these five business days. If the City does not reply within these five business days, the proposed locations by the Contractor or Consultant, as applicable, are deemed approved.
- 2.4.3. Samples must be taken at the depths specified in Table 1 for the applicable end-use.
- 2.4.4. The Consultant or Contractor, as applicable, shall submit representative **discrete** in-situ samples of the topsoil at the time the topsoil is laid to an approved commercial laboratory (CSA/ASTM/CALA) (The Canadian Association for Laboratory Accreditation) that is ISO 17025 certified, for analysis and recommendations prior to CCC application. A copy of the report shall be submitted to the City for approval with the CCC package.
- 2.4.5. The City shall provide approval via ePlan/email to the Consultant for projects signed under a Servicing Agreement, or to written approval to the Contractor for Capital projects, of the topsoil samples. For Capital Projects, written approval shall be provided within two (2) business days. For projects with Servicing Agreements, approval via ePlan shall be provided per the timelines specified in the Servicing Agreement.
- 2.4.6. The Consultant or Contractor, as applicable, shall submit a copy of the Chain of Custody (COC) Record form to the laboratory that records all personnel responsible for handling the topsoil samples. A copy must be kept with the samples always. The City may request the COC Record at any time for review.
- 2.4.7. A copy of the analysis report, including the source and sampling locations, shall be submitted to the City with the CCC Package.
- 2.4.8. Quantities of samples required will be as per Table 3.
- 2.4.9. If the sampling report shows that the topsoil does not meet the chemical and physical requirements set out in Table 2 the City can, at its discretion, require the Developer, Consultant or Contractor, as applicable, to amend or replace the topsoil to meet the requirements.

- 2.4.10.** In the case that written approval is given by the City to the Consultant or Contractor, as applicable, the City reserves the right to conduct in-situ testing after CCC and prior to FAC on the topsoil. If these test results show the topsoil does not meet the parameters in Table 2, and that there is no reasonable wear and tear or adjacent activity that could have altered the topsoil since it was placed such that it does not meet the requirements set in Table 2, the City can, at its discretion, require the Developer, Consultant or Contractor, as applicable, to amend or replace the topsoil to meet the requirements.
- 2.4.11.** If the topsoil does not meet the depth requirements set out in Table 1, at any time prior to FAC the City can, at its discretion, require the Developer, Consultant or Contractor, as applicable, to amend or replace the topsoil to meet the requirements.

3. EXECUTION

3.1. DELIVERY, STORAGE, AND HANDLING

- 3.1.1.** Use of on-site topsoil is encouraged when it meets, or can be modified to meet, the requirements set out in Tables 1 and 2.
- 3.1.2.** If topsoil is to be stockpiled on public lands, locations must be designated by the City.
- 3.1.3.** When loading topsoil from a designated City stockpile, do not leave a vertical face.
- 3.1.4.** No soil stockpiling by the Consultant or Contractor on future Municipal Reserve lands unless written permission is granted by the City. Such permission will not be unreasonably withheld.
- 3.1.5.** For Capital Projects, five business days prior to topsoil placement, submit the as-built subgrade surveying to the City for verification of correct subsoil grades. Provide a proof of inspection by the appropriate qualified professional for verification purposes.
- 3.1.6.** Contractor and/or the Consultant, as applicable, to ensure topsoil placement near or above utilities meet the applicable standards and specifications of those utilities.
- 3.1.7.** The Contractor and/or the Consultant, as applicable, shall coordinate the placement of topsoil.

3.2. SALVAGING TOPSOIL

- 3.2.1.** Salvaging of native topsoil shall commence only after the area has been cleared of all scrub, plant material, invasive and noxious plants and their reproductive parts, grass, stumps, rocks 100 mm and over, and other extraneous organic and non-organic materials and containments.
- 3.2.2.** Strip native topsoil during site conditions that are not frozen, excessively wet, extremely dry or during dark or snowing conditions that limit visibility of the topsoil or otherwise in a condition detrimental to the work or topsoil integrity.

3.3. PLACING TOPSOIL

- 3.3.1.** For Capital Projects, the City shall approve the subgrade prior to placing topsoil and approve finished grade before the Consultant or Contractor proceeds with the next phase of work.
 - 3.3.2.** Do not place topsoil when either topsoil or subgrade is frozen, excessively wet, extremely dry, or in a condition inhibiting proper grading, cultivation, or compaction, or otherwise in a condition detrimental to the work or topsoil integrity.
 - 3.3.3.** Place topsoil in required areas to thickness, after settlement, as scheduled in Tables 1 and 2.
 - 3.3.4.** For topsoil depths greater than 300 mm, place topsoil at no greater than 150 mm lifts, excluding LID end-uses which should follow Volume 3 of the Design and Construction Standards (See LID Standards), and compact with appropriate weighted landscape roller where applicable. Landscape rollers are not recommended for naturalization areas as microtopography is recommended. Mechanical compactors including plate compactors are not permitted.
 - 3.3.5.** Obtain even surface for the topsoil and remove rocks and other foreign material greater than 50 mm in diameter, including but not limited to roots, weeds, rocks, and foreign materials.
 - 3.3.6.** Manually spread topsoil around trees and plants to prevent damage by grading and levelling equipment.
 - 3.3.7.** Placed topsoil shall be allowed to settle or shall be lightly compacted such that it is firm against deep footprints prior to planting, seeding or sodding. Compaction shall not be more than necessary to meet this requirement.
 - 3.3.8.** Fine grade to eliminate rough or low areas and to ensure positive drainage.
 - 3.3.9.** Final topsoil grades for seeded areas shall be flush to finished grade at surface structures, i.e. manholes, sidewalks and curbs.
 - 3.3.10.** For sodding, the final grade of compacted topsoil shall be 25 mm below finished grade of adjacent work such as walk, curb and manhole and 25 mm below crown of adjacent turf area.
 - 3.3.11.** For Capital Projects, the City shall approve topsoil preparation prior to seeding or sodding.
 - 3.3.12.** For environmentally sensitive areas, wetlands, or natural heritage sites where existing soil conditions are sufficient to sustain additional plantings, the Consultant may request that plantings be installed in native, undisturbed soil.
- 3.4. CLEAN-UP**
- 3.4.1.** Clean soil and debris resulting from work done under this section off roadway, walkway and surrounding areas at the end of each working day or as directed by the City.
 - 3.4.2.** Excess topsoil shall be either removed from site or spread on site if approved by the City.

END OF SECTION

Attachment B: Tables

Table 1 Topsoil Types for City of Edmonton End Uses

End Uses	Topsoil Type						Topsoil Depth (mm)				
	1	2	3	4	5	6	Sod/Seed		Shrubs/Trees		Trees
	Basic/Native Topsoil (30-60% Sand)	Standard Sports Fields (School Sites) (40-60% Sand)	High Sand, High Organic Matter (55-65% Sand)	High Organic Matter (10-15% OM)	Very High Organic Matter (15-20% OM)	Low Impact Development (LID)	200	300	450	500	900+
(1a) Parks, Playgrounds, School Sites (excluding Standard Sports Fields)	X							X	X	X	
(1b) Greenways	X							X	X	X	
(1c) Public Utility Lots	X							X	X	X	
(1d) Standard Sports Fields (School Sites)	X*	X*						X*	X*	X*	
(1e) Stormwater Management Facilities (excluding ornamental beds on SWMFs, see End Use (5))	X						300mm required for sod, seed, shrubs, and trees on SWMFs (excluding ornamental beds)				
(2a) Premier Sports Fields (Irrigated, may include Subdrainage)			X				X	X			
(2b) Premier Sports Fields (Irrigated, Subdrainage)							X	X			
(3a) Roads, Boulevards, Medians (Trees, Continuous Trench)	X								X	X	
(3b) Roads, Boulevards, Medians (Trees)	X								X	X	
(3c) Roads, Boulevards, Medians (No Trees)	X							X	X		
(4a) Urban Hardscape (Trees)**	X										X**
(4b) Urban Hardscape (No Trees)	X								X	X	
(5) Ornamental Shrub Beds				X					X	X	
(6) Urban Agriculture, Community Gardens					X				X	X	
(7) Naturalization (excluding naturalized areas on SWMFs, see End Use 1e)	X								X	X	
(8) LID (Flow Attenuation/Water Quality Treatment)						X				X***	

City of Edmonton recommends that the topsoil used in City projects relating to the Topsoil Specification meet the Alberta Tier I Soil Guidelines for metals/elements, hydrocarbons and organic compounds.

<http://aep.alberta.ca/lands-forests/land-industrial/inspections-and-compliance/documents/AlbertaTier1Guidelines-Feb02-2016A.pdf>

OM = Organic Matter

*Standard Sports Fields (School Sites) may be constructed at the same time as parks and playgrounds on the site. If the City does not pay to upgrade the field, then the developer is only obligated to use “basic soil” for the entire depth of the entire site. Based on the approved plan, either 300 mm, 450 mm or 500 mm of Basic/Native topsoil (Topsoil Type 1) will be placed. However, once the Standard Sports Field is identified, 100 mm of Standard Sports Fields topsoil (School Sites) (Topsoil Type 2) will be applied as topdressing over the Basic/Native topsoil depth, i.e., ovetop of the area designated as a sports field at the school. For example, if the Standard Sports Field has identified the requirement for 300 mm of Basic/Native topsoil (Topsoil Type 1), then 300 mm of Basic/Native topsoil (Topsoil Type 1) will be used on the entire school site and an additional 100 mm of the Standard Sports Fields topsoil (School Sites) (Topsoil Type 2) will be added ovetop of the sports field area of the school for a total depth of 400 mm, in the sports field.

If the Standard Sports Field has identified the requirement for 450 mm of Basic/Native topsoil (Topsoil Type 1), then 450 mm of Basic/Native topsoil (Topsoil Type 1) will be used on the entire school site and an additional 100 mm of the Standard Sports Fields topsoil (School Sites) (Topsoil Type 2) will be added over top of the sports field area of the school for a total depth of 550 mm, in the sports field.

** Soil volume requirements – large canopy trees require 17 m³ per tree, small canopy trees require 11 m³ per tree. Trees that do not meet this minimum soil volume will require soil cells.

***The depth may vary from this Specification as an LID facility will be designed to manage a certain amount of water based upon the specific LID facility design parameters. For example, if the facility is limited in surface area, then deeper volumes may be required to accommodate water volume.

Limitations Regarding Offsets

The City requires that offsets from infrastructure will be mandatory as deep topsoil depths cannot be constructed immediately adjacent to above and underground infrastructure. Topsoil depths greater or equal to 150 mm topsoil depths near above and underground infrastructure require the review of a geotechnical engineer or other qualified professional to determine the appropriate offsets for the deeper topsoil from the above and underground infrastructure.

Table 2 Topsoil Types and Associated Topsoil Properties Recommended for End Uses

(tolerances for minimum and maximum values: sand, silt, clay +/- 5%)

	Topsoil Type					
	1	2	3	4	5	6
END USES THAT ARE APPROPRIATE FOR SPECIFIED TOPSOIL	Basic/Native Topsoil (30-60% Sand) (1a) Parks, Storm Water Management Facilities, Playgrounds, and School Sites (excluding Standard Sports Fields) (1b) Greenways (1c) Public Utility Lots (1d) Standard Sports Fields (School Sites) (first 300 mm, 450 mm or 500 mm) (3a) Roads, Boulevards, Medians (Trees, Continuous Trench) (3b) Roads, Boulevards, Medians (Trees) (3c) Roads, Boulevards, Medians (No Trees) (4a) Urban Hardscapes (Trees) (4b) Urban Hardscapes (No Trees) (7) Naturalization	Standard Sports Fields (School Sites) (40-60% Sand) (1d) Standard Sports Fields (School Sites) (100 mm topdressing)	High Sand, High Organic Matter (55-65% Sand) (2a) Premier Sports Fields (Irrigated, may include Subdrainage)	High Organic Matter (10-15% OM) (5) Ornamental Shrub Beds	Very High Organic Matter (15-20% OM) (6) Urban Agriculture, Community Gardens	Low Impact Development (LID) (8) LID – Flow Attenuation, Water Quality Treatment
	Particle Size Distribution (%) and Textural Class					
Coarse gravel (<19 mm to 40 mm) ^A	0-3%	0-3%	0-1%	0-1%	0-1%	See Volume 3: EPCOR Drainage Design and Construction Standards
All gravel (2 mm to 40 mm) ^A	-	-	0-5%	-	-	
Very coarse sand (1 mm to 2 mm) ^A	-	-	<10% ^{B C}	-	-	
Coarse sand (0.5 mm to 1 mm) ^A	-	-	20-50% ^{B C}	-	-	
Medium sand (0.25 mm to 0.50 mm) ^A	-	-	20-50% ^{B C}	-	-	
Fine sand (0.15 mm to 0.25 mm) ^A	-	-	<20% ^{B C}	-	-	
Combined medium to very coarse sand (2 mm to 0.25 mm) ^A	-	-	>60% ^{B C}	-	-	
Combined very coarse sand, fine gravel and gravel	-	-	<25% ^{B C}	-	-	
Sand (2 mm to 0.05 mm) ^A	35-60%	40-60%	60-70% ^B	50-70%	40-75%	
Silt (0.05 mm to 2 µm) ^A	15-50%	15-50%	<=20%	10-25%	10-30%	
Clay (<2 µm) ^A	15-30%	15-30%	<=20%	0-25%	0-30%	
Clay and silt combined	Maximum 65%	Maximum 60%	Maximum 40% ^{B C}	Maximum 50%	Maximum 60%	

Textural Class ^A	Loam ^E , Sandy loam ^E , Silt loam ^E , Sandy clay loam ^E	Loam ^E , Sandy loam ^E , Silt loam ^E , Sandy clay loam ^E	Sandy loam ^E	Sandy loam ^E to Loam ^E	Sandy loam ^E to Loam ^E
Organic matter content %	4-10% ^F	4-10% ^F	6-8% ^{BC}	10-15%	15-20%
Additional Topsoil Properties					
pH (acidity) (Saturated paste)	6.0-7.5 ^A	6.0-7.5 ^A	6.0-7.5 ^A	6.0-7.5 ^A	6.0-7.5 ^A
EC dS/m (salinity)	<2 ^G	<2 ^G	<2 ^{BG}	<4	<2 ^G
SAR (sodicity)	-	-	-	<4	-

	Topsoil Type					
	1	2	3	4	5	6
END USES THAT ARE APPROPRIATE FOR SPECIFIED TOPSOIL	Basic/Native Topsoil (30-60% Sand) (1a) Parks, Storm Water Management Facilities , Playgrounds, and School Sites (excluding Standard Sports Fields) (1b) Greenways (1c) Public Utility Lots (1d) Standard Sports Fields (School Sites) (first 300 mm, 450 mm or 500 mm) (3a) Roads, Boulevards, Medians (Trees, Continuous Trench) (3b) Roads, Boulevards, Medians (Trees) (3c) Roads, Boulevards, Medians (No Trees) (4a) Urban Hardscapes (Trees) (4b) Urban Hardscapes (No Trees) (7) Naturalization	Standard Sports Fields (School Sites) (40-60% Sand) (1d) Standard Sports Fields (School Sites) (100 mm topdressing)	High Sand, High Organic Matter (55-65% Sand) (2a) Premier Sports Fields (Irrigated, may include Subdrainage)	High Organic Matter (10-15% OM) (5) Ornamental Shrub Beds	Very High Organic Matter (15-20% OM) (6) Urban Agriculture, Community Gardens	Low Impact Development (LID) (8) LID – Flow Attenuation, Water Quality Treatment
Available Phosphorus	20 mg/kg to 60 mg/kg (or as per site requirements) ^{JK}	20 mg/kg to 60 mg/kg (or as per site requirements) ^{JK}	20 mg/kg to 60 mg/kg (or as per site requirements) ^{JK}	20 mg/kg to 60 mg/kg (or as per site requirements) ^{JK}	20 mg/kg to 60 mg/kg (or as per site requirements) ^{JK}	See Volume 3: EPCOR Drainage Design and Construction Standards
Total Phosphorus	NA	NA	NA	NA	NA	
Available Potassium	300 kg/ha to 1000 kg/ha (or as per site requirements) ^L	300 kg/ha to 1000 kg/ha (or as per site requirements) ^L	300 kg/ha to 1000 kg/ha (or as per site requirements) ^L	300 kg/ha to 1000 kg/ha (or as per site requirements) ^L	300 kg/ha to 1000 kg/ha (or as per site requirements) ^L	

Notes:

City of Edmonton recommends that the topsoil used in City projects relating to the Topsoil Specification meet the Alberta Tier I Soil Guidelines for metals/elements, hydrocarbons and organic compounds.

<http://aep.alberta.ca/lands-forests/land-industrial/inspections-and-compliance/documents/AlbertaTier1Guidelines-Feb02-2016A.pdf>

OM = Organic Matter; LID = Low Impact Development; NA = not applicable/not

^A Soil Classification Working Group (1998) <http://sis.agr.gc.ca/cansis/taxa/cssc3/index.html>

^B ASTM (2016) <https://www.astm.org/Standards/F2396.htm>

^C USGA (2004) <https://www.usga.org/content/dam/usga/images/course-care/2004%20USGA%20Recommendations%20For%20a%20Method%20of%20Putting%20Green%20Cons.pdf>

^D City of Edmonton, LID BMP (2014) https://www.edmonton.ca/city_government/documents/PDF/LIDGuide.pdf

^E Bowser et al. (1962) [http://www1.agric.gov.ab.ca/\\$department/deptdocs.nsf/all/sag14932](http://www1.agric.gov.ab.ca/$department/deptdocs.nsf/all/sag14932). There are topsoil types around Edmonton that have heavier textures such as silty clay (SiC), silty clay loam (SiCL), and clay loam (CL) but are unsuitable for the Topsoil Specification (2017).

^F AAF (2003) [http://www1.agric.gov.ab.ca/\\$department/deptdocs.nsf/all/aesa1861](http://www1.agric.gov.ab.ca/$department/deptdocs.nsf/all/aesa1861)

g AEP (2016) (AB Tier I, coarse textured, agriculture) <http://aep.alberta.ca/lands-forests/land-industrial/inspections-and-compliance/documents/AlbertaTier1Guidelines-Feb02-2016A.pdf>

h Estimated based on organic matter % and texture

i AAFRD (1987) sta [http://www1.agric.gov.ab.ca/\\$department/deptdocs.nsf/all/sag9469/\\$FILE/sq_criteria_relative_to_disturbance_reclamation.pdf](http://www1.agric.gov.ab.ca/$department/deptdocs.nsf/all/sag9469/$FILE/sq_criteria_relative_to_disturbance_reclamation.pdf)

j BCSLA and BCLNA (2012) http://www.bcsla.org/sites/default/files/PREVIEW%20Pages%20from%20Landscape_Standard_2012_Updated%20October%2015%2C%202013.pdf

k Paterson et al. (2006) [http://www1.agric.gov.ab.ca/\\$department/deptdocs.nsf/all/sag11864/\\$FILE/vol-1-summary.pdf](http://www1.agric.gov.ab.ca/$department/deptdocs.nsf/all/sag11864/$FILE/vol-1-summary.pdf)

l AAF (2013) [http://www1.agric.gov.ab.ca/\\$department/deptdocs.nsf/all/agdex917](http://www1.agric.gov.ab.ca/$department/deptdocs.nsf/all/agdex917)

Table 3 Topsoil Testing Quantities Per End Use

Example:

1. 2.7 ha parksite Topsoil Type 1, number of samples required:

Minimum of 8 samples + (1 sample per 0.5 ha increment * 1 increment of 0.5 ha) = 9 samples in total

2. 700 m² ornamental shrub bed Topsoil Type 4:

Minimum of 5 samples + (1 sample per 0.3 m² increment * 0 increments of 0.3 m²) = 5 samples in total

Topsoil Type	Minimum Area	Maximum Area	Minimum number of Samples	Required Sample Rate (samples/ha)
1	<0.1 ha	1 ha	1	1 sample per 0.2 ha increments from 0 ha
	>1 ha	2 ha	5	1 sample per 0.33 ha increments from 1 ha
	>2 ha	5 ha	8	1 sample per 0.5 ha increments from 2 ha
	>5 ha	∞ ha	14	1 sample per 1 ha increments from 5 ha
2 and 3	4 samples per sports field			
4 and 5	<1 m ²	500 m ²	1	1 sample per 100 m ²
	>500 m ²	2000 m ²	5	1 sample per 300 m ²
	>2000 m ²	∞ m ²	10	1 sample per 500 m ²
6	<1 m ²	600 m ²	2	1 sample per 200 m ²
	>600 m ²	2000 m ²	3	1 sample per 400 m ²
	>2000 m ²	∞ m ²	4	1 sample per 600 m ²

1. GENERAL**1.1. SCOPE**

Supplying materials, wood chip mulch, bark chip mulch, maintenance and inspections.

1.2. RELATED SECTIONS

Trees, Shrubs and Ground Covers Section 02930

1.3. PRODUCT DELIVERY, HANDLING and STORAGE

1.3.1. Supply mulch as specified on approved landscape drawings and specifications.

1.3.2. Protect mulch stockpile on site from contamination of airborne herbicides, pesticides, fertilizers and other hazardous chemicals.

1.3.3. Avoid the placement of mulches in excessively wet conditions or when the ground is frozen.

1.3.4. All organic mulches shall be generally free of diseases, moulds, fungi and insect infestations.

1.3.5. All organic mulches shall be free of inorganic materials such as metal, glass, rock and other foreign materials.

1.4. SUBSTITUTION

All mulches shall be supplied and installed as specified. Substitutions will not be allowed unless approved by the City.

1.5. INSPECTION

The City will inspect all mulches prior to installation. The Contractor must provide a mulch sample to the City for approval prior to site installations.

2. PRODUCTS**2.1. BARK WOOD MULCH**

Mature bark of coniferous trees, cedar, pine, redwood, fir chipped to sizes ranging from 40 mm to 60 mm.

2.2. CONIFEROUS WOOD CHIP MULCH

Chipped trees, mulch containing bark, wood and needles. Maximum chipped sizes 50 mm to 100 mm. Free of non-organic materials, wood preservatives or diseased wood. For use on trails or pathways, picnic sites as surface cover and on planting beds containing acid loving plants such as azaleas, conifers and rhododendrons. Coniferous wood chip mulch is NOT for use in shrub beds, except as designated in this paragraph.

2.3. DECIDUOUS WOOD CHIP MULCH

Chipped ash, elm, maple, poplar, birch and other deciduous trees. Mulch containing bark, wood and leaves (in summer) chipped to sizes ranging from 50 mm to 100 mm. Mulch may contain stringy twigs and seed, free of non-organic material, wood preservatives or diseased wood. Contains no more than 5% of the following materials in total: soil, sawdust, peat moss, coniferous wood and needles.

2.4. SOFTWOOD LUMBER CHIPS

Lumber, pallets and shingles chipped to a maximum size of 100 mm long x 5 mm thick & 40 mm wide. Free of all chemicals such as wood preservatives, paints, glues etc. Free of foreign materials such as nails, bolts, drywall or other refuse. No more than 5% soil and or sawdust.

2.5. PROHIBITED MULCHES

The following mulches are prohibited: rock, gravel, stone, shale, sawdust, shavings, peat moss, manures or raw composts, paper products, plastics, rubbers, aluminium foils, gelatinous sprays, plywoods and other lumbers containing chemical adhesives or wood preservatives.

3. EXECUTION**3.1. INSTALLATION**

- 3.1.1.** 100mm depth of wood chip mulch must be maintained to edge of planting bed for ornamental beds.
- 3.1.2.** 25mm to 50mm of wood chip mulch must be maintained to edge of planting bed for naturalized beds.
- 3.1.3.** All mulches to be installed during active growing season. Water plants prior to applying mulch.
- 3.1.4.** During application all mulches shall be kept at least 50 mm to 75 mm away from tree trunks and shrubs.

3.2. PREPARATION

- 3.2.1.** Remove all weeds and debris from area of installation.
- 3.2.2.** A weed liner shall accompany organic mulches when designated on the Contract drawings.

3.3. CLEAN-UP

Clean roadway, walkway and surrounding turf of mulches and other debris caused by work under this Section at the end of each working day or as directed by the City.

3.4. MAINTENANCE

Spot control of weeds and seedling growth twice per year or as may be necessary. All mulched areas to be weed free during Construction Completion Certificate and Final Acceptance Certificate inspections

END OF SECTION

1. GENERAL

- 1.1** All “T” or “U” bar tree stakes will have the top 300 mm painted the appropriate colour code according to year planted. Colour coding of tree stakes is required for all trees to be maintained by the City.

YEAR	COLOUR
2012	Blue
2013	White
2014	Yellow
2015	Green
2016	Blue
2017	White
2018	Yellow
2019	Green
2020	Blue
2021	White
2022	Yellow

END OF SECTION

1. GENERAL

1.1. SCOPE

Supplying materials, seeding, sodding, fertilizing, watering, mulching, maintenance and inspection.

1.2. RELATED SECTIONS

Topsoil.	Section 02910
Trees, Shrubs and Ground Covers.	Section 02930

1.3. DEFINITIONS

Weeds: Includes but not limited to dandelions, jimsonweed, quack grass, horsetail, morning glory, rush grass, mustard, lambsquarter, chickweed, crabgrass, Canadian thistle, tansy, ragwort, bermuda grass, bindweed, bent grass, perennial sorrel, brome grass, red root, pigweed, buckweed, scentless chamomile, toadflax, foxtail and perennial sow thistle.

Ecosite: a distinctive kind of land with specific physical characteristics that differs from other kinds of land in its ability to produce a distinctive kind and amount vegetation.

1.4. PRODUCT DELIVER, STORAGE AND HANDLING

1.4.1. Deliver grass seed in the original containers, tagged with identification as to the analysis of seed mixture, percentages of seed, year of seed production, net weight and date.

1.4.2. Deliver seed to site only when required.

1.4.3. Protect sod during transportation with tarpaulin to prevent sun scalding and drying out and to ensure its arrival at the site in a healthy condition.

1.4.4. Sod must be installed on the day of arrival at site. If delays in installation occur due to weather, protect sod on site from sun, keep sod moist and store in a cool place until installation. Sod that is dried out and not in a healthy growing condition will be rejected.

1.5. SUBSTITUTION

The City will review all requests by the Contractor for substitution of seed mixes.

1.6. INSPECTION

1.6.1. The City may require a seed germination test and all lawn seed must comply with Federal and Provincial seed laws. Germination test to be co-ordinated by the Contractor and the seed supplier.

1.6.2. Inspection of sod at source of supply, at the site or during the course of construction will not impair the right of the City to reject sod which has been damaged or which, in any way, does not conform to the specifications.

1.6.3. The City will inspect all seed and sod installations.

1.6.4. Remove all rejected materials from site immediately.

2. PRODUCTS

2.1. SEED MIXTURE

Certified Canada No. 1 mixture, free of disease, weed seeds or foreign matter, minimum germination of 75%, minimum purity of 97% and conforming to the mixes below or approved alternatives. All seed must be from a recognized seed firm, meeting the requirements for the Seeds act for Canada No. 1 Seed. Seed shall be certified No. 1 grade. A germination test and/or weed seed analysis may be requested and all lawn seed must comply with federal and provincial seed laws.

2.1.1. For standard roadway landscaping and steep slopes “Canada #1 Mix”:

- 30% Argyll Kentucky Bluegrass
- 30% Kentucky Bluegrass
- 30% Creeping Red Fescue
- 10% Annual Rye Grass

2.1.2. For rehabilitation of existing turf area “Parks Maintenance #1 Mix”:

- 30% Touchdown Kentucky Bluegrass
- 20% Banff Kentucky Bluegrass
- 30% Creeping Red Fescue
- 20% Fiesta II Perennial Rye Grass

2.1.3. Native and Naturalization Seed Mixes:

- 2.1.3.1. For non-maintained naturalized areas, or natural areas undergoing restoration, use native or naturalized seed mixes based on the ecosite or environmental conditions for the area. Examples of appropriate seed mixes to the Parkland Region are listed below. Percentages can range +/- 5%.
- 2.1.3.2. If mixes do not already contain a nurse crop or nitrogen fixer, adjust mixes to include 5-10% of a native nitrogen fixing species from the following choices: Purple Prairie Clover (*Dalea purpureum* var. *purpureum*), Canada Milkvetch (*Astragalus canadensis*), or American Vetch (*Vicia Americana*). Species chosen must be appropriate for site environment and intended result (e.g. slope stabilization).
- 2.1.3.3. Native seed mixes are used for habitat restoration (see Section 3.3.21) to fully re-establish a target level of ecosystem function and biodiversity as defined by the reference habitat. Native grass species can also be used when establishing landscapes with a natural aesthetic. Applicable for the following site types where restoration is determined to be the appropriate approach:
 - Parkland natural area restoration;
 - Ravine or river valley restoration;
 - Disturbed sites that are surrounded by natural areas or native reference vegetation areas (Examples: Roadways, buffers, boulevards, culverts).

2.1.3.4. Native Seed Mix – Peace River Parkland

35% Awned Wheatgrass (*Agropyron trachycaulum* var. *unilaterale*);
15% Rocky Mountain Fescue (*Festuca saximontana*);
15% Western Wheatgrass (*Agropyron smithii*);
5% Junegrass (*Koeleria macrantha*);
5% Western Porcupine grass (*Stipa spartea*);
25% Slender Wheatgrass (*Agropyron trachycaulum* var. *trachycaulum*).

2.1.3.5. Native Seed Mix - Central Parkland

15% Awned Wheatgrass (*Agropyron trachycaulum* var. *unilaterale*);
15% Slender Wheatgrass (*Agropyron trachycaulum* var. *trachycaulum*);
15% Western Wheatgrass (*Agropyron smithii*);
5% Sloughgrass (*Beckmannia syzigachne*);
5% Idaho Fescue (*Festuca idahoensis*);
5% Alkali Bluegrass (*Poa secunda* ssp. *juncifolia*);
5% Junegrass (*Koeleria macrantha*);
5% Sandberg Bluegrass (*Poa secunda*);
20% Green Needlegrass (*Stipa viridula*);
10% Rocky Mountain Fescue (*Festuca saximontana*).

2.1.3.6. Naturalization Seed Mixes

The following seed mixes are examples of seed mixes that can be used when establishing a naturalized aesthetic in parks or open spaces, or for a particular ecological function.

Naturalization seed mixes are suitable for habitat restoration (see Section 3.3.22) as Naturalization is a type of restoration that involves the deliberate reintroduction of species that are native to a given area or are well adapted to the climate circumstance, and activities that are intended to improve and enhance the natural environment. The biodiversity and ecosystem function of a naturalized ecosystem is lower compared to a reference habitat but higher compared to a reclaimed ecosystem.

Naturalization seed mixes are also suitable for reclamation (see Section 3.3.23), which is a type of habitat restoration that aims to stabilize disturbed lands to an ecologically productive use. A reclaimed ecosystem has less biodiversity and ecosystem function compared to a reference habitat, and the least compared to other types of habitat restoration.

Specific site recommendations:

- Bioswales;
- Stormwater Management Facilities (SWMF);
- Non-programmable spaces in utility corridors;
- Banks and erosion control;
- Parkland.

2.1.3.7. **Non-Maintained Naturalization Landscaping - Wet meadow Seed Mix**

10% Awned Wheatgrass (*Agropyron trachycaulum* var. *unilaterale*);
10% Western Wheatgrass (*Agropyron smithii*);
10% Sloughgrass (*Beckmannia syzigachne*);
20% Tufted Hair Grass (*Deschampsia caespitosa*);
15% Giant Wild Rye (*Elymus piperi* syn. *Cinereus*);
30% Fowl Bluegrass (*Poa palustris*);
5% Annual Ryegrass (*Lolium multiflorum*).

2.1.3.8. **Non-Maintained Naturalization Landscaping - Dry meadow seed mix**

20% Junegrass (*Koeleria macrantha*);
20% Rough Fescue (*Festuca campestris*);
10% Green Needlegrass (*Stipa viridula*);
15% Streambank Wheatgrass (*Agropyron riparium*);
20% Northern Wheatgrass (*Agropyron dasystachyum*);
10% Sheeps Fescue (*Festuca ovina*);
5% Annual Ryegrass (*Lolium multiflorum*).

2.1.3.9. **Non-Maintained Naturalization Landscaping - Grassland Wet Seed Mix**

For use in areas that experience spring flooding followed by dry conditions as the spring and summer progress.

20% Northern Wheatgrass (*Agropyron dasystachyum*);
20% Slender Wheatgrass (*Agropyron trachycaulum* var. *trachycaulum*);
20% Nodding Bromegrass (*Bromus anomalus*);
5% Tufted Hair Grass (*Deschampsia caespitosa*);
5% Tickle Grass (*Agrostis scabra*);
10% Sloughgrass (*Beckmannia syzigachne*);
10% Alkali Bluegrass (*Poa secunda* ssp. *juncifolia*);
10% Annual Ryegrass (*Lolium multiflorum*).

2.1.3.10. **Wildflower Seed Mix**

Wildflower mixes should be appropriate to the region and a species list included in the planting plan (with scientific and common names).

2.1.3.11. **Alternates**

The Landscape Architect may recommend alternates to the above seed mixes which shall be identified within the scope of work and on plan prior to approval of drawings. Both common and scientific names should be listed on the planting plan. The use of non-regulated, non-native plants may be appropriate in situations where the area being revegetated is in the middle of an area already seeded to the same species.

2.2. SOD

Certified No. 1 cultivated turf sod; with strong fibrous root system, thick and healthy growth and delivered 24 hours from the time of cutting. Sod showing signs of deterioration due to age or lack of moisture will be rejected. Sod must be free of stones, burns, dry or bare spots, tears and delivered moist, cut in strips of uniform width and thickness and of the following mix or approved equal:

70-90% Kentucky Bluegrass

0-10% Creeping Red Fescue

0-30% Perennial Ryegrass

2.2.1. All mesh must be removed prior to installation of sod.

2.3. BINDER

2.3.1. Use Turfmaster Hydro Seal or equivalent compatible binder additive at the manufacturer's recommended rate, sufficient to mix a consistent slurry.

2.3.2. Binder shall be mixed and supplied by a recognized supplier and shall have tested rates of purity.

2.4. MULCH

2.4.1. Material shall be wood cellulose fibre containing no contaminants.

2.4.2. Fibre shall be supplied by a recognized supplier and shall have a certified weight and composition.

2.4.3. Minimum application rate is 16.0 kg of air dry fibre per 100 m².

2.4.4. Fibre shall be measured as it is fed into the seeder.

2.5. FERTILIZER

2.5.1. Use standard commercial fertilizers, with guaranteed chemical analysis.

2.5.2. Fertilizers shall be clearly labelled and furnished in unopened moisture-proof containers.

2.5.3. Fertilizer requirements are:

Type 1 – Rate 3.5 kg/100 m²

19% Total Nitrogen

19% Available Phosphoric Acid

19% Potash

Type 2 – Rate 3.5 kg/100 m²

10% Total Nitrogen

30% Available Phosphoric Acid

10% Potash

Type 3 – Rate 3.5 kg/100 m²

12% Ammonia

51% Phosphate

0% Sulphate

2.5.4. Fertilizer shall be granular water-soluble type.

2.5.5. The City may order changes to the fertilizer feed rates above if an analysis of the topsoil shows this to be necessary.

2.6. WATER

Clean and free of any substance that may inhibit vigorous growth of grass.

2.7. EQUIPMENT

2.7.1. Cultivators: capable of scarifying, discing or harrowing.

2.7.2. Dry Seeders: of the “Brillion” type, capable of rolling and covering the seed with 3 mm to 6 mm of soil; or of the cyclone type, with flexible wire mat drag.

2.7.3. Hydro Seeders: capable of thoroughly mixing water, seed, fertilizer and pulverized wood fibre and of uniformly spraying the mix at designated rate.

2.7.4. Rollers: of suitable size and mass.

3. EXECUTION

3.1. PLANTING SEASON

3.1.1. Grass Seeding: Recommended season May 1 to September 15. On roadways, seed must be sown by July 15 to give it time to establish for the next season, before spring sweeping.

3.1.2. Sod Laying Recommended season May 1 to September 30. On roadways, sod must be laid by July 15 to give it time to establish for the next season, before spring sweeping.

3.2. PREPARATION

- 3.2.1. Remove weeds and debris from topsoil already in place.
- 3.2.2. Firm sod-bed by rolling before application.
- 3.2.3. Examine the site, verify the grades and check that the topsoil has been placed as specified.
- 3.2.4. The work shall be done in calm weather, during the normal planting season for the type of seed mixture supplied.
- 3.2.5. Notify the City prior to the start of seeding operations.
- 3.2.6. Cultivate existing topsoil and apply additional topsoil as required to obtain minimum required depths of topsoil. Additional topsoil shall be spread evenly and lightly compacted.
- 3.2.7. Apply fertilizer according to manufacturer's instructions or as directed by the City.
- 3.2.8. Apply fertilizer with spreader at designated rate and mix thoroughly into the upper portions of topsoil.
- 3.2.9. Float and level out the finished topsoil surface.

3.3. MECHANICAL SEEDING

- 3.3.1. Do not seed when prepared topsoil is covered with frost, snow or standing water. Proceed with seeding operations only during favourable weather conditions in accordance with sound horticultural practices.
- 3.3.2. Slopes flatter than 3 Horizontal to 1 Vertical: Apply seed by mechanical dry spread (Brillion or Cyclone type) at a rate of 24 kg/1,000 m². Apply in two passes, each pass at a rate of 12 kg/1,000 m² at 90 degrees to each other. Lightly roll seeded area.
- 3.3.3. Hand broadcast seeding is unacceptable under any conditions except for site specific repair work and pre-approved work in naturalization areas.
- 3.3.4. Spread type 3 fertilizer evenly at the rate specified.
- 3.3.5. Thoroughly harrow the site after fertilizing, on ground flatter than 3 Horizontal to 1 Vertical.
- 3.3.6. Sow the seed at the rate specified for the seed type, in 2 directions, 50% in one direction and remaining 50% of seed at right angles to first seeding pattern.

3.4. HYDRO SEEDING

- 3.4.1. Use a hydro seeder to seed slopes steeper than 3 horizontal to 1 vertical with Parks Naturalization Mix as in Clause 2.1.3.6. In other flatter areas use Canada #1 Mix as in Clause 2.1.1. All as specified on the landscape drawings and in the scope of work.
- 3.4.2. Mix seed with water, mulch and fertilizer in the following suggested quantities to cover 4,000 m².

Grass Seed:	80 kgs	Mulch:	640 kgs
Water:	6,400 litres	Fertilizer:	140 kgs

3.4.3. Hydro seeding should not be carried out in wind velocities which cause seed mix to be blown. The City to determine if conditions are appropriate for application

3.4.4. Measure quantities of materials to be fed into the seeder, either by weight or by using another approved system.

3.4.5. Application rates:

Grass seeds 2.0 kg per 100 m² or as specified for the seed type.

Water 106 L/100 m².

Mulch 16 kg/100 m² or sufficient to apply the specified amount of seed and fertilizer per 100 m².

Use type 3 fertilizer.

3.4.6. Thoroughly mix seed, fertilizer, mulch, binder (if specified) and water in a slurry and uniformly apply in one operation of apply seed and fertilizer mixture then cover with an approved mulch.

3.5. SEED GERMINATION, DRY SEED AND HYDRO-SEED APPLICATIONS

3.5.1. If seed fails to germinate within four growing months, re-cultivate and re-seed until germination takes place.

3.5.2. Approximately six weeks after germination apply supplementary fertilizer 27-14-0, at a rate determined by topsoil analysis or such other fertilizer as may be deemed appropriate by the City.

3.6. CUTTING SOD

3.6.1. Cut sod by approved methods in accordance with the recommendations of the Canadian Standards for Nursery Stock by the Canadian Nursery Landscape Association (C.N.L.A.).

3.6.2. When abutting an existing turfed area, cut the existing turf so as to form a straight or non-jagged joint with the new seeded or sodded area.

3.6.3. Handle sod carefully when loading and installing to prevent tearing or breaking.

3.7. SODDING ON SLOPES FLATTER THAN 3 HORIZONTAL TO 1 VERTICAL

3.7.1. Lay sod evenly in staggered row, with edges and ends butted tightly. Blend edges of sod with existing grass or cultivated areas. Reference detail LA300.

3.7.2. Where sod butt joins surface paving, i.e. manhole, sidewalk or curb, position sod turf crown flush with finished hard surface so turf is level with surface.

3.7.3. Top dress seams as required with No. 1 mix topsoil. Water the sod and upper 100 mm of topsoil with water spray. Do not cause erosion.

3.7.4. Let sod and soil dry out sufficiently to prevent damage, then roll sod with a roller to ensure good bond between sod and soil and to smooth out humps and depressions.

3.7.5. Immediately after rolling, saturate sod and upper 100 mm of soil with fine spray. To prevent grass and soil from drying out, continue adequate watering for 8 to 10 days after laying or until roots are well established.

- 3.7.6.** Four weeks after laying and following initial cutting apply organic supplementary fertilizer 27-14-0, at a rate determined by topsoil analysis or such other fertilizer as may be determined by the City.
- 3.7.7.** No sod is permitted on slopes 3:1 or steeper.

3.8. WARRANTY

- 3.8.1.** All grass either seeded or sodded shall have a one-year warranty period from issuance of the Construction Completion Certificate.
- 3.8.2.** Areas showing deterioration, bare spots or thin areas, or are not level with the adjacent hard surface, shall be re-seeded or re-sodded at the Contractor's expense.

3.9. MAINTENANCE

- 3.9.1.** Maintenance shall include all measures necessary to establish and maintain seeded and sodded areas in an acceptable, vigorous and healthy growing condition. The maintenance will be from a period of one year from the issuance of a Construction Completion Certificate and until the issuance of the Final Acceptance Certificate. Maintenance shall include:

- Mowing at regular intervals to maintain a minimum height of 60 mm and a maximum height of 75 mm. Do not cut more than 1/3 of blade height at any one mowing. Remove heavy clippings immediately.
- Replacing areas that show root growth failure, deterioration, bare or thin spots or which have been damaged by any means.
- Removing and replacing dead sod.
- Top dressing and rolling to repair ruts or erosion.
- The City may direct the use of herbicides for weed control. They shall be applied in accordance with manufacturer's recommendations by a licensed applicator. Damage resulting from the Contractor's improper use of herbicides shall be remedied at the Contractor's own expense. The developer must keep the areas free of weeds between CCC and FAC.

3.10. FINAL INSPECTION

- 3.10.1.** Final inspection of seeded or sodded areas will be made prior to the end of the warranty period.
- 3.10.2.** At the time of inspection all the areas shall be alive and in a healthy satisfactory growing condition and free from weeds.
- 3.10.3.** Laydown areas must be restored to the satisfaction of the City prior to the end of the warranty period.

3.11. CLEAN-UP

- 3.11.1.** Clean roadway, walkway and surrounding areas of soil, seed, clippings and other debris resulting from work done under this section at the end of each working day or as directed by the City.

END OF SECTION

1.4.10 Upon arrival all plant material that cannot be planted during the current day's operations shall be heeled with topsoil or mulch and watered. All plant material should be planted within 24 hours of delivery to site.

1.4.11 Root balls, roots, trunks, branches and leaves shall be protected on site from drying, frost, construction equipment, or other damage and be kept moist until planted.

1.4.12 Replacement of all damaged stock is at the Contractor's expense.

1.4.13 Subgrade material from the digging of tree pits by a tree spade is to be removed from the site at the Contractor's expense if it cannot be utilized on site.

1.5 SUBSTITUTION

1.5.1 All substitutions shall be made through a change order to the contract.

1.5.2 All requests for substitutions shall be vetted through the Landscape Architect responsible for preparing the contract drawings. Such requests shall be forwarded to the City for approval.

1.5.3 Requests for substitution of plants larger than specified may require submission of revised contract drawings by the Landscape Architect for approval by the City.

1.6 INSPECTION

1.6.1 Prior to the commencement of installation plant materials may be inspected and approved either at the source of local supply or on site at the discretion of the City. Previous joint approval will not impair the right of the City during the course of construction to reject plants which have been damaged or which, in any way, do not conform to the specifications. Any rejected plant materials will be noted on a site instruction form and presented to the contractor for follow-up.

1.6.2 The consultant must request an inspection with the City Landscape Inspector 48 hours prior to tree root trenching. The consultant is encouraged to take pictures during the tree root trenching.

2. PRODUCTS

2.1 PLANT MATERIAL

2.1.1 All plant materials shall meet the horticultural standards of and comply with, all sections of the latest edition of Canadian Nursery Landscape Association (C.N.L.A.) planting specifications.

2.1.2 They shall be nursery grown, under proper cultural practices as recommended by the C.N.L.A.

2.1.3 Any plants dug from native stands, wood lots, orchards, or neglected nurseries and have not received proper cultural maintenance as advocated by the C.N.L.A., shall be designated as "collected plants".

2.1.4 The use of "collected" plants will not be permitted unless previously inspected and approved in writing by the City.

2.1.5 Within reason, plants shall be generally true to type and structurally sound, well branched, healthy, show acceptable vitality, and be free of disease, insect infestations, insect eggs, rodent damage, sunscald, frost cracks and mechanical wounds. They shall be densely foliated when in leaf and have a healthy,

well-developed root system. Pruning cuts shall show vigorous bark on all edges and all parts shall be moist and show live, green cambium tissue when cut.

- 2.1.6 Trees shall have straight trunks with a well-developed single (or central) leader. Minor adjustments of structural integrity may be attempted by structural pruning carried out by or directly supervised by a certified professional (ISA Certified Arborist, Landscape Industry Certified Technician, Landscape Horticulturist (Red Seal or LGAP) or equivalent designation and will be subject to re-inspection. Clump or multi-stem trees shall have three or more stems originating from a common base.
- 2.1.7 Shrubs shall have natural form typical of the species with a minimum of four canes.
- 2.1.8 Vines shall have at least four runners, each of a minimum length of 300 mm.
- 2.1.9 Ground covers shall have well-developed tops, size proportionate to the developed roots typical of the species.
- 2.1.10 Perennial plants to be of vigorous growth with healthy leaf and stem tissue and without sign of wilting. All plants to be full-form without missing or broken branches and of a shape typical of the particular species.
- 2.1.11 Plants that have been top-worked, sheared, or colour treated are not acceptable.
- 2.1.12 All plant materials shall conform to the measurements specified on the plant list on the approved landscape drawings except that plants larger than specified may be used if approved by the City. If larger plants are used, the root ball shall be increased in proportion to the size of the plant as per Section 02930 – Trees, Shrubs and Ground Cover; Clause 3.4.4. Ground cover plants shall have healthy tops to a size proportionate to the above root requirements typical of the species.

2.2 CONIFEROUS TREES

- 2.2.1 All trees shall be suitable for immediate planting and be of normal shape and quality for the species. Trees with broken or missing leaders will not be accepted.
- 2.2.2 Spruce varieties shall have uniform branching which starts no higher than 300 mm from the root collar. On Pine varieties, branching shall be no higher than 600 mm from the root collar.
- 2.2.3 The root balls shall contain all the original soil in which the tree has grown and shall be free of all weeds and vegetation. It shall be firmly wrapped in burlap and secured to prevent any soil from spilling or drying out. Any increase or decrease in tree size shall require a corresponding adjustment to the root ball size to conform to C.N.L.A., Canadian Standards for Nursery Stock.

2.3 DECIDUOUS TREES

- 2.3.1 All trees are to be suitable for planting as street trees and should show signs of good trunk taper and free of branches to a point not less than 60% of tree height.
- 2.3.2 All bare root trees shall have a heavy fibrous root system that has been developed by proper cultural treatment, such as transplanting or root pruning and shall have a spread not less than specified.

2.3.3 The root ball shall contain all the original soil in which the tree has grown and shall be free of all weeds and vegetation. It shall be firmly wrapped in burlap and secured to prevent any soil from spilling or drying out. Any increase or decrease in tree size shall require a corresponding adjustment to the root ball size to conform to C.N.L.A., Canadian Standards for Nursery Stock.

2.3.4 Trees collected from native stands or established plantings must be so designated. Root balls shall be at least ten percent larger in diameter than Nursery grown stock.

2.3.5 All trunks shall be straight, clean and free from stubs and portions of decay, splits, or other damage.

2.4 OTHER MATERIAL

- Wire Basket
- Burlap
- Guy Wires
- Tree Anchors
- Tree Stakes
- Weed Liner
- Tree Grates and Guards
- Rodent Protection

3. EXECUTION

3.1 PLANTING SEASON

Plant trees, shrubs and ground covers only during periods that is normal for such work. It is recommended that all coniferous material should be planted suggested planting in spring season only.

3.2 SITE PREPARATION

3.2.1 All rough grading, excavating work for planting beds and the preparation of subgrades, which are to receive planting soil mixture shall be as described below.

3.2.2 Dig out the tree root holes/pits, planting beds and shrub root holes and remove excess soil off site or as directed by the City.

3.3 PLANTING TOPSOILS

Soil mixes shall be as shown on standard details and as specified by Section 02910 - Topsoil.

3.4 DIGGING OF PLANTS

3.4.1 Immediately after digging all plants, the root system shall be kept moist to prevent drying out until planted.

3.4.2 Plants specified “Bare Root” shall be dug and moved while dormant, with the major portion of the fibrous root system provided.

3.4.3 All plants specified as “Balled and Burlapped” shall be dug and moved while dormant unless directed otherwise by the City, with the major portion of the fibrous root system provided.

3.4.4 Ball sizes shall be sufficiently large to contain at least 75% of the fibrous root depth. The sizes of root balls for trees shall be as specified in the Canadian Standards for Nursery Stock from C.N.L.A. Ball sizes are a minimum and shall be adjusted according to growth habits of plants.

3.4.5 Ball sizes for coniferous trees to be:

Tree Height Range	Ball Diameter
1.8m (6') - 2.4m (8')	86 cm (34")
2.5m (8') - 3.0m (10')	100 cm (40")
3.1m (10') - 3.5m (12')	122 cm (48")

Note: All pines to have oversized minimum root ball diameter (for trees 2.5 m height) of 1150 mm (3'10").

3.4.6 Wrap root balls as per C.N.L.A., Canadian Standards for Nursery Stock.

3.4.7 All plants specified may be moved with a mechanical tree spade providing adequate roots are kept as specified and provided that no excavation shall occur within 1m of utility trench alignments.

3.4.8 Minimum utility clearances must be maintained from the edge of the excavation by the tree spade of the involved utility must be contacted for approval and/or safety procedures required, i.e. hand digging.

3.4.9 Before removing plants from containers for planting, the plants shall be well watered to reduce injury.

3.4.10 In many plants, roots have a tendency to circle the container/pot. When this is apparent, outside roots should be gently loosened and the container cut vertically with a sharp knife in one or two places and the container/pot carefully removed. When the circling roots cannot be straightened or cut without affecting the structural root system the plant will be rejected. The tree must be securely rooted at FAC.

3.5 PLANTING BED PREPARATION

3.5.1 Beds that contain shrubs and trees shall be prepared to a depth of 450 mm. Reference detail LA108A, unless otherwise stated within specifications scope of work.

3.5.2 Beds that contain only trees shall be prepared to a depth of 450 mm. Reference details LA108, unless otherwise stated within specifications scope of work.

3.5.3 Bed edge must be cut to a vertical depth of 100mm and filled with mulch.

3.5.4 Landscape edgers and weed liners are not permitted.

3.5.5 Construct watering swales using topsoil from around the base of the plant. The use of watering swales is not identified on the standard details but may be required by the City and shall be at the Contractor's expense.

3.5.6 Install mulch as per applicable details.

3.6 TREE AND SHRUB PLANTING OUTSIDE PREPARED PLANTING BEDS

- 3.6.1 Staked locations of all trees and shrubs to be provided by the City prior to installation.
- 3.6.2 All trees and shrubs shall meet the requirements of Section 02910 - Topsoil.
- 3.6.3 If soil conditions warrant and as directed by the City, root holes dug by mechanical equipment shall be scarified to ensure that no glazed walls remain in root holes.
- 3.6.4 For tree root holes dug by a tree spade, provide root ball support of compacted native materials in the base of the root hole. Reference applicable details. Soil glazing from the tree spade shovels must be scarified.
- 3.6.5 The depth of the planting hole should be 40mm less than the height of the root ball. Adjust hole depth (as needed) to correct the depth of the tree, the top of the root ball should be 40mm above grade.
- 3.6.6 Trees and shrubs shall be faced to give the best appearance or relationship to adjacent structures, walkways or park features.
- 3.6.7 Planting topsoil shall be firmly tamped in place in such a manner that the plant retains its vertical position. Particular care shall be taken to ensure that no air pockets remain under or around the roots. The planting topsoil shall be thoroughly watered immediately after tamping. All non-porous or non-biodegradable containers shall be completely removed. Any settling of planting topsoil shall be brought up to the intended grade after settlement and prior to issuance of the Final Acceptance Certificate.
- 3.6.8 When planting, topsoil is installed up to about one half of the root ball height, ties shall be cut and the top portion of the burlap on balled and burlapped plants shall be cut back carefully, not disturbing the root ball, remove excessive topsoil to expose the original root flare and remove all girdling roots.
- 3.6.9 Top 1/3 of wire baskets to be folded back or removed and the top 1/3 of the burlap to be cut back and removed from root ball hole. If circling roots are found in the rootball, cut the root at the beginning of the circling.
- 3.6.10 Damaged or broken roots of bare root stock should be cut back with a sharp knife to living parts remaining. Spread roots out gently and evenly in the root hole and complete installation of topsoil.
- 3.6.11 For mulch application, reference applicable details.

3.7 CONSTRUCTION COMPLETION INSPECTION

- 3.7.1 Plant pits and tree and shrub beds shall be free of weeds, leaves, broken branches, and rubbish, and left in a neat and tidy condition. Soil within the drip line of the tree or soil ring (whichever is greater) shall not be cultivated.
- 3.7.2 All plants shall be alive and in a healthy, satisfactory growing condition.

3.8 WARRANTY

- 3.8.1 The Contractor is fully responsible for the general health and quality of all plant material delivered and installed.

3.8.2 All plant material shall be guaranteed for a period of one year, unless otherwise stated within the project scope of work/specifications, from the date of issuance of the Construction Completion Certificate. There is no warranty requirement on annuals, unless further noted.

3.8.3 All plant materials found dead or not in a healthy, satisfactory growing condition or which, in any other way, does not meet the requirements of the specifications, shall be replaced immediately by the Contractor at the Contractor's own expense.

3.9 MAINTENANCE

3.9.1 Maintenance shall include all measures necessary to establish and maintain all plants in an acceptable, vigorous and healthy growing condition for a period of one year from the issuance of a Construction Completion Certificate and until the issuance of the Final Acceptance Certificate.

3.9.2 Cultivated and weeding of planting beds and tree pits is the responsibility of the Contractor. The City may direct the use of herbicides for weed control; they shall be applied in accordance with manufacturer's recommendations by a licensed applicator. Damage resulting from the Contractor's use of herbicides shall be remedied at the Contractor's own expense.

3.9.3 Pruning, including the removal of dead, broken and diseased branches, immediately upon installation and in accordance with approved pruning methods.

3.9.4 The City may direct the use of chemicals and pesticides as control measures. If used they shall be applied in accordance with the manufacturer's recommendations by a licensed applicator. Damage resulting from the Contractor's use of chemicals and pesticides shall be remedied at the Contractor's own expense.

3.9.5 Maintain all accessories in good condition such as tree guy wires, rodent guards, and tree stakes. The City will direct the repair or replacement of all such accessories when required. If the trees are in the third growing season the tree stakes and wires shall be removed.

3.9.6 Watering trees and shrubs in sufficiently to meet plant requirements.

3.9.7 Water in tree and shrub root holes: All planting beds shall be filled to grade with planting topsoil and watered in. The use of a water probe to ensure the removal of all air spaces in the topsoil surrounding the plant's root ball is an acceptable method of watering in. The use of a water probe will be used to water in all tree spade transplanted trees.

3.9.8 The Contractor is responsible for supplying, loading, hauling and distributing water and fertilizer for maintenance purposes.

3.9.9 For capital projects, newly planted trees may require the application of a completely water-soluble high phosphorous fertilizer e.g. 10-52-10.

3.9.10 No fertilizer should be applied after July and August. The Landscape Architect may recommend other fertilizers for trees, shrubs and ground covers as required. The Landscape Architect will provide written confirmation of the dates for water and fertilizer applications prior to the issuance of the F.A.C. by the City.

3.9.11 Straighten all plants, which lean or sag during the warranty period. Straightening of trees is to be done in a timely manner to assist in establishment.

3.9.12 At the time of inspection for F.A.C. and at the conclusion of the warranty period, all non-mulched planting beds and tree pits shall be freshly cultivated. All planting beds shall be free of weeds, leaves and debris and shall be in a tidy condition. Mulch shall be raked.

3.10 PRUNING

3.10.1 All deciduous plants shall be pruned by or directly supervised by a certified professional (ISA Certified Arborist, Landscape Industry Certified Technician, Landscape Horticulturist (Red Seal or LGAP) or equivalent designation immediately after planting and as required during the warranty period according to the best management practices as defined by the International Society of Arboriculture in accordance with ANSI A300 Pruning Standards. The amount of pruning shall be limited to the minimum necessary to remove dead or injured branches. Pruning shall be done in such a manner as to preserve the natural character and shape of the plants. Only clean, sharp tools shall be used. All cuts shall be clean and cut to the branch collar, leaving no stubs. Cuts, bruises, scars or tears on the bark shall be traced back to living tissue and removed. The affected areas shall be shaped so as not to retain water.

Pruning outlined for these species as follows:

Birch	May 15 to June 15
Maple	June to July
Elm	October 1 to March 31

Or as approved by the Project Manager.

3.10.2 Do not cut a leader unless a lateral can be trained to take its place. Leader must be established prior to FAC.

3.11 STAKING AND GUIDING

Support plants with stakes and guy wires immediately after installation.

3.12 TREE SUPPORT:

3.12.1 Trees shall be braced upright in position by guy wire and stakes in accordance with the following table:

Coniferous: <u>Tree Height</u>	<u>Tree Support Method</u>
Up to 1.5 m	1 stake with 1 tie (optional)
1.5 m - 3.0 m	2 stakes with 2 ties (optional)
3.0 m - 3.5 m	3 guy wires with 3 anchors

Deciduous: <u>Tree Caliper</u>	<u>Tree Support Method</u>
Up to 30 mm	1 stake with 1 tie

30 mm - 100 mm	2 stakes with 2 ties
100 mm - 150 mm	3 guy wires with 3 anchors
150 mm and over	4 guy wires with 4 anchors

- 3.12.2** Wire for trees requiring guy wiring shall be looped around the tree and anchored in such a manner that looped wire will not interfere with normal growth. Guy wires shall be placed around the trunk at a point to ensure adequate support of the tree and in such a manner that the tree trunk or branches will not be subjected to undue strain or injury. Anchors shall be equally spaced around the tree pit. Reference applicable details.
- 3.12.3** Anchors required for the support of staked trees shall be painted metal “T” bars 40 mm x 40 mm x 5 mm thick and 700 mm to 750 mm long. Wires for fastening to anchors shall be pliable #12 galvanized wire. If used these shall be factory galvanized and of sufficient strength to withstand any wind pressure.
- 3.12.4** Anchors shall be left 150 mm above grade unless otherwise directed by the City and colour coded to City specifications.
- 3.12.5 Stakes:** “T” bar steel stakes 40 mm x 40 mm x 5 mm thick x 2.1 m length, U-bar stakes will be approved as a substitute, primed with one coat of zinc-rich paint to CGSB 1-GP-1816. Colour to be approved by the City. Top 300 mm tree stake colour coded to City specifications. See Section 02918 – Colour Coding of T-bar Tree Stakes. Ties shall be placed around the trunk to provide adequate support and to prevent damage.
- 3.12.6** The Contractor shall be responsible for keeping guy wires taut at all times and replacing broken guy wires in accordance with the specified warranty period and to ensure that the guy wires do not damage the tree trunk during growth.
- 3.12.7** Guy wires shall be flagged with fluorescent orange coloured tape. All guy wires are to be folded or bent in such a fashion so as not to be exposed outwardly. New black rubber hose, two-ply, reinforced and 12 mm diameter, or approved equal, shall be used to encase wires where they circle the trunk or branches.

3.13 REPLACEMENTS

- 3.13.1** The cost of replacements resulting from rodent damage, theft, vandalism, carelessness, or neglect on the part of others, or any replacements caused due to circumstances beyond the control of the City shall be borne by the Contractor or Developer, as applicable, before the issuance of a Final Acceptance Certificate.
- 3.13.2** All required replacements shall be by plants of the same size and species as specified on the Plant List and shall be supplied and planted in accordance with the landscape drawings and specifications.

3.14 TRANSPLANTING EXISTING TREES

- 3.14.1** The City of Edmonton Tree Policy should be referenced when transplanting trees in accordance with the following specification.

- 3.14.2** Size of root ball: 12 times the tree caliper measured at 300 mm above grade and deep enough to enclose 75% of the existing root depth. All stock greater than 100 mm will be measured 1500 mm above ground level.
- 3.14.3** Basket, double burlap and drum lace, or wire basket root ball before moving, or dig and transport by tree spade.
- 3.14.4** Place excavated tree spade root plugs in former tree locations where possible.
- 3.14.5** Size of new tree root hole is to be in accordance with standard details.
- 3.14.6** Plant, stake and guy wire, and maintain as outlined herein.
- 3.14.7** Warranty period for Nursery and “collected” as follows:
- All stock 0 - 80 mm* shall be 1 year.
 - All stock 90 - 150 mm shall be 3 years.
 - All stock 150 - 200 mm shall be 4 years.
 - No materials above 200 mm will be accepted.
- * Refer to clause 4.9.3 in the Landscape Design and Construction Standards.

3.15 PROTECTION OF EXISTING TREES

The protection of existing trees shall be as per City of Edmonton Corporate Tree Management Policy C456B. For more information see:

[Trees and Construction](#)

3.16 RESTORATION

Restore pavement, gravel stops, grassed area, planted area and structures damaged or disturbed during execution of work, in a manner satisfactory to City standards.

END OF SECTION

1. GENERAL

1.1 SCOPE

Supply of materials and construction of naturalized planting areas. Refer to Section 02920 - SEED AND SOD for the establishment of naturalized grass areas.

1.2 RELATED SECTIONS

Topsoil, Subgrade Preparation	Section 02910, Volume 5;
Mulches	Section 02914, Volume 5;
Seed and Sod	Section 02920, Volume 5;
Trees, Shrubs and Groundcovers	Section 02930, Volume 5;

1.3 PRODUCT DELIVERY, HANDLING and STORAGE

1.3.1 Refer to Section 02910 regarding supply and handling of topsoil.

1.3.2 Refer to Section 02914, Volume 5 regarding supply and handling of mulches.

1.3.3 Refer to Section 02920, Volume 5 regarding supply and handling of seed.

1.3.4 Refer to Section 02930, Volume 5 regarding supply and handling of plant material.

1.4 DEFINITIONS

Natural Appearing: appears non human made.

Native Material: plants and grasses native to the area. In certain cases, plants of the same genus may be accepted.

Naturalization: a type of habitat restoration; the deliberate reintroduction of species that are native to a given area or are well adapted to the climate circumstance; activities that are intended to improve and enhance the natural environment and reduce the required operational maintenance. The biodiversity and ecosystem function of a naturalized ecosystem is lower compared to a reference habitat but higher compared to a reclaimed ecosystem.

Plant Mats: excavated mats of native material containing plants, roots and related soil.

Live Soil: soils containing native plant material roots.

1.5 INSPECTION AND SUBSTITUTIONS

1.5.1 The City of Edmonton reserves the right to inspect all materials prior to installation. The Contractor must provide a sample of all materials to the City of Edmonton for approval prior to site installations, if requested.

1.5.2 Product may not be substituted nor installation methods changed from approved drawings unless approved by Parks.

1.5.3 At CCC inspection plant material approved on the drawings must be present and alive and meeting specifications.

1.5.4 At FAC inspection any dead, diseased or damaged plant material must be removed or replaced. This is to be determined based on design intention or as noted on the drawing.

1.5.5 All plant material must be visible for inspections.

2. PRODUCTS

2.1 PLANT MATERIAL

Native material as detailed on the approved drawings and meeting the requirements of Section 02930 - TREES, SHRUBS AND GROUNDCOVERS.

2.2 TOPSOIL

See Section 02910 – TOPSOIL for details.

2.3 MULCH

2.3.1 Coniferous shredded bark mulch as per Section 02914 - MULCHES is the preferred mulch.

2.3.2 Mulching of naturalization areas should only be used for initial planting and not permitted after establishment.

3. EXECUTION

2.1 TREE AND SHRUB BED NATURALIZATION

2.1.1 Reference detail LA111 for trees.

2.1.2 Reference detail LA110B for shrub beds.

2.1.3 Space all material to ensure full coverage.

2.2 INDIVIDUAL PLANT NATURALIZATION

2.2.1 Reference detail LA110-LA111.

2.2.2 Remove surface debris that might inhibit planting.

2.2.3 Construct individual pits for each plant as detailed.

2.2.4 For larger material install in individual pits reference details LA102 – LA113.

2.2.5 Space all material to ensure full coverage.

2.3 LIVE SOIL

When using live soil that is offsite, gather live soil and transport to site ensuring material is kept moist. Spread live soil to a minimum 300mm depth over the existing ground. Water thoroughly.

2.4 PLANT MATS

2.4.1 See section 02910 - TOPSOIL for depths and requirements.

2.4.2 Excavate a plant mat from the source site and transport to the site minimizing breakup of the mat and ensuring material remains moist.

2.4.3 Install the mat on the topsoil and cover all exposed edges with moderately compacted topsoil, ensuring stability of mats. Water thoroughly.

2.5 MULCHES

2.5.1 Mulch must be 25mm-50mm wood mulch applied loosely and incorporated with native seed mix. Apply one application of mulch at plant installation and allow to decompose during the establishment period.

2.5.2 Neither a weed barrier blanket nor an edger are permitted.

2.6 CLEAN-UP

Clean roadway, walkway and surrounding turf of mulches and other debris caused by work under this Section at the end of each working day or as directed by the City of Edmonton.

2.7 MAINTENANCE

2.7.1 Refer to Specification 02930 TREES, SHRUBS AND GROUNDCOVERS for weed free requirements at inspection points, throughout the warranty period and thereafter.

2.7.2 Spot control of weeds and seedling growth twice per year or as may be necessary. All mulched areas to be weed free at Construction Completion Certificate and Final Acceptance Certificate inspections.

END OF SECTION

1. GENERAL**1.1. SCOPE**

Supply and installation of collected stone and feature boulders.

1.2. RELATED SECTIONS

Grading	Section 2.3	Volume 2 Complete Streets
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Clearing and Grubbing	Section 2.2	Volume 2 Complete Streets
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1.3. QUALITY ASSURANCE

Make feature boulders and collected stone available at source for inspection and approval by the City. Approval at source will not impair the right of the City to inspect collected stone and boulders upon arrival on the site or during the course of construction and to reject them for non-conformance.

2. PRODUCTS**2.1. FEATURE BOULDERS**

2.1.1. All feature boulders are to be of a granite composition, relatively smooth surface and outline as found in locally occurring glacial deposition material unless approved by the City. Cracked boulders are not acceptable.

2.1.2. The seating feature boulders are to be used for seating and are to be a minimum of 900 mm x 1500 mm x 1500 mm with a smooth, reasonably level top and no sharp edges on sides or top.

2.1.3. Feature boulders placed in concrete at culvert ends, within park sites, shall be of relative smooth surface and outline, with a minimum diameter of 600 mm.

2.1.4. All other feature boulders shall have a minimum 1200 mm diameter and relatively smooth surface and outline.

3. EXECUTION**3.1. PREPARATION**

3.1.1. Prepare the slope to be protected by grading smooth to a maximum slope of 2:1 unless shown otherwise on the drawings.

3.1.2. Prepare a trench at the toe of slope if shown on the drawings or ordered by the City.

3.2. FEATURE BOULDERS

3.2.1. Supply and place all boulders in the locations designated by the City in accordance with the drawings.

3.2.2. Feature boulders are to be buried to 1/3 of their height, reference applicable detail.

3.2.3. Following the completion of the work specified in this section, the Contractor shall remove all surplus material and equipment from the site and leave it in a tidy condition to the satisfaction of the City.

END OF SECTION