



Design and Construction Standards

VOLUME 5 LANDSCAPING

Edmonton

June 2016 Edition

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1. Design Standards 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.

2. Roll Out Procedure

2.1 Developer and Other Projects

2.1.1 Design, drafting and construction requirements from the Design and Construction Standards, Volume 5: Landscaping (June 2016 edition) are applicable to all projects that are initiated into circulation as of July 1, 2016.

2.1.2 Projects initiated into circulation prior to July 1, 2016 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 Anything constructed prior to July 1, 2016 shall adhere to the applicable Standard when the construction occurred.

2.1.4.1 Trees initially planted prior to July 1, 2016 that require amendment as a result of inspection by disturbing the rootball (replacement, lift, lower or straighten) must be replanted to the current depth requirements (specifically root flare 40mm above grade).

2.1.5 Clause 4.8.2 is applicable as of July 1, 2016 for Developer and Other Projects.

2.1.6 The requirement for notification of the City for Pesticide use will come into effect January 1, 2017.

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:

- Trees and Shrubs for the Prairies (by Landscape Alberta, 780-489-1991, admin@landscape-alberta.com): latest edition, takes precedence if sizes/spreads are in conflict with other documents;
- Canadian Standards for Nursery Stock, Canadian Nursery Landscape Association (C.N.L.A);

- 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 C456A (Reference Appendix C). (Conflicts between this document and the Construction Design Standards will be resolved at the discretion of Parks/ Forestry);
- 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;
- 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;
- Environmental Impact Assessments (contact City of Edmonton, Sustainable Development);
- CSA Z614 - Children's Playspaces and Equipment;
- The City of Edmonton Playground Equipment Standard;
- Urban Parks Management Plan (UPMP);
- Utility Authority (contact respective utility company for R.O.W. landscape restrictions);
- 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 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.
- 3.3.2 City:** the City of Edmonton.
- 3.3.3 Parks:** Parks includes the a) Parks and Biodiversity section, within City Planning and the Sustainable Development Department, b) Landscape Design and Construction section, within the Facility and Landscape Infrastructure Branch and Integrated Infrastructure Services Department, c) Parks Operations sections, within Building and Parks Operations Branch and City Operations Department.
- 3.3.4 Director/Parks:** the Directors within a) Parks and Biodiversity section, within City Planning and the Sustainable Development Department, b) Landscape Design and Construction section, within the facility and Landscape Infrastructure Branch and Integrated Infrastructure Services Department, and c) Parks operations sections, within Building and Parks Operations Branch and City Operations Department, who are designated by the City of Edmonton to review all activities on parkland and represent the City of Edmonton as the authority to approve all landscape plans.
- 3.3.5 Landscape Architectural Technologist/Parks:** the person within Parks and Biodiversity, City Planning, Sustainable Development Department and Landscape Design and Construction, Facility and Landscape Infrastructure, Integrated Infrastructure Services who are responsible for coordinating the inspections and issuance of Landscape Construction Completion Certificates and Final Acceptance Certificates.
- 3.3.6 Consultant:** the professional hired by a Developer to represent the Developer's interests on a land development project. Note that the Landscape Architect may or may not be the prime consultant. Refer to the City of Edmonton Design and Construction Standards, Volume 1: General, Chapter 1 – Intent and Use of The Design Standards, Section 2.2.
- 3.3.7 Landscape Architect:** the Landscape Architect stamping and signing the submitted drawings. Must be a full member in good standing with the Alberta Association of Landscape Architects. Upon mutual agreement with Parks, the Landscape Architect may designate an appropriate representative for field work. Refer to the City of Edmonton Design and Construction Standards, Volume 1: General, Chapter 1 – Intent and Use of The Design Standards, Section 2.5.
- 3.3.8 Landscape Architect/Parks:** a Landscape Architect representing Parks and Biodiversity, City Planning, Sustainable Development Department and Landscape Design and Construction, Facility and Landscape Infrastructure, Integrated Infrastructure Services.
- 3.3.9 Planner/Parks:** a City Parks Planner representing Parks and Biodiversity, City Planning, Sustainable Development Department and Landscape Design and Construction, Facility and Landscape Infrastructure, Integrated Infrastructure Services.

- 3.3.10 Development Officer:** a person specifically delegated by the General Manager of Sustainable Development as having the authority to approve Development Permit applications, representing Development Services, Sustainable Development Department.
- 3.3.11 Forestry:** Building and Parks Operations, City Operations Department.
- 3.3.12 Project Manager/Parks:** a City project manager representing Landscape Design and Construction, Facility and Landscape Infrastructure, Integrated Infrastructure Services
- 3.3.13 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.
- 3.3.14 Site Development Drawings:** a scaled drawing outlining configuration, materials and grading intent, but lacking detailed construction information such as coordinates, dimensions and spot elevations.
- 3.3.15 Construction Drawing:** a scaled drawing with sufficient information such as coordinates, construction details, and grading, and planting information to facilitate construction.
- 3.3.16 As-Built Drawing:** a scaled drawing accurately surveyed and intended to record the post- construction conditions.
- 3.3.17 Red Line Drawings:** drawings submitted to Parks for review and approval indicating minor revisions to the previously approved landscape plan.
- 3.3.18 Developer:** the proponent initiating and funding a land development project. The Developer may be a private, public or not-for-profit entity.
- 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 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.
- 3.3.22 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. The biodiversity and ecosystem function of a naturalized ecosystem is lower compared to a reference habitat but higher compared to a reclaimed ecosystem.
- 3.3.23 Reclamation:** 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.

- 3.3.24 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.
- 3.3.25 Base Level Development:** as defined in the UPMP by the Parkland Classification System. See UPMP in the references section for more details.
- 3.3.26 R.O.W:** Right-of-way.
- 3.3.27 Low Impact Development (LID):** is a land development and storm water management approach that works with nature to manage storm water as close to the source as possible. LID focuses on maintaining and restoring the natural hydrological processes of a site.
- 3.3.28 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.

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 the Director/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 the Director/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.
- 4.1.8** After plans have been submitted and signed as Approved by City Departments and EPCOR Water Services, the Landscape Architect shall submit two complete sets of all plans to the Director/Parks a minimum of 48 hours prior to the commencement of any construction.

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, the Director/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 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 and hazard tree assessments with Forestry prior to commencement of any proposed work or acceptance for Parks inventory, as required.
 - 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. Note the As-Built should include:
 - Tree replacements that took place during the warranty period prior to FAC. Provide three sets of FAC application forms complete with reduced, legible drawings to Development Coordination for distribution to Parks.

- Inspection of all work prior to the FAC inspection to ensure the deficiencies have been completed satisfactorily.

4.4 Development Permit Landscape Plan Approval Process

- 4.4.1** 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.
- 4.4.2** 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.
- 4.4.3** 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.
- 4.4.4** Notify Landscape Architectural Technologist/Landscape Architect/Parks in writing when work is completed and that inspections are required.
- 4.4.5** The Landscape Architect shall adhere to all City requirements for landscape plans, including the Design and Construction Standards.
- 4.4.6** 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 Director/Parks prior to drawing revision.
- 4.4.7** The Landscape Architect shall submit the revised landscape plans to the appropriate City departments for signed approval.
- 4.4.8** The Landscape Architect shall then submit the approved City signed landscape plans complete with an electronic copy to the City of Edmonton Development Officer.

4.5 Construction Completion Certificate (CCC) Process

- 4.5.1** Inspections for Landscape Construction Completion Certificates (CCC) will be undertaken by Parks from June 1st - October 15th, based on snow coverage and weather dependent.
- Projects out of Parkland Developer Services Unit's scope will include a Parks Operations inspector.
 - Parkland Developer Services Unit's inspections may include Parks Operations, Forestry, Ecology, or other Edmonton representatives as required to complete the inspection.

- 4.5.2** 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.
- 4.5.3** The Landscape Architectural Technologist/Parks shall co-ordinate CCC inspection time and date with the Landscape Architect.
- 4.5.4** The Landscape Architect shall submit a standard form letter, three original copies of the standard Sustainable Development Department CCC form including all 11"x17" reductions of the latest City signed approved drawings and/or Red Lines, and forward them to Development Coordination, Sustainable Development.

 - City assets that only require a CCC will require the following documents to be submitted at the time of CCC application: latest approved landscape drawings (PDF and AutoCAD) and a Tangible Capital Asset form.
- 4.5.5** 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 identified in the re-inspection).
- 4.5.6** Development Coordination, Sustainable Development will distribute the three original CCCs to appropriate City Departments. On-site inspection shall be completed by Parks within thirty days of receipt of the above information by the Senior Development Engineer.
- 4.5.7** 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.
- 4.5.8** 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.
- 4.5.9** The Urban Forester will inspect all trees on site. All plant material must be visible.
- 4.5.10** 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.
- 4.5.11** 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.

4.6 Inspection of Environmental Reserves

4.6.1 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 Weed 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.

4.7 Inspection of Municipal Reserves

4.7.1 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 Weed 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.

4.7.2 Municipal Reserve that only requires a Construction Completion Certificate (CCC) shall require an AutoCAD version of the Approved Drawing.

4.8 Warranty Period

4.8.1 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.

4.8.2 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 25% or more of the turf has not established.

- At which time a new FAC application will be required.
- 4.8.3** If trees that are planted are selected from the trial list, reference Appendix H 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 are required to be replaced.
- 4.8.4** 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.
- 4.8.5** If at the time of inspection trees are determined to be 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 4.8.4.
- 4.8.6** All amenities shall be maintained for a minimum warranty period of twelve (12) months. (i.e. benches, garbage/recycling receptacles, etc.) The garbage receptacles must be emptied to the City of Edmonton standards until FAC.
- 4.8.7** All Parks fencing (i.e. metal, chain link, wood screen and rail fencing), shall be maintained as outlined in the Servicing Agreement.
- 4.8.8** The warranty period shall commence from the indicated inspection date, when the Construction Completion Certificate is approved by the Landscape Architectural Technologist/Landscape Architect/Parks.
- 4.8.9** All natural areas shall be maintained as per the Servicing Agreement.

4.9 Maintenance Agreement

- 4.9.1** 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 the Director/Parks.

4.10 Final Acceptance Certificate (FAC) Process

- 4.10.1** Inspections for Final Acceptance Certificates (FAC) will be undertaken by Parks from June 1st - September 30th based on snow coverage and weather dependent.
- 4.10.2** 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.
- 4.10.3** 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.
- 4.10.4** The Landscape Architect shall submit a standard letter, three original copies of the Sustainable Development Department FAC form including all 11"x17" reductions of the latest City signed approved landscape drawings, As-built AutoCAD drawing, As-built PDF drawing, Maintenance Log and Total Capital Assets Form, forwarding them to Development Coordination, Sustainable Development.
- 4.10.5** The contractor shall provide all maintenance records for the site between CCC and FAC. This shall include standard maintenance tasks including dates when that maintenance occurred. Records shall also include pesticide application logs. Replacement tree and shrub planting must be indicated on drawings. These logs must be uploaded to Eplan as part of the supporting documents required for inspection to occur. This record must be provided with the inspection request.
- 4.10.6** Development Coordination, Sustainable Development will distribute the three original FACs to appropriate City Departments. On-site inspection shall be completed within thirty days of receipt of the above information by the Senior Development Engineer.
- 4.10.7** The Landscape Architectural Technologist/Parks shall co-ordinate FAC inspection time and date with the Landscape Architect.
- 4.10.8** On the date of the site inspection, the Landscape Architectural Technologist/Parks or designate, will meet the Landscape Architect at the pre-arranged location.
- 4.10.9** 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.
- 4.10.10** 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.
- 4.10.11** 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).

- 4.10.12 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.
- 4.10.13 If the trees are in the third growing season, one tree stake and all guy wires shall be removed.
- 4.10.14 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.

4.11 Landscape Crossing Procedures for Pipeline Corridors

- 4.11.1 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.
- 4.11.2 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.
- 4.11.3 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.
- 4.11.4 The Landscape Architect shall ensure that three complete sets of the proposed landscape plans are circulated to the proper Utility and/or Pipeline Authority.
- 4.11.5 Upon receipt of the above outlined letter, reference Section 4.11.3. 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 Director/Parks.
- 4.11.6 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.
- 4.11.7 The Landscape Architect shall ensure coordination of the Crossing Agreement between the Developer and the Authority as required.
- 4.11.8 The Developer shall ensure a copy of the signed Crossing Agreement and signed landscape plans are available on-site at all times.
- 4.11.9 The Landscape Architect and Consultant are responsible for ensuring that all aspects of the Crossing Agreement are followed.
- 4.11.10 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.

- 4.11.11 The Developer shall not commence any ground disturbance until all the above conditions have been met.

4.12 Pesticide Notification Requirements

- 4.12.1 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](#).
- 4.12.2 Developers shall provide signs indicating that areas have received herbicide treatments wherever there is a potential for public exposure. Reference Appendix G Pesticide Notification Signage Template.
- 4.12.3 A 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.”

4.13 Environmental Considerations

- 4.13.1 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.
- 4.13.2 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, setback requirements, etc.
- 5.1.3 All plans shall contain notes detailing all relevant planting setback requirements.

5.1.4 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.

5.1.5 All plans shall contain notes outlining precautionary requirements such as the necessity for hand digging or notification of Utility Authorities before construction.

5.1.6 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;
- Azimuths, iron bars, corner stakes and datum points;
- 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; 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 walls, 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 all 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, C456A.
 - Detailed tree protection plan and/or drawing(s) for all remaining trees. Site lay down area(s) and construction access(es) must be identified on all of the plan(s).
 - For relatively small areas where trees are evaluated individually by Forestry, identify hazard trees for removal.
 - For relatively small areas, identification of tree species and appropriate size information including caliper, height/spread - for the above removals and relocations.
 - For larger areas where trees are evaluated by Forestry, delineating areas of trees to be removed.
 - For larger areas, 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, size (m²), and materials for all surface treatments including, but not limited to:
- Mulched planting beds;
 - Perennial areas;
 - Naturalized areas;
 - Seeded and sodded 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 Storm Water Management Facility Drawing Requirements

- 5.3.1** In addition to the requirements outlined in Section 13, all landscape drawings identifying a Storm Water 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; and,
 - SWMF planting list.
- 5.3.2** If possible storm water 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, 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** Pre-cast concrete boat ramps are required for all Storm Water Management Facilities; see the City of Edmonton Design and Construction Standards, Volume 3: Drainage, Section 16.11 Maintenance Access Requirements, for specifics.

5.4 Landscape Staking Plan

- 5.4.1** A Landscape Staking Plan shall be required only in those instances where critical dimensions must be provided to successfully implement the proposed design. The requirement for a comprehensive staking plan will remain at the discretion of Parks. All dimensions should be tied to legal boundaries. All on-site staking by the Landscape Architect shall be noted on the plan.

5.5 Landscape Planting Plan

- 5.5.1** The Landscape Planting Plan shall be drawn to a scale of 1:500 or larger (such as 1:250).
- 5.5.2** The Landscape Staking Plan may be combined with the Landscape Planting Plan if the scale and scope of planting design allows the information to be clear on one drawing.

- 5.5.3** 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 plant list and be subject to CCC and FAC inspection.
- 5.5.4** The Planting Plan shall note minimum planting quantity requirements in tabular form, based on area measurements (m^2) of individual areas, including, but not limited to, Utility R.O.W's, Walkway R.O.W's, Storm Water Management Facilities, Park Areas and Roadways.
- 5.5.5** The Planting Plan shall include proposed locations for trees, shrubs, perennials and ground covers, clearly labelled and cross-referenced to the plant list.
- 5.5.6** The Planting Plan shall include notes detailing all seed and sod mixes being specified. Seed mix notes shall include standard application rates.
- 5.5.7** Plant material graphic symbols shall represent mature spread of shrubs as per Trees and Shrubs for the Prairies (see Section 3.2.1 Reference Documents).
- 5.5.8** Tree symbols are to be drawn at mature spread, as per the recommended tree spacing, reference Appendix H Tree Diversity Guidelines and Approved Species Spread and Spacing
- 5.5.9** Shrub symbols should be shown at mature size with no overlap. Tree and ground covers symbols may be overlapped at the discretion of the City.
- 5.5.10** All shrub and coniferous tree material symbols shall be contained within a planting bed, with a minimum 500mm width mulched area between the edge of the mature shrub/coniferous tree and the edge of the shrub bed.
- 5.5.11** Where possible, shrub beds should be designed with tapered or flowing edges to allow for ease of mowing with machines, leaving no uncut grass.
- 5.5.12** 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.
- 5.5.13** 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.
- 5.5.14** The Planting Plan shall identify all proposed surface treatments and other applications.

5.6 Plant List Requirements

- 5.6.1** 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;
 - Maximum caliper/height; and,
 - Remarks including special comments or unique installation criteria.
- 5.6.2** A note indicating that metal bar tree stakes are not allowed within 1.0m of an underground electrical trench shall be included.
- 5.6.3** Prior to installation, Forestry may inspect local nursery stock for acceptability at the cost of the Developer. The Landscape Architect 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.

5.7 Projects of Limited Scope

- 5.7.1** 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.

5.8 Landscape Construction Details

- 5.8.1** Typical construction details such as furniture anchor pads, standard furniture, park lighting, screen, uniform and solid fences, sidewalks, curbs, gutters, etc. shall be shown at an appropriate scale and cross-referenced with the landscape plans and engineering drawings as required. 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.

5.9 Architectural, Structural, Mechanical and Electrical Plans

- 5.9.1** Detailed Architectural, Structural, Mechanical and Electrical plans are required by Parks where the proposed facilities will be maintained by Citizen Services. 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.

5.9.2 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 responsible for maintenance.

5.9.3 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 Citizen Services.

5.10 As-Built Drawings

5.10.1 The Landscape Architect shall submit one complete set of electronic As-Built drawings (AutoCAD or Microstation File, which are spatially correct), to the Director/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.

5.10.2 As-Built Drawings will identify the following items:

- Changes for planting, grading, staking or construction detailing;
- Important subgrade features not shown on approved drawings and identified through construction; and,
- Major site utility conflicts identified during plant installations.

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

5.11 Red Line Drawings

5.11.1 Refer to the City of Edmonton Design and Construction Standards, Volume 1: General, Section 7.8 Design Revisions after Approval.

6. Landscaping Standards Change Request Process

6.1 Formal Change Request Process

6.1.1 Parks and Biodiversity have committed to review, revise and release the Landscaping Design and Construction Standards on an annual basis.

6.1.2 All Change Requests must be submitted on the approved Change Request Form, to the City of Edmonton, Parks and Biodiversity. Reference Appendix E Change Request Form.

6.1.3 All Change Requests are subject to City of Edmonton, Parks and Biodiversity approval.

6.1.4 Approved Change Requests will be reflected in the yearly revision of the City of Edmonton Design and Construction Standards, Volume 5: Landscaping. All revisions will be identified in Appendix F Revision Log.

7. Plant Materials

7.1 General Recommendations for Trees

- 7.1.1** 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 pests 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 Section 7.4 Tree Setbacks from Utilities and Property Lines, 7.5 Tree Setbacks from Walkways and Roads, 7.6 Tree and Shrub Planting Setbacks and Spacing, 7.9 Approved Tree Species, Spread and Spacing Requirements and Appendix H Tree Diversity Guidelines and Approved Species Spread and Spacing.
- 7.1.4 Soil Volume**
- 7.1.4.1** 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 74m² or spread of over 5 meters and require a minimum soil volume of 17m³.
 - Small canopy trees are defined as trees that under normal conditions have a spread of 5 meters and require a minimum soil volume of 11m³ and under ideal conditions require 17m³ to reach its full potential.
 - Should the design of the area not allow for the minimum required soil volume, please contact Forestry for recommendations.

7.2 Naturalization

- 7.2.1** The City of Edmonton is moving towards a more naturalized landscape aesthetic in the following areas: major roadways, utility corridors, non-programmable or low use park spaces, shrub beds in appropriate areas (e.g. nature parks or parks near natural areas/river valley), low impact development (e.g. bioswales and rain gardens), and storm water management facilities. Naturalization is supported by the City of Edmonton as a means to provide more sustainable landscapes, to enhance biodiversity, and to provide educational opportunities.
- 7.2.2** 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.

- 7.2.3** Naturalization may be required where natural tree stands or natural open areas are removed or impacted during construction or other activities.
- 7.2.4** Naturalized areas must be set back 30m from playgrounds.
- 7.2.5** 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, major utility and road R.O.W's.
- 7.2.6** 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.
- 7.2.7** 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.
- 7.2.8** 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 materials, where possible and appropriate, be of larger sizes. Larger material (trees or larger shrubs) shall be at least 40mm caliper size (deciduous), 2.5m height (coniferous) and 5 gallon pot size (shrubs).
- 7.2.9** Forestry stock, seedlings, deciduous tree whips and propagated/rooted cuttings are acceptable for use from an approved source.
- 7.2.10** All plant materials are to be nursery grown stock, with the exception of native spaded plugs and plant material.
- 7.2.11** Collected plant materials may be used with prior approval. Landscape drawings shall identify areas to be planted with collected material and also indicate the site from where source material has originated.
- 7.2.12** 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.
- 7.2.13** All natural sites (Natural Areas and Naturalized areas) must be cleaned and checked for hazards such as old barbed wire fences, abandoned structures, basements and any other objects that may be hazardous to citizens.

7.3 Designated Roadway Tree Planting Corridors

- 7.3.1** Collector and arterial roadways must incorporate a utility-free planting corridor within boulevards and medians to accommodate planting requirements with appropriate setbacks. If trees are on the plan and cannot be planted due to utility or access conflicts, these trees should be planted where possible within the same stage of development.

7.4 Tree Setbacks from Utilities and Property Lines

- 7.4.1** Where possible, trees shall be setback a minimum distance, measured from the center of the tree trunk, from above and below grade utilities and property lines as follows:

| Tree Setbacks from Utilities and Property Lines | |
|--|-----------------|
| Distance from Light Standards/ Power Hardware | 3.5m |
| Distance from Fire Hydrants | 3.5m |
| Distance from Stop Signs | 3.5m |
| Distance from Yield Signs | 3.5m |
| Distance from Transit Zones | 3.5m* |
| Distance from Other Signs | 2.0m |
| Distance from Private Property on Walkway R.O.W. | 1.0m |
| Distance from Private Property on Open Parkland | 3.0m |
| Distance from Private Property on Boulevards | 1.0m |
| Distance from Shallow Underground Utilities | 1.0m |
| Distance from Gas or Oil R.O.W. | Contact Utility |
| Distance from Deep Underground Utilities | 1.5m |
| Distance from Sanitary and Storm Sewers | 1.8m |
| Distance to Sanitary and Storm Sewers and Manholes | 2.0m |
| Distance from Water Mains | 2.5m |
| *Ensure trees do not create sightline obstructions for vehicles approaching transit zones. | |
| Note: Distances from overhead power utilities shall be as per the requirements established by the Utility Authority. | |

7.5 Tree Setbacks from Walkways and Roads

- 7.5.1** Where possible, trees shall be setback a minimum distance, measured from center of the tree trunk, to walkway and roads as follows:

| Local Residential | |
|---|-------|
| Face of Curb | 1.25m |
| Face of Curb (Boulevard Without Sidewalk) | 2.0m |
| Collector Residential or Local Industrial (Roadway Width less than 14.5m) | |
| 20m R.O.W. | |
| Face of Curb | 1.25m |
| R.O.W. greater than 20m | |
| Face of Curb | 1.65m |
| 14.5m Industrial or Local Collector | |
| Face of Curb | 1.65m |
| Arterial Roadway | |
| Face of Curb | 2.0m* |
| Hardsurface | |
| Edge of Commercial or Industrial Accesses | 1.5m |
| Edge of Residential Driveways | 1.0m |
| Edge of Sidewalk | 1.0m |
| * Distances less than indicated above, are at the discretion of the Director/Parks in consultation with Transportation. | |
| Note: Setback distances apply to both Boulevards and Medians. | |

- 7.5.2** There shall be no mulched beds within 2.5m of curb on boulevards along arterial and collector roadways.

7.6 Tree and Shrub Planting Setbacks and Spacing

- 7.6.1** Where possible, it is suggested that landscape improvements and plant materials have increased setbacks from underground utilities.
- 7.6.2** There shall be no excavations undertaken within 1.0m 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.
- 7.6.3** In the event that the mechanical tree digging equipment cannot maintain a minimum clearance of 1.0m 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 Section 7.4 Tree Setbacks from Utilities and Property Lines.
- 7.6.4** Planting distances from low, intermediate and high-pressure pipelines are to be observed as dictated by the Pipeline Authority.

- 7.6.5** Setback distances apply to all tree and tree form shrub species. Species with suckering root systems or large hanging canopies may require increased setbacks (i.e. Poplars and Willows). Refer to Section 7.4 for appropriate setback distances.
- 7.6.6** Setbacks for coniferous trees are to be no less than the distances indicated above, but will be reviewed and approved on a case by case basis in regard to concerns over potential mature size. Coniferous trees must maintain clearance from fence lines at maturity.
- 7.6.7** Planting *Populus* spp. on parkland adjacent to private property is generally not recommended. However:
- Should Northwest Poplar, Balsam Poplar and Cottonwood be referenced, the minimum setback distances from private property lines shall be 15m due to root encroachment concerns.
 - Should Northwest Poplar, Balsam Poplar and Cottonwood be referenced, the minimum setback distances from hard surfaces shall be 10m, unless special construction details are used.
 - All other *Populus* spp., including columnar varieties, shall have a minimum setback of 10m from private property lines and 5.0m from hard surface areas where sub surface compaction has occurred.
 - Some allowances may be made at the discretion of Forestry if there is special construction mitigation in place, such as a root barrier.
- 7.6.8** Shrub setbacks from shrub bed edges shall reflect mature diameter with the entire shrub contained in the bed. Mature spread cannot encroach on the sidewalk or onto fences. There must be 500mm from the edge of the bed or fence or sidewalk from the mature spread of the shrub.
- 7.6.9** Planting bed locations should accommodate the use of large turf maintenance equipment. Provide a minimum 2.5m clearance between the edge of a bed and obstructions such as fencing, furniture, buildings, individual trees etc. 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.
- 7.6.10** Where there is turf between planting beds and adjacent fences the minimum distance shall be 2.5m.
- 7.6.11** 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.
- 7.6.12** There shall be a minimum 3.0m planting setback of shrub beds from play space envelopes (playground equipment and splash parks). The design preference is naturalized planting.
- 7.6.13** On School playground sites, there shall be no shrub beds within 30m of the playground envelope. The design preference is naturalized planting.

7.7 Tree and Shrub Minimum Sizes

- 7.7.1** Unless noted otherwise or approved by the Director/ Parks, all planting shall be a minimum of 50mm caliper for deciduous trees and 2.0m height for Coniferous trees. A tree mix of deciduous and coniferous is generally encouraged where practical.
- 7.7.2** If proposed trees are less than the minimum caliper, additional plant material may be required, at the discretion of the City.
- 7.7.3** 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 Forestry five business days prior to tree root trenching. If tree root trenching in boulevards is not proposed for trees 80mm caliper and larger, then a 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.
- 7.7.4** Coniferous trees up to the height of 3.6m 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.
- 7.7.5** Minimum shrub spacing shall be based on spread at maturity. 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.

7.8 Required Planting Quantities for Open Spaces

- 7.8.1** The following tree quantities are outlined in the Urban Parks Management Plan (UPMP) as 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 the Director/Parks.
- River Valley 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; (UPMP specifies 8-10m spacing).
 - 70 trees/ha is required for other parkland not identified above.

- 7.8.2** Seven 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.
- 7.8.3** The Director/Parks retains the right to request variances from the required quantities as listed above.
- 7.8.4** 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) 60mm Cal. | (2) 40mm Cal. | (5) 20mm Cal. | (7) 5 Gallon Pot | (25) minimum 100mm Pot |

- A maximum of 10% of the required 60mm caliper trees on a site may be substituted for smaller material.
- Emergent material does not qualify into the shrub or tree equivalency.
- Shrub size requirement can be substituted at a rate of 5 shrub plugs for 1 full size shrub.
- Example: One 60mm caliper full size tree can be substituted with either two, 40mm caliper potted trees, or five 20mm caliper potted trees or twenty five 100mm pot (tree or shrubs, whips and plugs).

7.9 Approved Tree Species, Spread and Spacing Requirements

- 7.9.1** Forestry and Parks have developed a list of acceptable tree species with recommended spacing and spread, Appendix H 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.
- 7.9.2** Trees identified in Appendix H 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.
- 7.9.3** When grouping Coniferous trees, place trees in mulched beds with appropriate spacing as per the above recommended tree spacing.
- 7.9.4** Tree spacing and species selections should consider site specific CPTED principles and sightline concerns.

7.10 Planting Annuals

- 7.10.1** Annual plantings shall not be approved in planting beds to be maintained by the City.

- 7.10.2** Annuals may be approved in planting beds by the Director/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.

7.11 Planting Perennials

- 7.11.1** Perennials in planting beds will be reviewed on an individual basis and accepted at the discretion of the Director/Parks.
- 7.11.2** Only low maintenance, non-invasive and hardy perennials will be accepted.

7.12 Tree Protection Zone

- 7.12.1** Where sod will not be placed until completion of all construction activities, protection of boulevard trees is required. Reference City of Edmonton details LA100 - Large Tree "Tree Protection Zone" and LA101 - Small Tree "Tree Protection Zone" (maximum 80mm caliper). The Landscape CCC may be granted without sod being installed, on local road boulevards.
- 7.12.2** All tree protection zones are to be removed by the Developer, after issuance of the FAC by Parks, unless otherwise directed.

7.13 Weed Control

- 7.13.1** Noxious weeds must be controlled in accordance with the Provincial Weed Control Act. Prohibited noxious weeds must be eradicated in accordance with the Provincial Weed Control Act (see Reference section).
- 7.13.2** Aquatic invasive species shall be controlled as per the Fisheries (Alberta) Act.
- 7.13.3** 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.
- 7.13.4** Natural areas and naturalized areas must be in compliance with the Weed Act and associated Natural Area Management Plan (NAMP), prior to issuance of FAC.

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** Boulders are to be immovable by hand and located in visible areas to minimize public safety hazards.
- 8.1.3** 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 waste receptacles may be provided on parkland if appropriately located and approved by the Director/Parks.

- 8.2.2** 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.
- 8.2.3** Minimum required setback distances for site furniture, measured from the outer face of the amenity, are as follows:
 - Benches - 1.0m minimum from back of walkway.
 - Waste Receptacles – 600mm minimum from walkway and minimum 3.0m from benches.
 - Picnic Tables - 1.0m minimum from back of walkway.
- 8.2.4** All amenities must be placed on a concrete pad or secured with a concrete footing.
 - The concrete pad should extend 150mm beyond the outside edges of the site furniture to accommodate mowing.

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 50mm 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: Roadways, Detail 5205.
- 8.3.6** All Chain Link Fencing shall conform to City of Edmonton Details LA407-LA409A.
- 8.3.7** Other styles of fencing may be proposed subject to approval by Parks.

8.4 Fencing Adjacent to Open Space

- 8.4.1** School, park sites and other park site 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 1.2m 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 1.8m 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 1.8m height fencing. Contact a Planner/Parks or Landscape Architect/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 the Director/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 a Planner/Parks or Landscape Architect/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.
 - Locate playgrounds centrally between Community League sites and schools are desirable. Where ever 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, 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.

9.2 Sports Fields

- 9.2.1** Sports fields require a minimum 6.0m 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/Parks for more information.
- 9.2.2** Contact a Landscape Architect/Parks 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.

9.3 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** 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 City of Edmonton Playground Equipment standard.

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.

10. Road Right-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 Section 7.5 Tree Setbacks from Walkways and Roads.
- 10.1.2** All trees shall be planted as per the City of Edmonton Design and Construction Standards, Volume 2: Roadways.
- 10.1.3** Alternative tree and shrub species for roadway planting will be considered and are subject to approval by the Director/Parks.

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 the Director/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 750mm height.
- 10.2.3** Shrubs and trees may be planted along the fence at neighbourhood entrances with approval by Transportation Services and the Director/Parks. The mature shrubs spread must be 500mm 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 of 100mm, and sodded between the back of curb and the walk by the Developer to the satisfaction of the Director/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** Tree planting is required on collector roads, and shall be the minimum requirement of one tree per 10 linear meters on both sides of the collector roadway. Trees shall be spaced as appropriate to the species and as recommended by Forestry. Reference Appendix H Tree Diversity Guidelines and Approved Species Spread and Spacing and must respect minimum offset distances to existing utilities within the R.O.W.

10.4 Arterial Roadways

- 10.4.1** 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 should be used in appropriate locations, using the appropriate grass, shrub and tree species. Reference Section 7.2 Naturalization.
- 10.4.2** Arterial R.O.W must be graded, topsoiled, seeded or sodded, and landscaped to the satisfaction of the Director/Parks.
- 10.4.3** There shall be a row of boulevard trees at a minimum requirement of one tree per 10 linear meters on both sides of the arterial roadway. Trees shall be spaced as appropriate to the species and as recommended by Forestry. Reference Appendix H Tree Diversity Guidelines and Approved Species Spread and Spacing.
- 10.4.4** There will be a row of shrubs at 1.2m spacing in a shrub bed behind the walkway on each side of the arterial. Perennials, ground covers, and tree plantings may be substituted at an equivalent rate, or plant quantities may be adjusted to meet the mature spread requirements of the proposed plant material as determined by the Director of Parks.
- 10.4.5** Where possible, new utility locations shall be adjusted accordingly to accommodate landscaping, as per Section 7.3 Designated Roadway Tree Planting Corridors, 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.
- 10.4.6** On 4.5m 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 shall be spaced as appropriate to the species as recommended by Forestry, reference Appendix H 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.
- 10.4.7** 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.
- 10.4.8** 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.
- 10.4.9** 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.

- 10.4.10** 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.
- 10.4.11** 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.
- 10.4.12** Naturalization designs for arterial R.O.W. should be used in appropriate locations. Reference Section 7.2 Naturalization.
- 10.4.13** When only one side of the arterial is being developed, future trees and shrub beds shall be shadowed in on the landscape drawings on the side of the arterial not being developed, to accommodate future budgeting.

10.5 Industrial Areas

- 10.5.1** Arterial roads in industrial areas require landscaping as per arterial requirements above. The shrub requirement will be evaluated on a case-by-case basis by the Director/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 7.2 Naturalization.
- 10.5.2** Arterial and collector roads in industrial areas require a row of trees on each side, spaced as per Forestry recommendations.
- 10.5.3** 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 Major Entrance Routes to the City and Downtown

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

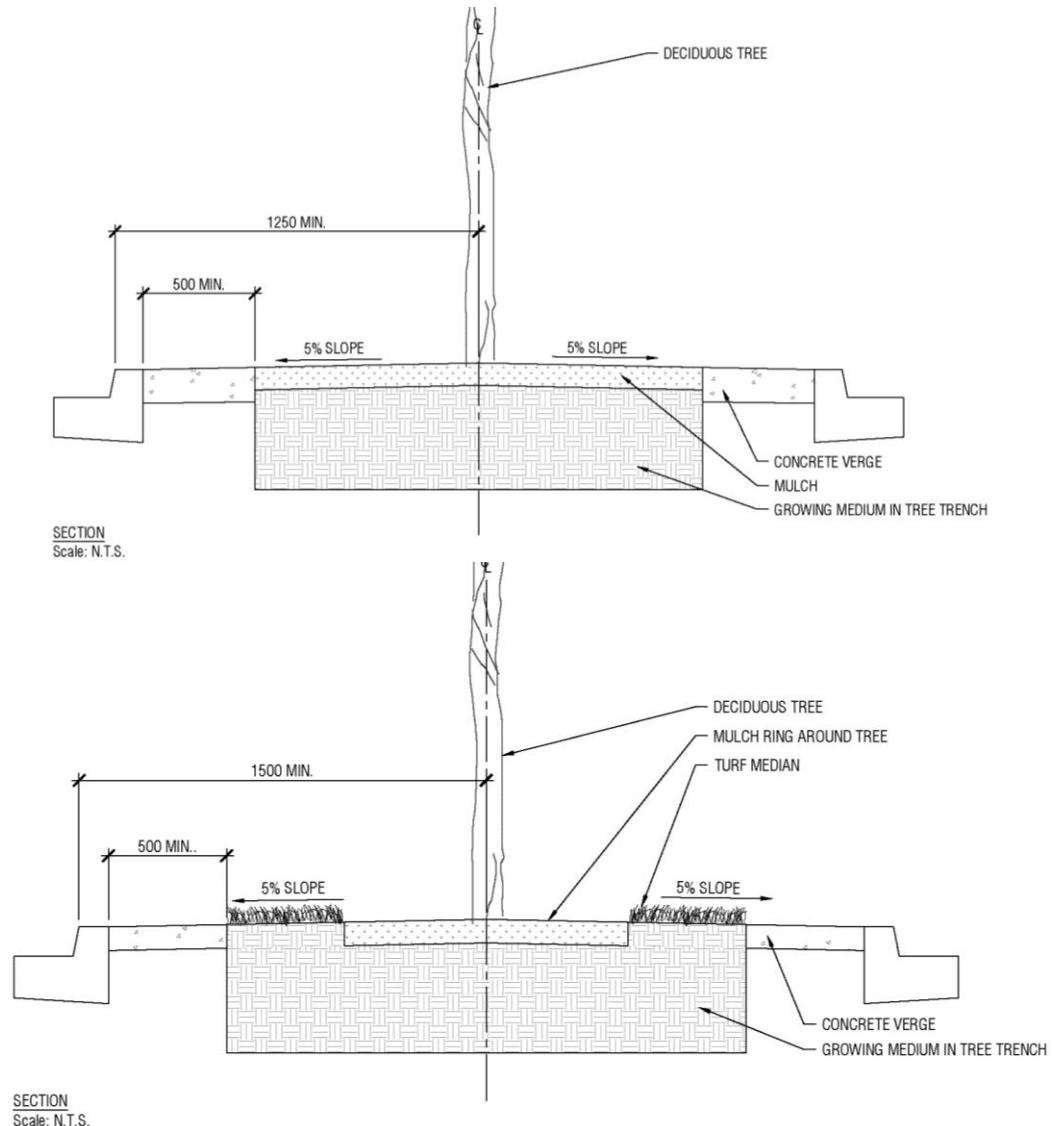
10.7 Major Commercial Corridors

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

10.8 Road Islands, Median, and Entry Features

- 10.8.1** All road islands, medians and entry feature designs are encouraged to be low maintenance. Where appropriate, designs shall include trees, shrubs, groundcovers, mulch, sod and boulders to the satisfaction of the Director/Parks. Shrubs must be low growing with a maximum mature height of 750mm. A 500mm concrete verge is required on either side of the bed.
- 10.8.2** Trees planted in center medians are to be in continuous mulched beds.

- 10.8.3** A minimum 1.25m buffer strip is required on either side of the median and mature plant material shall not extend into the buffer strip (to accommodate snow storage and spring sediment removal). If turf is specified, a minimum 1.5m buffer strip is required, the concrete verge may be included in this measurement.



- 10.8.4** The required cross slope shall not be less than 5% from center of island to curb.
- 10.8.5** Turf installed in center medians is to be laid out in such a manner that a driven mower can access the median 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. The minimum width of sod strip from back of curb is 1.5m. Sod is not to be installed in a median in a manner that will not accommodate a driven mower.
- 10.8.6** Shrubs symbols shall be shown at mature size with no overlap on the landscape drawing. Shrubs shall be setback 1.0m from the face of the curb to the edge of the mature shrub.

- 10.8.7** 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.
- 10.8.8** 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.
- 10.8.9** All paving stone and paving stone headers, concrete or other special hard surfaced verges or walks shall be to the satisfaction of Transportation Services.
- 10.8.10** 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.
- 10.8.11** Cross sections of road islands and medians shall be drawn to an appropriate scale showing:
 - Above and below ground utility alignments within 3.0m of road island;
 - Curb face;
 - Back of curb, verge or walk;
 - Tree and shrub setbacks;
 - Proposed planting and spacing;
 - Landscape mulches and free-standing features, (i.e. signs, gates, pedestals, sculptures and light poles); and,
 - Private property lines.
- 10.8.12** Planting cross sections and planting installation details shall be cross-referenced with engineering and landscape plans which support the proposed design solution.
- 10.8.13** 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- Way and Top of Bank Landscape Requirements

11.1 Walkway and Emergency Right-of-Ways

- 11.1.1** R.O.W. areas must be graded, topsoiled, and seeded or sodded, including planting with trees shrubs and groundcovers to the satisfaction of the Director/Parks.
- 11.1.2** Groundcovers such as herbaceous perennials are not desired, although exceptions for very hardy species may be made by the Director/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 with a 1.5m walkways shall be set back a minimum distance of 1.0m from center of tree trunk to the adjacent private property lines, in order to allow for root trimming at the discretion of the Director/Parks. Trees must be contained within mulched beds. All minimum utility setbacks are to be maintained. Reference Section 7.4 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 0.5m setback from the edge of the mature shrub to the edge of the walkway. Plant material locations must maintain an unobstructed clearance of 4.0m to provide emergency vehicular access.
- 11.1.9** For walkway R.O.W's, there shall be no shrubs exceeding a mature spread of 2.0m.
- 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 2.5m 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.
 - Shrubs with horizontal root habits (e.g. Prickly Rose – *Rosa Acicularis*) shall not be allowed along private property lines.
 - 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 D Top of Bank Policy C542.
- 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 Weed Act;

- The trail should be offset a minimum of 1.5m from private property, unless the geotechnical report would necessitate encroachment of the minimum offset, and provide a mow strip of 1.0m 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** Utility corridors may be landscaped, and are to be planted with a minimum of 75 trees per hectare. Tree plantings should be designed and massed into major groupings in mulched tree beds. Minimum deciduous tree caliper shall be 50mm. Minimum coniferous tree height shall be 2.0m. 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** 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.
- 12.1.3** 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. The Crossing Agreement is to be included with any Landscape Plans to the City for review.
- 12.1.4** The Landscape Architect shall provide to the Director/Parks written confirmation from the Utility Authority when landscaping in utility corridors is not permitted.
- 12.1.5** Shrubs shall be massed within planting beds.
- 12.1.6** At the discretion of the Director/Parks, the above landscape requirements may be substituted in whole or in part with a naturalization landscape design of equal value and quality.
- 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 C456A, 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 the Director/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 The Director/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 High Pressure Gas Right-of-Ways

- 12.3.1 These requirements provide for some limited development without compromising the safety and/or integrity of high-pressure natural gas facilities.
- 12.3.2 These requirements apply to odorized natural gas high pressure pipeline R.O.W. above 100 psi or 740 kPa.
- 12.3.3 Authorization must be requested and approved by all Utilities for all development on pipeline R.O.W.
- 12.3.4 Development is not permitted on a R.O.W. that contains an unodorized pipeline.
- 12.3.5 Contouring is acceptable within the R.O.W. Subgrade fill cannot be reduced over the pipeline but it may be increased. The total subgrade fill cannot exceed 2.0m over the pipeline. This will allow access to the pipeline for repairs without having to shore or excessively back slope the excavation. Contouring must not restrict access to the R.O.W.
- 12.3.6 Parallel walkways must be located between the pipeline and the nearest boundary of the R.O.W. and must not encroach onto the R.O.W. by more than 3.0m, nor be constructed over the pipeline.
- 12.3.7 Trees shall be planted with a minimum setback of 5.0m from the pipeline and have a mature height to a maximum of 10m. The mature canopy cannot extend over the pipeline.
- 12.3.8 Shrubs shall be hand planted with a minimum setback of 2.0m from the pipeline, and have a maximum mature height of 2.0m.
- 12.3.9 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.
- 12.3.10 Appropriate signage of these developed R.O.W. may be provided and maintained by the Developer and The City.
- 12.3.11 Any other proposed developments and/or use for the R.O.W. are not permitted.
- 12.3.12 Pre-existing deviations from the standards which are otherwise non-compliant shall be allowed to continue until redevelopment occurs.

13. Constructed Wetlands, Storm Water Management Facilities

13.1 General Landscape Requirements

- 13.1.1** The City of Edmonton is moving towards a more naturalized landscape aesthetic in certain areas. Constructed storm water wetlands are human-made systems, designed, constructed and operated to emulate natural wetlands or many of their biological processes. Constructed wetlands should follow Drainage Design and Construction Standards.
- 13.1.2** Storm water management lakes (wet ponds) must be naturalized within the 1:5 year flood line, and naturalization is encouraged above the 1:5 year flood line when appropriate according to design and ecological function.
- 13.1.3** Constructed wetlands, wet ponds and areas surrounding new storm water management facilities must be graded, topsoiled, seeded or sodded, and landscaped by the Developer to the satisfaction of the Director/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** Public lands within the facility must be planted with a minimum of 70 trees per hectare. In wet ponds this area will be calculated from above the Normal Water Level.
- 13.1.6** 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 the Director/Parks. These trees will be credited towards the required number.
- 13.1.7** Shrubs shall be massed within planting beds above the 1:5 year flood level to create major focal areas in the slopes of the pond. It is recommended that trees are positioned within mulched planting beds.
- 13.1.8** As per Drainage Design and Construction Standard for constructed wetlands natural vegetation should be established between the normal water line and high water line. A 2.5m mowed buffer must be kept along the residential fence line.
- 13.1.9** For storm water management lakes (wet ponds), naturalization as a landscape management technique should be used within the 1:5 year flood line, as well as within shrub beds above the 1:5 year flood line.
- 13.1.10** Mulch used in shrub and tree beds around storm water management facilities should be designed and managed in a way to allow for minimal disturbance during flood events.
- 13.1.11** No planting beds containing wood or bark mulch shall be allowed below the 1:5 flood level.
- 13.1.12** Rock mulch shall not be used within Constructed Wetlands and Storm Water Management Facilities. Refer to Specification 02914 Mulches.
- 13.1.13** 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 on a monthly basis.
- 13.1.14** Above the 1:5 year flood level, all planting beds are to have a minimum depth of 100mm wood chip mulch, reference Specification 02914 Mulches.
- 13.1.15** Major storm sewer outlets and inlets should be landscaped with plant materials and boulders to provide visual screening.
- 13.1.16** At the discretion of the Director/Parks, the above landscape requirements may be substituted in whole or in part with a naturalization design of equal value.
- 13.1.17** 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 the Director/Parks.
- 13.1.18** Special or unique features shall be designed by appropriate professionals and are subject to approval by the Director/Parks.
- 13.1.19** 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 Roadways Construction Detail 5160 Shared Use Path.
- 13.1.20** All SWMF's 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;and,
 - Resistance to pests.

- 13.2.3** See the latest edition of the City of Edmonton Low Impact Development Best Management Practices Design Guide for recommended plant species for LID facilities in Edmonton.
- 13.2.4** See the latest edition of the City of Edmonton Low Impact Development Construction, Inspection, and Maintenance Guide for guidelines on construction, inspection, CCC, FAC, and maintenance of LID facilities.

Appendix A

“Definition of Major and Minor Tree Deficiencies Memorandum”

June 1, 2015

TO: City of Edmonton and Land Development Industry

COPY: Sub-Committee reviewing: *Design and Construction Standards, Volume 5, Landscaping (September 2013 edition)*

FROM: Angella Vertzaya, P.Eng., M.Eng.
Parkland Developer Services – Urban Planning & Environment
Sustainable Development

SUBJECT: Definition of Major and Minor Tree Deficiencies

This memorandum outlines the 2015 trial period (June 1 – October 15) of identifying major and minor tree deficiencies during the CCC inspection process. This memorandum will be reviewed further in future updates of the Standards.

These are the minor tree deficiencies identified by Forestry during the CCC process. The deficiencies are listed as minor unless one of the deficiencies is a safety concern. If this is the case and the minor deficiency poses a safety concern, it will then be treated as a major deficiency.

Minor Deficiencies:

- Structural pruning, if structure is compromised during the CCC warranty period, the inspector may reject the tree at FAC
- Watering
- Weeding of the tree wells
- Straightening of tree stakes
- Painting of the tree stakes on replacement trees
- Topping up wood mulch
- Topping up of soil
- Picking up of garbage
- Removing flagging in the tree
- Installation of flagging tape on the tree stakes wires
- Re-construction of the soil ring

Major Deficiencies:

- All other deficiencies

If minor deficiencies are identified after September 1 (no major deficiencies) then a CCC certificate is issued and a re-check to ensure the minor deficiencies have been repaired, occurs on or before June 30th of the following year. The consultant/developer is required to contact Parkland Developer Services to inspect the site prior to this deadline.

Please share this information with your staff and please don't hesitate to contact me at 780-442-1183 with any questions or concerns.

Thank you,



Angella Vertzaya P.Eng. M.Eng.
Senior Project Manager
City of Edmonton
Parkland Developer Services – Urban Planning & Environment

Appendix B
“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 × 1465) is estimated for establishing a stand of 1000 trees per hectare. A 4 per cent

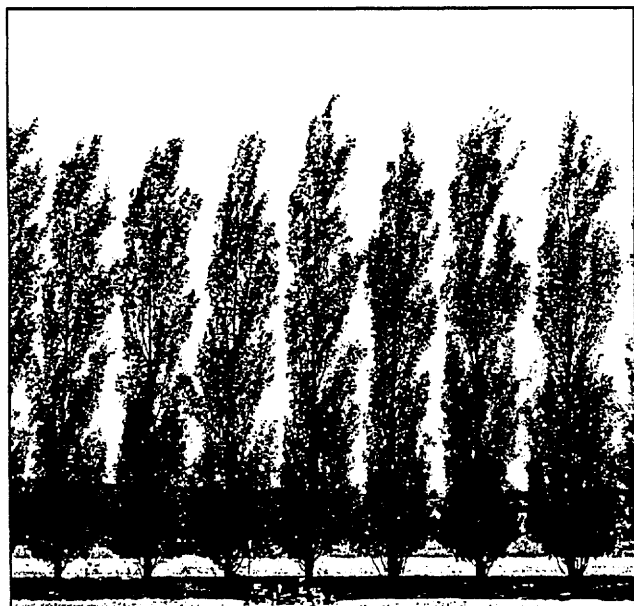


Figure 12. A single row shelterbelt of Tower Poplar is ideal for narrow areas, such as laneways or between fence and buildings.

(.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 \times \$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 \times \$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 \times 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 $\$734.38 + (170 \times \$1.79) = \$1038.68$. A farmstead belt with the same number of trees then can be valued at $\$734.38 \times 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 \times 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 \times 4 can be used.

Farmstead protection value where buildings and the home are protected is assigned a \$58.75/year-hectare value or \times 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) $1200 \times (17.5 \text{ m} \times 15) : 10,000 \times .1$

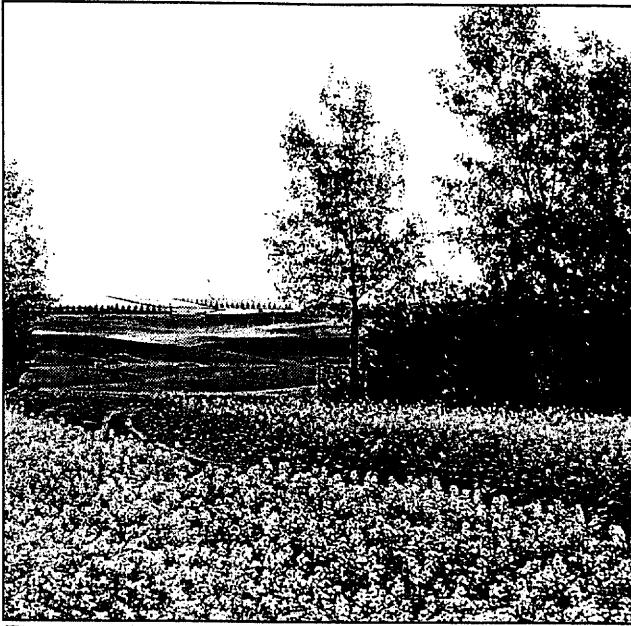


Figure 13. Shelterbelt on left with open spaces and gaps is far less effective than belt on the right.

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.

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

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.

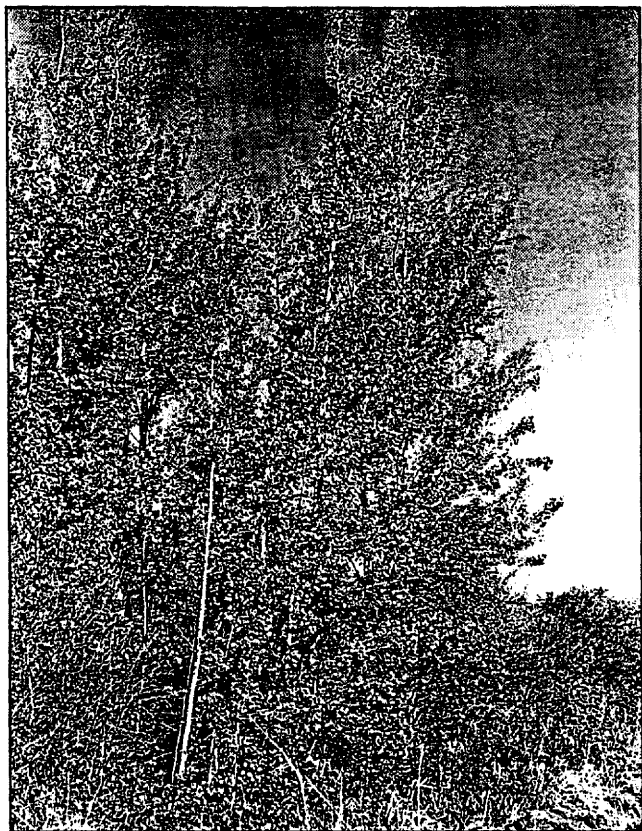


Figure 15. Typical natural area in Southern Alberta has Trembling Aspen as main species.

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.

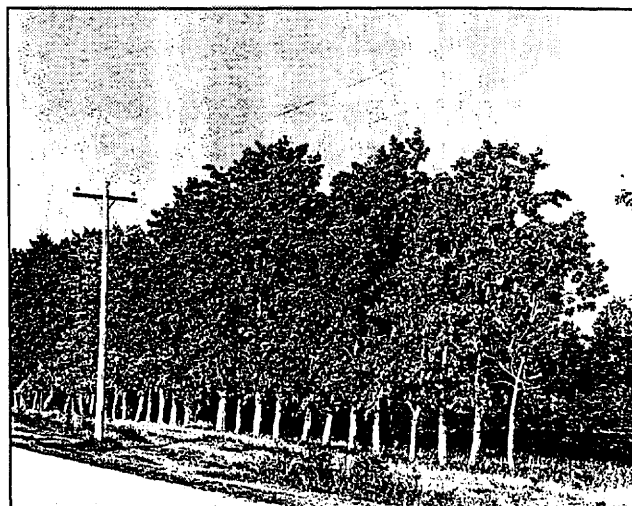


Figure 16. Farm woodlots need continued maintenance such as pruning to promote straight knot free stems.

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 measurment 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.

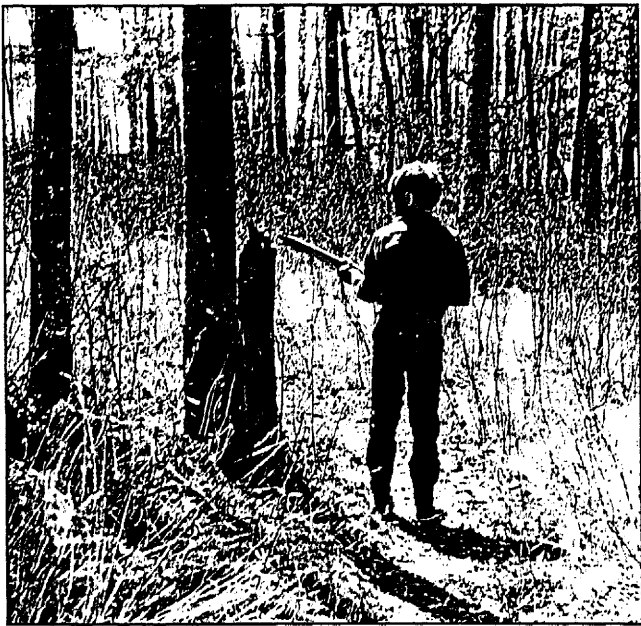


Figure 17. Natural sites have a variety of trees giving various shade densities. The shade has value to the child and the environment.

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.

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

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

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

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

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

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

$$= \$167,509.$$

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 C
“Corporate Tree Management Policy C456A”



CITY POLICY

POLICY NUMBER: C456A

REFERENCE:

City Council 28 November 1989
Community Standards Bylaw 14600
Parkland Bylaw 2202
Traffic Bylaw 5590
Natural Area Systems Policy C531
North Saskatchewan River Valley ARP
Natural Connections Strategic Plan
Integrated Pest Management C501
Urban Parks Management Plan

ADOPTED BY:

City Council
12 May 2010

SUPERSEDES:

C456

PREPARED BY: Asset Management and Public Works

DATE: 24 March 2010

TITLE: **Corporate Tree Management**

Page 1 of 1

Policy Statement: Trees are the longest living organisms on earth. Trees help purify the air we breath, contribute to urban biodiversity, provide wildlife habitat, beautify and enrich our lives throughout the year, sequester carbon and provide a sense of well-being in our urban environment. Therefore, these valuable assets require our dedicated stewardship.

Edmonton's tree canopy, including all ornamental trees and natural treed areas on City property (with the exception of land which is under the jurisdiction of senior orders of government), will be procured, maintained, protected and preserved by the City.

Where damage to or loss of City trees occurs, as a result of not complying with the City Guidelines, equitable compensation for that loss will be recovered from the civic or private entity causing the damage or loss and applied to future tree replacements.

Work on City trees will be in accordance with the applicable bylaws and policies referenced above concerning boulevards, utility lots, and City trees on any public place and City properties (with the exception of land which is under the jurisdiction of senior orders of government) within Edmonton.

The purpose of this policy is to protect the tree canopy on City property by:

Ensuring the orderly development of the City's tree inventory through new plantings, replacement plantings, and proper maintenance in accordance with applicable bylaws.

Ensuring that all trees on City properties are adequately protected from destruction, loss or damage. Where salvage is not possible, equitable compensation will be provided to the City of Edmonton.

Providing for a tree reserve account that enables the carry forward of funds received for tree losses and/or damages. These funds will be used for planting trees on City property in the future.

Coordinating all City tree planting programs including boulevards, roadway landscaping, park and facility developments.

This policy is subject to any specific provisions of the Municipal Government Act or other relevant legislation or Union Agreement.



CITY PROCEDURE

POLICY NUMBER: C456A

AUTHORITY: City Manager

EFFECTIVE DATE: 18 May 2010

TITLE: Corporate Tree Management

Page 1 of 3

1. DEFINITIONS

- 1.01 City Trees means all trees and shrubs growing on City-owned property. This includes trees and shrubs that have been planted on boulevards, lanes, sidewalks and road right-of-ways or any other public places.
- 1.02 Ornamental Trees means all planted landscape trees and shrubs growing on City-owned property.
- 1.03 Natural Treed Areas means those trees occurring as a result of natural succession or those trees planted as part of naturalization efforts, growing on City-owned property.
- 1.04 Windbreaks/Shelterbelts trees and/or shrubs either planted or naturally occurring for the purpose of providing environmental protection to property.
- 1.05 Parkland means any property, whether developed or not, owned, controlled or maintained by the City as defined in Bylaw #2202 (Parkland Bylaw).
- 1.06 Equitable Compensation
- (a) For ornamental and parkland trees means all costs incurred by the City. These costs shall include labour, material, equipment charges and applicable overheads associated with the asset value of the tree or the diminishment of the tree's asset value, as determined by the document titled *Guidelines for Evaluation of Trees*, a documented methodology that is set forth in the current edition of the Guide for Plant Appraisal authored by the Council of Tree and Landscape Appraisers and published by the International Society of Arboriculture.
- (b) For natural treed areas means the compensation value for such treed areas as determined by the document titled *the Tree Evaluation Method for Natural Stands in Our Urban Environment (Tree Canopy Replacement Method)*, a methodology document that was adapted with reference to the Alberta Agriculture publication, A Guide to Determining Replacement Value of Trees and Shrubs in Alberta, Section 3 (AGDEX 275/33-3).
- (c) For Windbreak and Shelterbelt trees, means the compensation for such treed areas as determined by Alberta Agriculture in A Guide to Determining Replacement Value of Trees and Shrubs in Alberta, Section 2.
- 1.07 Additional Costs covers additional and unplanned maintenance and costs associated with 'out of the season' tree relocation or repair or custom work above normal standards or outside of regular schedules.



CITY PROCEDURE

POLICY NUMBER: C456A

AUTHORITY: City Manager

EFFECTIVE DATE: 18 May 2010

TITLE: Corporate Tree Management

Page 2 of 3

2. PROCEDURES

1. The General Manager of Asset Management and Public Works to:

- 1.1. Prepare and authorize such instruction or specification necessary to properly implement the requirements of this policy:
 - 1.1.1. supply guidelines on tree protection methods and procedures
 - 1.1.2. supply guidelines on practices and procedures to reduce or eliminate harm to trees
 - 1.1.3. develop an annual training program for staff of and contractors to other civic entities
- 1.2. Request the necessary resources and provide the direction that may be required to meet the obligations of this policy. Develop and recommend an appropriate budget for the administration and implementation of the tree policy and the tree reserve account.
- 1.3. Inspect trees on City-owned property for possible damage and to ensure requirements are met prior to issuance of a Final Acceptance Certificate.
- 1.4. To ensure trees whose removal or relocation costs have been paid for by particular civic department, be relocated to another planned, planting area under the jurisdiction of the same department, where feasible.
- 1.5. Assist other departments in assessing the monetary value of natural tree stands, windbreaks, or shelterbelts located outside of parkland. Natural tree stand evaluations shall be in accordance with the *Canopy Replacement Method*.
- 1.6. Attempt to integrate existing natural tree stands, windbreaks, or shelterbelts, into future park developments.
- 1.7. Review plans for projects that impact City trees and determine the steps necessary to protect and preserve these trees.
- 1.8. Take necessary steps to protect and preserve City trees impacted by construction activities.

2. The General Manager of the Finance and Treasury Department to:

- 2.1. Establish a tree reserve account in accordance with the intent of this policy which enables the carry forward of collected funds for utilization in subsequent years.



CITY PROCEDURE

POLICY NUMBER: C456A

AUTHORITY: City Manager

EFFECTIVE DATE: 18 May 2010

TITLE: Corporate Tree Management

Page 3 of 3

- 2.2. Develop the necessary accounting structure mechanism for the implementation (including collection and disbursement of funds) of this policy.
- 2.3. Monitor the use of the tree reserve account and provide an annual statement to the Asset Management and Public Work department.
3. Department General Managers to:
 - 3.1. Ensure that Departments are aware of this policy, its intent and guidelines.
 - 3.2. Ensure that the requirement to comply with the tree protection, preservation, and replacement guidelines, is included in contract and tender packages under "special conditions."
 - 3.3. Ensure that department staff, including project managers, inspectors, and contractors to civic entities are annually trained in identifying and preventing tree damage.
 - 3.4. Ensure that department project managers and inspectors identify prospective tree damaging activities, and ensure protective measures are taken as outlined in the Asset Management and Public Works Parks Branch "Tree Protection Hoarding Requirements" and the "Guidelines for Working Near Trees" (attached).
 - 3.5. Identify major planned projects that may impact on trees on City property via the "On Street Construction and Maintenance" and other plan circulations.

Appendix D
“Top of Bank Policy C542”
“Development Setbacks from River Valley/ Ravine Crests”



CITY POLICY

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POLICY NUMBER: C542

REFERENCE:

City Council 26 February 1985

ADOPTED BY:

City Council 17 February 2010

SUPERSEDES:

Top-of-the-Bank Public Roadway Policy

PREPARED BY: Planning and Development Department

DATE: 20 January 2010

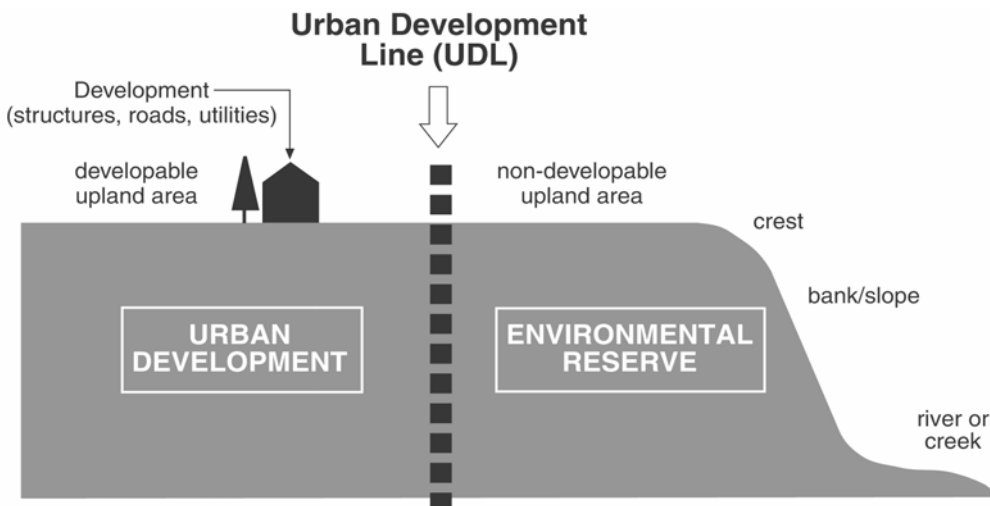
TITLE: **Development Setbacks From River Valley/Ravine Crests**

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.



CITY POLICY

Page 2 of 19

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

Page 3 of 19

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.



CITY POLICY

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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 used for municipal purposes fronting on a top of bank roadway (e.g. park) in new plan areas to ensure the objectives of this policy are achieved and to address the following factors:



CITY POLICY

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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.



CITY POLICY

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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

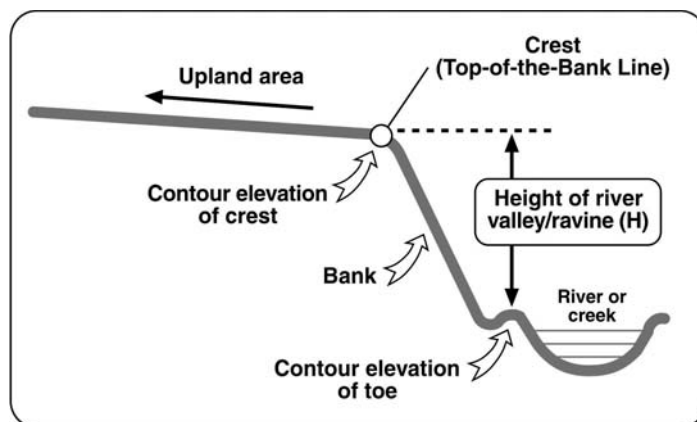
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DEFINITIONS

- 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.

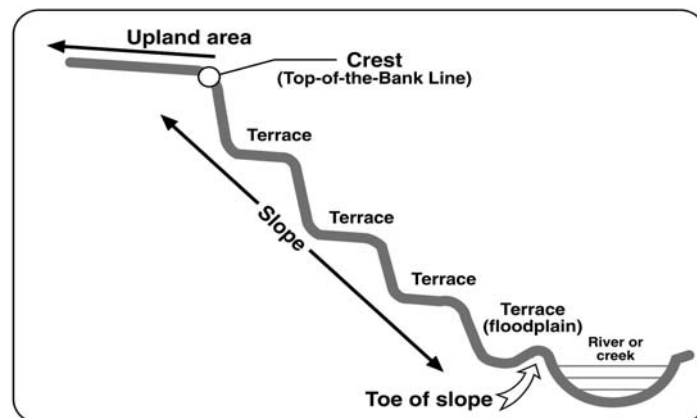
Abutting



- 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





CITY POLICY

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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.



CITY POLICY

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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:

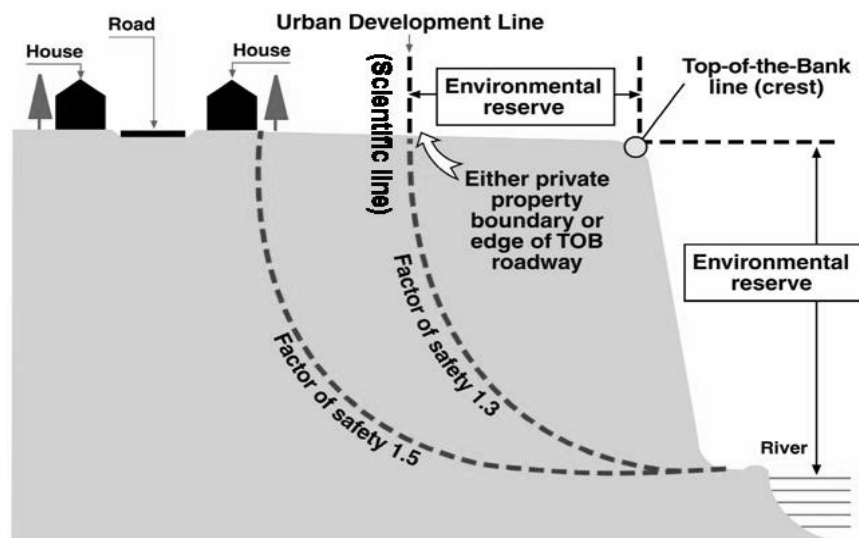
- (a) The upland area that is unstable and non-developable due to slope instability or other physical conditions as identified in the geotechnical assessment report and characterized by the Estimated Long Term Line of Stability;
- (b) The Upland Area that is non-developable due to other environmental 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.



CITY POLICY

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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.

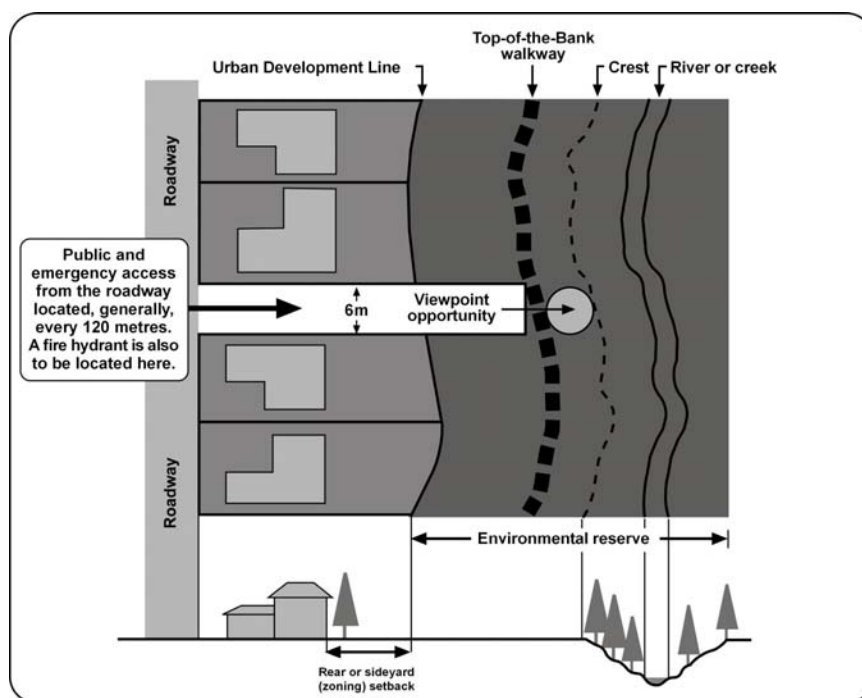


CITY POLICY

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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.



CITY POLICY

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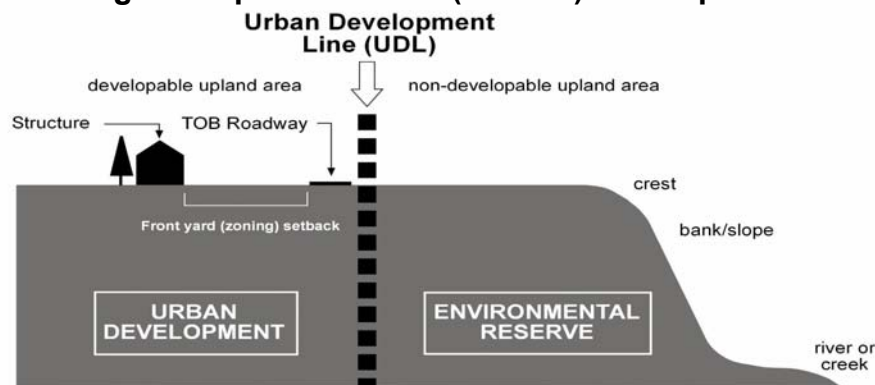
- 1.26 **Restrictive Covenant** means a legal instrument entered into by the property owner and the City which contains terms and restrictions on the use of the property which the property owner must abide by and may include the following:
- (a) That the City of Edmonton is not liable for any damages 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.



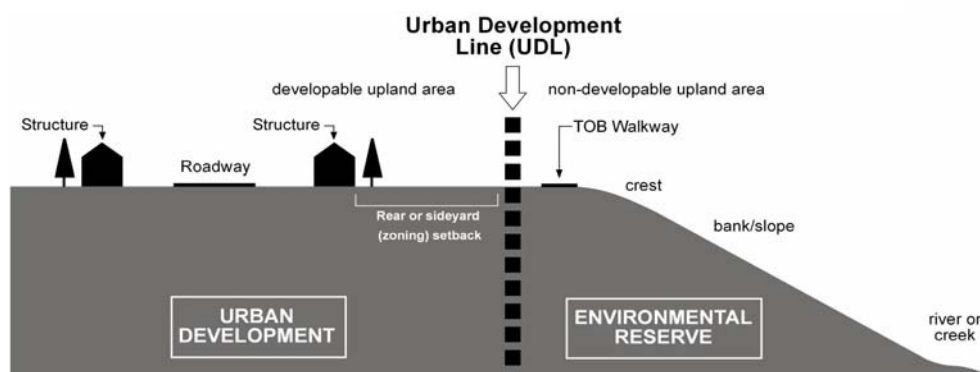
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- 1.30 **Top-of-the-Bank (TOB) Walkway** means a public walkway situated within the Upland Area, on the river valley/ravine side of the Urban Development Line, and aligned approximately, parallel to the adjacent Crest. This walkway will be situated 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.

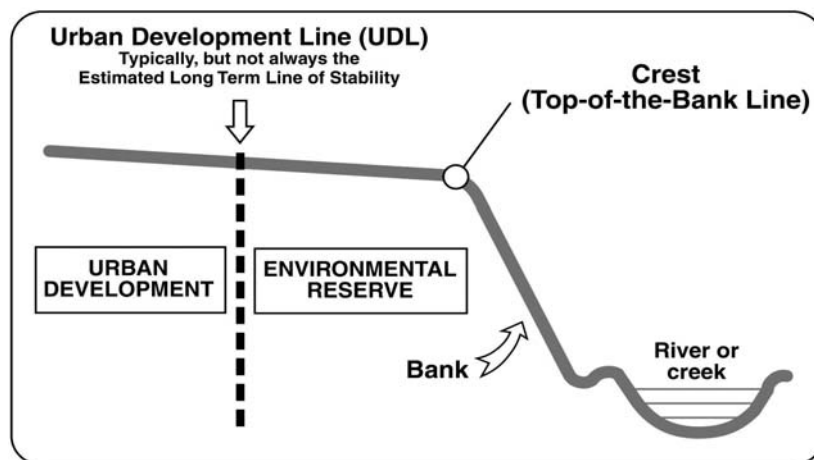


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Figure 8.

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.

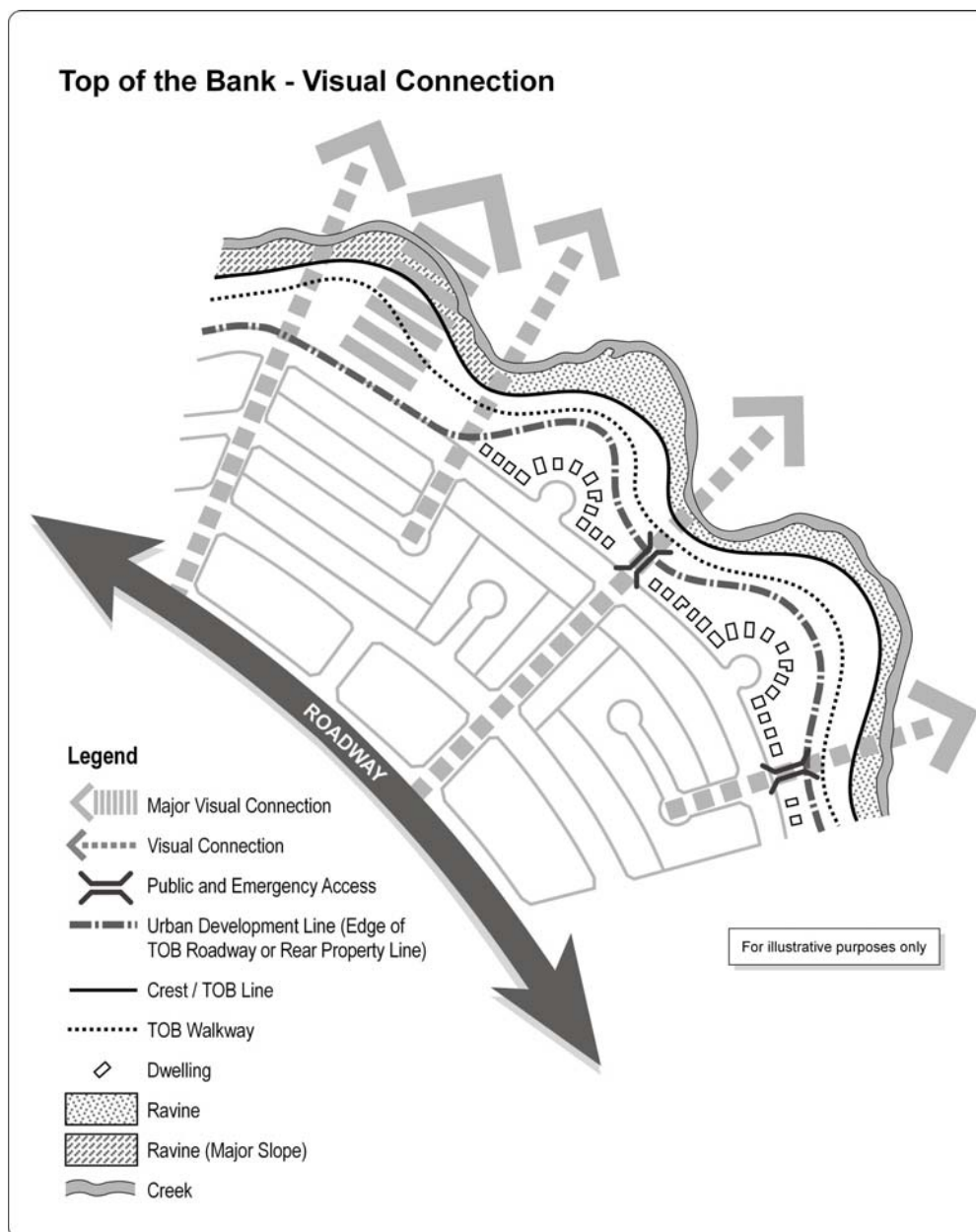


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1.34 **Visual Connection** means the cumulative visual experience and relationship between the Upland Area and River Valley and Ravine System perceived by an observer. See Figure 9.

Figure 9.
Visual Connection





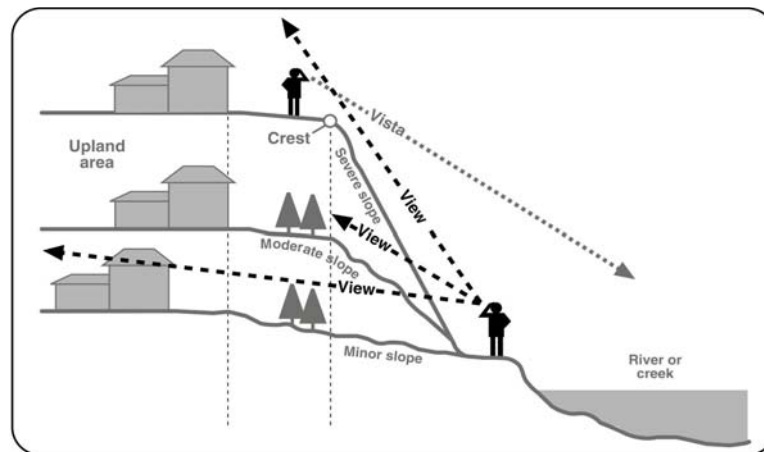
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- 1.35 **Vistas and Views** means the visual appreciation of the River Valley and Ravine System taken from the Upland Area (vista) and below the Crest within the river valley or ravine (view), by an individual. See Figure 10.

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".



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2. AREA OF APPLICATION

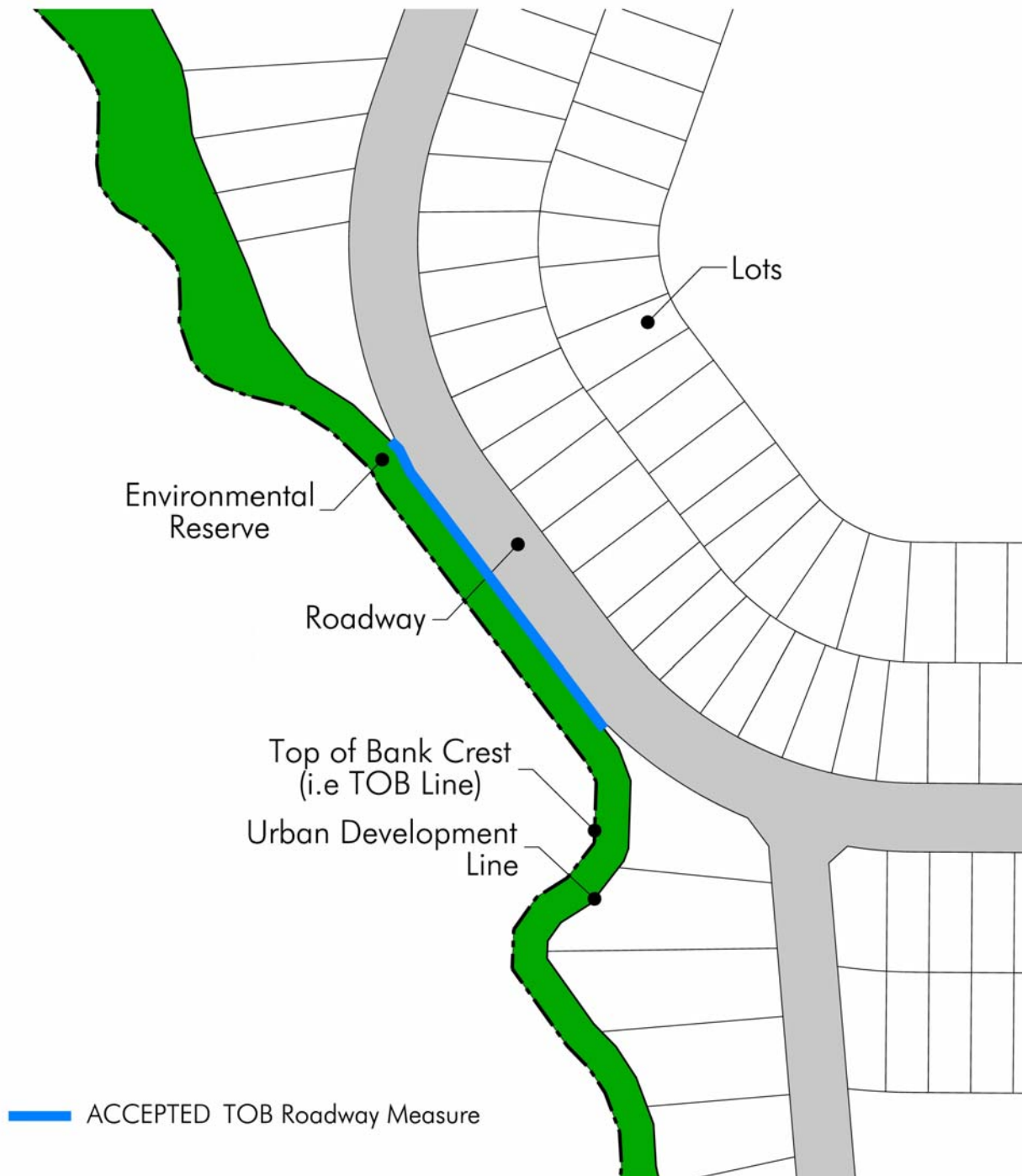
This Policy applies to Upland Areas Abutting the uppermost Crest of the North Saskatchewan River Valley and Ravine System. Most though not necessarily all of the river valley and ravine system in Edmonton is located found within the boundaries of the North Saskatchewan River Valley Area Redevelopment 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.



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



Top of Bank Roadway Measurement

February 2010



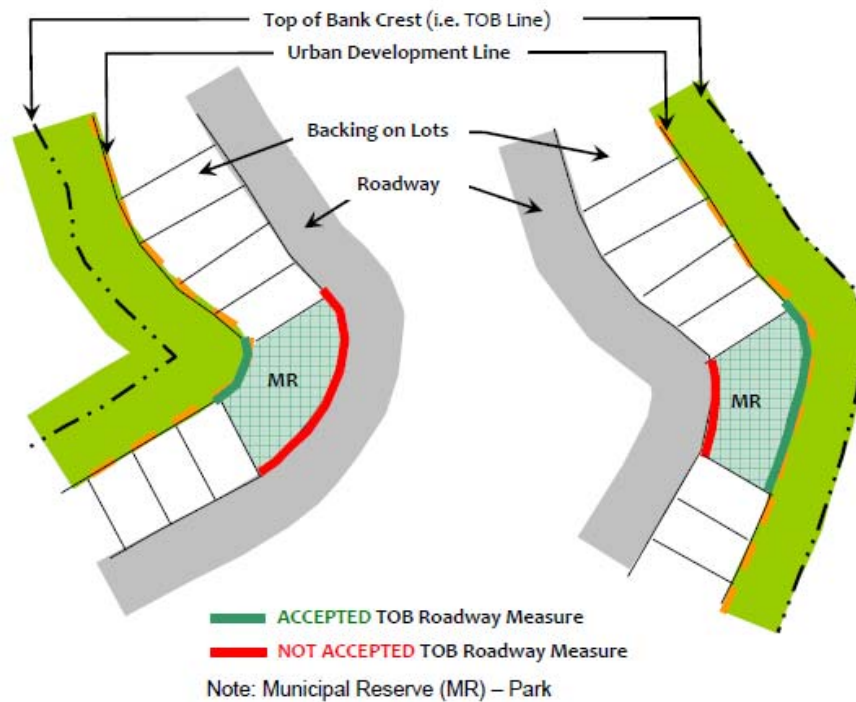
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4. SCHEDULE B - Top of Bank Roadway Measurement

Schedule "B"

TOB ROADWAY MEASUREMENT



Appendix E
“Change Request Form”

| CHANGE REQUEST FORM | | | |
|---|-------|------------------|-------|
| Requestor Information | | | |
| Company: | _____ | Requestor Name: | _____ |
| Date Requested: | _____ | Requestor Title: | _____ |
| Email Address: | _____ | Phone Number: | _____ |
| 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: _____ | Request Number: _____ |
| Result: <input type="checkbox"/> Approved <input type="checkbox"/> Not Approved | |
| Reason: (for not approving or deferring) | |
| Date Approved: _____ | Director Signature: _____ |

**Appendix F
“Revision Log”**

2016 Revision Log

| 2015 CLAUSE | APPROVED CHANGE IN 2016 STANDARDS |
|---|---|
| <p>1. 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 is encouraged.</p> | <p>1. 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 is encouraged. The landscape must take into account the maintenance standards the City of Edmonton adheres to.</p> |
| | <p>NEW BULLETS UNDER CLAUSE 3.2.1 City of Edmonton Low Impact Development, Construction, Inspection & Maintenance Guide -Trees and Shrubs for the Prairies (by Landscape Alberta, 780-489-1991, admin@landscape-alberta.com): latest edition, takes precedence if sizes/spreads are in conflict with other documents; -City of Edmonton, Winter Design Guidelines: Transforming Edmonton into a Great Winter City; - 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.</p> |
| <p>3.2.1 The following documents are a source of additional information...</p> <ul style="list-style-type: none"> -Standard Sportsfield Sizes; (Community Services internal document – contact a Landscape Architect/Parks); | <p>Removal of reference.</p> |
| | <p>Add the following reference to section 3.2.1 Canadian Standards for Nursery Stock, Canadian Nursery Landscape Association (C.N.L.A);</p> |
| | <p>NEW CLAUSE 3.3.27 Low Impact Development (LID): is a land development and storm water management approach that works with nature to manage storm water as close to the source as possible. LID focuses on maintaining and restoring the natural hydrological processes of a site.</p> |

| 2015 CLAUSE | APPROVED CHANGE IN 2016 STANDARDS |
|---|---|
| <p>4.2.1 The horticultural and bioengineering components of the design take into consideration factors such as micro-climate, soil conditions, hydrology, slope stabilization, erosion control, successive plant growth, wind buffering, visual screening and control of pedestrian circulation.</p> | <p>4.2.1 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, wind buffering, visual screening and control of pedestrian circulation.</p> <ul style="list-style-type: none"> - NEW: Consideration shall be taken for visual interest, wind blocking and shadow casting in winter. - NEW: The proposals address four season design and use, ensuring that any gathering spaces work well in both winter and summer seasons. |
| <p>4.5.1 Inspections for Landscape Construction Completion Certificates (CCC) will be undertaken by Parks from June 1st - October 15th, based on snow coverage and weather dependent.</p> <ul style="list-style-type: none"> - Projects out of Parkland Developer Services Unit's scope will include a Parks Operations inspector. | <p>4.5.1 Parkland Developer Services Unit's inspections may include Parks Operations, Urban Forestry, Ecology, or other Edmonton representatives as required to complete the inspection.</p> |
| | <p>NEW BULLET UNDER CLAUSE 4.5.2</p> <p>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</p> |
| | <p>NEW BULLET UNDER CLAUSE 4.5.7</p> <p>-City assets that only require a CCC will require the following documents to be submitted at time of CCC application: latest approved landscape drawings (PDF and AutoCAD) and a Tangible Capital Asset form.</p> |
| <p>4.5.10 The Urban Forester will inspect all trees including containers and plugs. All plant material must be visible.</p> | <p>4.5.9 The Urban Forester will inspect all trees on site. All plant material must be visible.</p> |

| 2015 CLAUSE | APPROVED CHANGE IN 2016 STANDARDS |
|---|---|
| <p>4.5.11 The Landscape Architectural Technologist/Parks will supply an approved CCC or a rejected CCC with a deficiency report, within two weeks of the inspection to the Landscape Architect.</p> | <p>4.5.11 The Landscape Architectural Technologist/Parks or Project Manager will supply a CCC deficiency report within two weeks of the inspection to the Landscape Architect.</p> <ul style="list-style-type: none"> -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. <p>RELATED NEW CLAUSE</p> <p>3.3.5 Landscape Architectural Technologist/Parks: the person within City Planning designated by the General Manager, Sustainable Development Department. Responsible for coordinating the inspections and issuance of Landscape Construction Completion Certificates and Final Acceptance Certificates.</p> |
| <p>4.5.13 Bank stabilization inspection of plant material requirements must be inspected by Parks to ensure plant material is viable and as per the drawing.</p> | <p>4.5.13 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.</p> |
| | <p>NEW CLAUSE</p> <p>4.7.2 Municipal Reserve that only requires a Construction Completion Certificate (CCC) shall require an AutoCAD version of the Approved Drawing.</p> |
| <p>4.8.1 The Developer shall be responsible for any defect or deficiency in the completed work for a minimum warranty period as outlined below and shall remedy any deficiencies at their own expense.</p> | <p>4.8.1 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.</p> |

| 2015 CLAUSE | APPROVED CHANGE IN 2016 STANDARDS |
|---|--|
| <p>4.8.2 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:</p> <ul style="list-style-type: none"> -For sites with more than 40 trees, 10% or more of the trees have been and are required to be replaced within the current year. -For sites with less than 40 trees, 25% or more of the trees have been and are required to be replaced within the current year. -At which time a new FAC application will be required. | <p>4.8.2 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:</p> <ul style="list-style-type: none"> -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 25% or more of the turf has not established. -At which time a new FAC application will be required. |
| | <p>NEW CLAUSE</p> <p>4.8.3 If trees that are planted are selected from the trial list then the following conditions apply at FAC:</p> <ul style="list-style-type: none"> - 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; - All boulevard trees need to be replaced. |

| 2015 CLAUSE | APPROVED CHANGE IN 2016 STANDARDS |
|---|--|
| <p>4.8.3 All deciduous trees specified at a 75 mm caliper, or greater, to a maximum of 90 mm 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.</p> | <p>4.8.4 All deciduous trees specified at 80 mm* caliper, or greater, to a maximum of 90 mm 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.</p> <p>-* 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.</p> <p>- If at the time of inspection trees are determined to be 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 4.8.3.</p> |
| <p>4.8.4 All landscape amenities shall be maintained for a minimum warranty period of twenty four months (i.e. benches, garbage/recycling receptacles, etc.).</p> | <p>4.8.5 All amenities shall be maintained for a minimum warranty period of twelve (12) months. (i.e. benches, garbage/recycling receptacles, etc.) The garage receptacles must be emptied to the City of Edmonton standards until FAC.</p> |
| | <p>NEW CLAUSE</p> <p>4.10.3 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.</p> |
| <p>4.10.4 The Landscape Architect shall submit a standard letter, three original copies of the Sustainable Development Department FAC form including all 11"x17" reductions of the As-Built or Red Line landscape drawings, Maintenance Log and Total Capital Assets Form, forwarding them to Development Coordination, Sustainable Development.</p> | <p>4.10.4 The Landscape Architect shall submit a standard letter, three original copies of the Sustainable Development Department FAC form including all 11"x17" reductions of the latest approved landscape drawings, As-built AutoCAD drawing, As-built PDF drawing, Maintenance Log and Total Capital Assets Form, forwarding them to Development Coordination, Sustainable Development. The Landscape Architect shall submit a standard letter, three original copies of the Sustainable Development Department FAC form including all 11"x17" reductions of the As-Built or Red Line landscape drawings, Maintenance Log and Total Capital Assets Form, forwarding them to Development Coordination, Sustainable Development.</p> |

| 2015 CLAUSE | APPROVED CHANGE IN 2016 STANDARDS |
|---|---|
| | <p>NEW CLAUSE</p> <p>4.10.5 The contractor shall provide all maintenance records for the site between CCC and FAC. This shall include standard maintenance tasks including dates when that maintenance occurred. Records shall also include pesticide application logs. Replacement tree and shrub planting must be indicated on drawings. These logs must be uploaded to Eplan as part of the supporting documents required for inspection to occur. This record must be provided with the inspection request.</p> |
| <p>4.10.12 If the trees are in the third growing season, the tree stakes and wires shall be removed.</p> | <p>4.10.13 If the trees are in the third growing season, one tree stake and all guy wires shall be removed.</p> |
| | <p>NEW CLAUSE</p> <p>4.10.14 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.</p> |
| | <p>NEW CLAUSE</p> <p>4.12 Pesticide Notification Requirements</p> <p>4.12.1 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.</p> <p>4.12.2 Developers shall provide signs indicating that areas have received herbicide treatments wherever there is a potential for public exposure. Reference Appendix G, “Pesticide Notification Signage Template”.</p> <p>4.12.3 A 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.”</p> |

| 2015 CLAUSE | APPROVED CHANGE IN 2016 STANDARDS |
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| | <p>NEW CLAUSE</p> <p>4.13 Environmental Considerations</p> <p>4.13.1 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:</p> <ul style="list-style-type: none"> -Consultants hired by the City of Edmonton, -Any person who is hired by the City to provide Construction, Operation, Maintenance and Service activities; -Any person who is hired by the City and who operates hired equipment. <p>4.13.2 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.</p> |
| <p>5.1.1 All plans shall contain a scale including a bar scale, a north arrow and a legend. Where possible, orient north to the top of the drawing.</p> | <p>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.</p> |
| <p>5.2.4 The layout plan shall include all grading and drainage information as follows:</p> <ul style="list-style-type: none"> -Proposed contours 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. | <p>5.2.4 The layout plan shall include all grading and drainage information as follows:</p> <ul style="list-style-type: none"> -Proposed contours at a maximum of 1.0 m 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. |

| 2015 CLAUSE | APPROVED CHANGE IN 2016 STANDARDS |
|--|--|
| <p>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:</p> <ul style="list-style-type: none"> - Trees and shrubs to be protected as per the City of Edmonton Corporate Tree Management Policy. | <p>NEW BULLET UNDER CLAUSE 5.2.5</p> <ul style="list-style-type: none"> - Trees and shrubs to be protected as per the City of Edmonton Corporate Tree Management Policy, C456A. |
| | <p>5.3.2 If possible storm water management drawing should be drawn at a scale that allows trees and shrubs to be shown on the same sheet.</p> <ul style="list-style-type: none"> - The SWMF drawings will include an overall landscape plan identifying the planting calculations, surface treatments with areas, 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. |
| | <p>NEW BULLET UNDER CLAUSE 5.5.3</p> <ul style="list-style-type: none"> -Where existing trees are identified and used to meet quantity requirements on planting plans, they must be included within the plant list and be subject to CCC and FAC inspection. |
| <p>5.5.7 Plant material graphic symbols shall represent mature spread of shrubs as per Plant material graphic symbols shall represent mature spread of shrubs as per Alberta Yards and Gardens (see Section 3.2.1 Reference Documents). All shrub and coniferous tree material symbols shall be contained within a planting bed, with a minimum 500 mm width mulched area between the edge of the mature shrub/coniferous tree and the edge of the shrub bed. Shrub symbols should be shown at mature size with no overlap.</p> | <p>NEW CLAUSE</p> <p>5.5.7 Plant material graphic symbols shall represent mature spread of shrubs as per Trees and Shrubs for the Prairies (see Section 3.2.1 Reference Documents).</p> <p>5.5.8 Tree symbols are to be drawn at mature spread, as per the recommended tree spacing in 7.9 Approved Tree Species and Spacing Requirements.</p> <p>5.5.9 Shrub symbols should be shown at mature size with no overlap. Tree and ground covers symbols may be overlapped at the discretion of the City.</p> <p>5.5.10 All shrub and coniferous tree material symbols shall be contained within a planting bed, with a minimum 500 mm width mulched area between the edge of the mature shrub/coniferous tree and the edge of the shrub bed.</p> |
| <p>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.</p> | <p>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.</p> |

| 2015 CLAUSE | APPROVED CHANGE IN 2016 STANDARDS |
|---|---|
| <p>7.2.1 Naturalization is encouraged as a means to provide more sustainable landscapes, to enhance biodiversity, and to provide educational opportunities.</p> | <p>7.2.1 The City of Edmonton is moving towards a more naturalized landscape aesthetic in the following areas: major roadways, utility corridors, non-programmable or low use park spaces, shrub beds in appropriate areas (e.g. nature parks or parks near natural areas/river valley), low impact development (e.g. bioswales and rain gardens), and storm water management facilities. Naturalization is supported by the City of Edmonton as a means to provide more sustainable landscapes, to enhance biodiversity, and to provide educational opportunities.</p> |
| | <p>NEW CLAUSE 7.1.4 Soil Volume 7.1.4.1 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.</p> <ul style="list-style-type: none"> - Large canopy trees are defined as trees that under normal conditions can support canopies of 74m² or spread of over 5 meters and require a minimum soil volume of 17m³. - Small canopy trees are defined as trees that under normal conditions have a spread of 5 meters and require a minimum soil volume of 11m³ and under ideal conditions require 17m³ to reach its full potential. - Should the design of the area not allow for the minimum required soil volume, please contact the Forestry for recommendations. |
| <p>7.2.2 Naturalization may be considered where there are no conflicts with other uses, where aesthetically appropriate, maintenance concerns are addressed, and where there is public acceptance.</p> | <p>7.2.2 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.</p> |
| <p>7.3.1 Collector and arterial roadways must incorporate a utility-free planting corridor within boulevards and medians to accommodate planting requirements with appropriate setbacks.</p> | <p>7.3.1 Collector and arterial roadways must incorporate a utility-free planting corridor within boulevards and medians to accommodate planting requirements with appropriate setbacks. If trees are on the plan and cannot be planted due to utility or access conflicts, these trees should be planted where possible within the same stage of development.</p> |
| <p>7.5 Tree Setbacks from Walkways and Roads</p> | <p>7.5 Tree Setbacks from Walkways and Roads - New table</p> |
| | <p>NEW CLAUSE 7.5.2 There shall be no mulched beds within 2.5m of curb on boulevards along arterial and collector roadways.</p> |

| 2015 CLAUSE | APPROVED CHANGE IN 2016 STANDARDS |
|---|--|
| <p>7.6.9 Planting bed locations should accommodate the use of large turf maintenance equipment. Provide a minimum 2.5 m clearance between the edge of a bed and obstructions such as fencing, furniture, buildings, etc. 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.</p> | <p>7.6.9 Planting bed locations should accommodate the use of large turf maintenance equipment. Provide a minimum 2.5 m clearance between the edge of a bed and obstructions such as fencing, furniture, buildings, individual trees etc. 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.</p> |
| | <p>NEW CLAUSE 7.6.10 Where there is turf between planting beds and adjacent fences the minimum distance shall be 2.5 m.</p> |
| <p>7.6.6 Setbacks for coniferous trees are to be no less than the distances indicated above, but will be reviewed and approved on a case by case basis in regard to concerns over potential mature size.</p> | <p>7.6.6 Setbacks for coniferous trees are to be no less than the distances indicated above, but will be reviewed and approved on a case by case basis in regard to concerns over potential mature size. Coniferous trees must maintain clearance from fence lines at maturity.</p> |
| <p>7.6.8 Shrub setbacks from shrub bed edges shall reflect mature diameter with the entire shrub contained in the bed. Mature spread cannot encroach on the sidewalk or onto fences</p> | <p>7.6.8 Shrub setbacks from shrub bed edges shall reflect mature diameter with the entire shrub contained in the bed. Mature spread cannot encroach on the sidewalk or onto fences. There must be 500 mm from the edge of the bed or fence or sidewalk from the mature spread of the shrub.</p> |
| <p>7.6.10 On drawings, shrub symbols should be shown at mature size with no overlap. The intent is to achieve a balance between aesthetic impact, shrub health and maintenance concerns.</p> | <p>7.6.11 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.</p> |
| | <p>NEW CLAUSE 7.6.12 There shall be a minimum 3.0m planting setback of shrubs from play space envelope (playground equipment and splash parks). The design preference is naturalized planting. 7.6.13 There shall be no shrub beds within 30m of a school playground site. The design preference is naturalized planting.</p> |

| 2015 CLAUSE | APPROVED CHANGE IN 2016 STANDARDS |
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| <p>7.7.1 Unless noted otherwise or approved by the Director/ Parks, all planting shall be a minimum of 50 mm caliper for deciduous trees and 2.5 m height for Coniferous trees. A tree mix of deciduous and coniferous is generally encouraged where practical.</p> | <p>7.7.1 Unless noted otherwise or approved by the Director/ 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.</p> |
| | <p>NEW CLAUSE 7.7.2 If proposed trees are less than the minimum caliper, additional plant material may be required, at the discretion of the City.</p> |
| <p>7.7.2 75 mm 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 Forestry five business days prior to tree root trenching. If tree root trenching in boulevards is not proposed for trees 75 mm caliper and larger, then a 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.</p> | <p>7.7.3 80 mm 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 Forestry 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 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.</p> |
| | <p>NEW CLAUSE 7.8.5 Where naturalization planting is use, plant material may be substituted as per the following: (NEW TABLE) - A maximum of 10% of the required 60mm caliper trees on a site may be substituted for smaller material. - Emergent material does not qualify into the shrub or tree equivalency. - Shrub size requirement can be substituted at a rate of 5 shrub plugs for 1 full size shrub - Example: One 60 mm caliper full size tree can be substituted with either two, 40 mm caliper potted trees, or five 20 mm caliper potted trees or 25, 100 mm pot (tree or shrubs, whips and plugs)</p> |

| 2015 CLAUSE | APPROVED CHANGE IN 2016 STANDARDS |
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| <p>7.9 Approved Tree Species and Spacing Requirements</p> <p>7.9.1 Forestry and Parks have developed a list of acceptable tree species with recommended spacing, 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.</p> <p>7.9.2 Trees from the list below 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 below.</p> | <p>7.9 Approved Tree Species, Spread and Spacing Requirements</p> <p>7.9.1 Forestry and Parks have developed a list of acceptable tree species with recommended spacing and spread, Appendix H Approved Tree 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.</p> <p>7.9.2 Trees identified in Appendix H “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 below.</p> |
| <p>7.9.3 Coniferous tree spacing may be reduced when planted in groups and placed in mulched beds. Tree spacing and species selections must address safety and security concerns.</p> | <p>7.9.3 When grouping Coniferous trees, place trees in mulched beds with appropriate spacing as per the above recommended tree spacing.</p> <p>NEW CLAUSE</p> <p>7.9.4 Tree spacing and species selections should consider site specific CPTED principles and sightline concerns.</p> |
| <p>7.12 Hoarding</p> <p>7.12.1 Where sod will not be placed until completion of all construction activities, hoarding of boulevard trees is required. Reference City of Edmonton details LA100- Large Tree Hoarding and LA101- Small Tree Hoarding (maximum 75 mm caliper). The Landscape CCC may be granted without sod being installed.</p> <p>7.12.2 All hoarding is to be removed by the Developer, after issuance of the FAC by Parks, unless otherwise directed.</p> | <p>7.12 Tree Protection Zone</p> <p>7.12.1 Where sod will not be placed until completion of all construction activities, protection of boulevard trees is required. Reference City of Edmonton details LA100 - Large Tree “Tree Protection Zone” and LA101 - Small Tree “Tree Protection Zone” (maximum 80 mm caliper). The Landscape CCC may be granted without sod being installed, on local road boulevards.</p> <p>7.12.2 All tree protection zones are to be removed by the Developer, after issuance of the FAC by Parks, unless otherwise directed.</p> |

| 2015 CLAUSE | APPROVED CHANGE IN 2016 STANDARDS |
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| | NEW CLAUSE 7.13.2 Aquatic invasive species shall be controlled as per the Fisheries (Alberta) Act. |
| 8.2.4 The concrete pad should extend 150 mm beyond the outside edges of the site furniture to accommodate mowing. | 8.2.4 All amenities must be place on a concrete pad or secured with a concrete footing. - The concrete pad should extend 150 mm beyond the outside edges of the site furniture to accommodate mowing. |
| 8.2.3 A minimum required setback distance for site furniture, measured from the outer face of the amenity, are as follows: - Benches - 1.0m minimum from back of walkway. - Waste Receptacles - 250mm minimum from walkway and minimum 4.0m from benches. - Picnic Tables - 1.0m minimum from back of walkway. | 8.2.3 Minimum required setback distances for site furniture, measured from the outer face of the amenity, are as follows: - Benches - 1.0 m minimum from back of walkway. - Waste Receptacles – 600 mm minimum from walkway and minimum 3.0 m from benches. - Picnic Tables - 1.0 m minimum from back of walkway. |
| 8.4.1 School, park sites and other park site are to be separated from private development by permanent fencing. Fences must be constructed 150 mm inside private property. Fencing is to be a minimum 1.2 m height and suitable for restraining pets. | 8.4.1 School, park sites and other park site 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. |
| BULLET UNDER CLAUSE 9.1.4 -Locate playgrounds centrally between Community League sites and schools are desirable. | NEW BULLET UNDER 9.1.4 -Locate playgrounds centrally between Community League sites and schools are desirable. Where ever possible, playgrounds should also have visual connection to any publically accessible heated areas/structures but not be in their shadow in winter. |
| 9.3.1 All new or upgraded playgrounds must meet the current CSA Z614 - Children’s Playspaces and Equipment Standards. The Landscape Architect must contact a Landscape Architect/Parks or Project Manager/Parks prior to proceeding with design work. | 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 Designs for playgrounds and play areas that are innovative and provide a diversity of play and learning experiences are encouraged. | NEW BULLET UNDER 9.3.2 -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 City of Edmonton Playground Equipment Standard. |

| 2015 CLAUSE | APPROVED CHANGE IN 2016 STANDARDS |
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| 10.2.2 Shrubs and trees may be planted on traffic calming islands with approval by Transportation Services and the Director/Parks. Shrubs must be low growing, with a maximum 500 mm height. | 10.2.2 Shrubs and trees may be planted on traffic calming islands with approval by Transportation Services and the Director/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. |
| 10.2.3 Shrubs and trees may be planted along the fence at neighbourhood entrances with approval by Transportation Services and the Director/Parks. | 10.2.3 Shrubs and trees may be planted along the fence at neighbourhood entrances with approval by Transportation Services and the Director/Parks. The mature shrubs spread must be 500 mm back from the fence and not be a suckering species. |
| 10.4.1 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. | 10.4.1 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 should be used in appropriate locations, using the appropriate grass, shrub and tree species. Reference Section 7.2 Naturalization. |
| 10.4.11 On existing arterial roadways, the arterial roadway standards shall be applied when the arterial is upgraded to its ultimate cross section. Allowance shall be made for conflicts with existing utilities. | 10.4.10 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. |
| 10.4.13 Naturalization designs for arterial R.O.W. may be considered in appropriate locations, reference Section 7.2, Naturalization. | 10.4.12 Naturalization designs for arterial R.O.W. should be used in appropriate locations. Reference Section 7.2 Naturalization. |
| 10.4.4 There will be a row of shrubs at 1.2 m spacing in a shrub bed behind the walkway on each side of the arterial. | 10.4.4 There will be a row of shrubs at 1.2 m spacing in a shrub bed behind the walkway on each side of the arterial. Perennials, ground covers, and tree plantings may be substituted at an equivalent rate, or plant quantities may be adjusted to meet the mature spread requirements of the proposed plant material as determined by the Director of Parks. |

| 2015 CLAUSE | APPROVED CHANGE IN 2016 STANDARDS |
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| 10.5.1 Arterial roads in industrial areas require landscaping as per arterial requirements above. The shrub requirement will be evaluated on a case-by-case basis by the Director/Parks dependent on the existence of frontage landscaping by adjacent owners. It is anticipated that most industrial area arterials will require shrub planting. | 10.5.1 Arterial roads in industrial areas require landscaping as per arterial requirements above. The shrub requirement will be evaluated on a case-by-case basis by the Director/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 7.2 Naturalization. |
| 10.5.2 Non-arterial roads of 20 m or greater R.O.W. width in industrial areas are considered to be collectors, and require a row of trees on each side – spaced as per Forestry recommendations | 10.5.2 Arterial and collector roads in industrial areas require a row of trees on each side, spaced as per Forestry recommendations. 10.5.3 Local industrial roads require five trees per side, extending back from an intersection with a collector or an arterial. Adjust utilities as required. |
| 10.8.1 All road islands, medians and entry feature designs must be low maintenance. Where appropriate, designs shall include trees, shrubs, groundcovers, mulch and sod to the satisfaction of the Director/Parks. | 10.8.1 All road islands, medians and entry feature designs are encouraged to be low maintenance. Where appropriate, designs shall include trees, shrubs, groundcovers, mulch, sod and boulders to the satisfaction of the Director/Parks. Shrubs must be low growing with a maximum mature height of 750 mm. A 500mm concrete verge is required on either side of the bed. |
| 10.4.7 A minimum 1.25 m buffer strip is required on either side of the median and mature plant material shall not extend into the buffer strip (to accommodate snow storage and spring sediment removal). A hard surface apron may be substituted for the buffer at a lesser width, subject to approval by Transportation Services. If turf is specified, a minimum 1.5 m buffer strip is required. | 10.8.3 A minimum 1.25 m buffer strip is required on either side of the median and mature plant material shall not extend into the buffer strip (to accommodate snow storage and spring sediment removal). If turf is specified, a minimum 1.5 m buffer strip is required, the concrete verge may be included in this measurement. |
| 10.8.12 The required cross slope shall not be less than 2% from center of island to curb. | 10.8.4 The required cross slope shall not be less than 5% from center of island to curb. |

| 2015 CLAUSE | APPROVED CHANGE IN 2016 STANDARDS |
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| <p>13.1.1 Constructed wetlands, wet ponds and areas surrounding new storm water management facilities must be graded, topsoiled, seeded or sodded, and landscaped by the Developer to the satisfaction of the Director/Parks.</p> | <p>NEW CLAUSES</p> <p>13.1.1 The City of Edmonton is moving towards a more naturalized landscape aesthetic in certain areas. Constructed storm water wetlands are human-made systems, designed, constructed and operated to emulate natural wetlands or many of their biological processes. Constructed wetlands should follow Drainage Design and Construction Standards.</p> <p>13.1.2 Storm water management lakes (wet ponds) must be naturalized within the 1:5 year flood line, and naturalization is encouraged above the 1:5 year flood line when appropriate according to design and ecological function.</p> <p>13.1.7 Shrubs shall be massed within planting beds above the 1:5 year flood level to create major focal areas in the slopes of the pond. It is recommended that trees are positioned within mulched planting beds. Flood tolerant plant material may be located below the 1:5 flood level.</p> <p>13.1.8 As per Drainage Design and Construction standards for constructed wetlands natural vegetation should be established between the normal water line and high water line. A 2.5m mowed buffer must be kept along the residential fence line.</p> <p>13.1.9 For storm water management lakes (wet ponds), naturalization as a landscape management technique should be used within the 1:5 year flood line, as well as within shrub beds above the 1:5 year flood line.</p> <p>13.1.10 Mulch used in shrub and tree beds around storm water management facilities should be designed and managed in a way to allow for minimal disturbance during flood events.</p> |

| 2015 CLAUSE | APPROVED CHANGE IN 2016 STANDARDS |
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| <p>13.2 Constructed Wetlands, Storm Water Management Facilities</p> | <p>NEW CLAUSE</p> <p>13.2 Low Impact Development Facilities</p> <p>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.</p> <p>13.2.2 Select plant varieties that will thrive on the site conditions and that grow well together. Species selection should consider:</p> <ul style="list-style-type: none"> -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; -Resistance to pests. <p>13.2.3 See the latest edition of the City of Edmonton Low Impact Development Best Management Practices Design Guide for recommended plant species for LID facilities in Edmonton.</p> <p>13.2.4 See the latest edition of the City of Edmonton Low Impact Development Construction, Inspection, and Maintenance Guide for guidelines on construction, inspection, CCC, FAC, and maintenance of LID facilities.</p> |
| <p>13.1.7 No planting beds containing wood or bark mulch shall be allowed below the 1:5 flood level. Biodegradable erosion blankets shall be used, or approved alternates at the discretion of the Director/Parks.</p> | <p>13.1.11 No planting beds containing wood or bark mulch shall be allowed below the 1:5 flood level.</p> |
| <p>13.1.13 All naturalized shrub beds should use a biodegradable erosion blanket, or approved alternative where applicable.</p> | <p>CLAUSE REMOVED</p> |
| <p>13.1.16 The site must be designed to permit access of maintenance vehicles including, but not limited to, water trucks, pruning trucks and man lifts.</p> | <p>13.1.19 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 Roadways Construction Detail 5160 Shared Use Path.</p> |

| 2015 CLAUSE | APPROVED CHANGE IN 2016 STANDARDS |
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| | <p><u>UPDATES TO SPECIFICATIONS</u></p> <p>02920 Seed and Sod - Addition of 2.1.3. Native and Naturalization Seed Mixes, addition of new clause 2.2.1</p> <p>02930 Trees, Shrubs and Ground Covers - update clause 2.1.6, update clause 2.3.1, update to clause: 3.5.1, new clause 3.5.2, new clause 3.5.3, update to clause 3.6.5, update to clause 3.9.11, update to clause 3.10.1, update to clause 3.14.7</p> <p>02931 Naturalization - update to clause 1.5.4, new clause 1.5.5</p> |
| | <p><u>UPDATES TO DETAILS</u></p> <p>LA 102, 103, 104, 105, 107, 108, 108A, 109, 110, 111 - Mulch now references Specification 02914 Mulches)</p> <p>Detail LA 102, 103, 107 - Root ball min. size as per "CNLA Standards for Nursery Stock"</p> <p>LA100- Large Tree "Tree Protection Zone"</p> <p>LA101-Small Tree "Tree Protection Zone" (maximum 80 mm caliper)</p> <p>LA405 – Fencing and concrete post now require to be wholly within private property.</p> |

Appendix G
“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 H
“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.

| Approved Tree Species – Spacing and Spread | | | | | | | | |
|--|----------------------------|---------|------|----|---|----|----|----|
| Deciduous Trees | | | Code | | | | | |
| Botanical Name | Common Name | Spacing | S | St | P | Pt | Ec | La |
| <i>Alnus crispa</i> | Green Alder | 4 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 | | Ec | |
| <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 |

| Deciduous Trees | | | Code | | | | | |
|--|------------------------------|---------|------|----|---|----|----|----|
| Botanical Name | Common Name | Spacing | S | St | P | Pt | Ec | 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 platyphylla</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 | | | |
| <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 | | | 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 | | | |

| Deciduous Trees | | | Code | | | | | |
|---|----------------------------------|---------|------|----|---|----|----|----|
| Botanical Name | Common Name | Spacing | S | St | P | Pt | Ec | La |
| <i>Malus x prunifolia</i> var 'Rinki Crabapple' | Rinki Crabapple | 5 m | S | | P | | | |
| <i>Malus x 'Jefgreen'</i> | Emerald Spire Crabapple | 2 m | S | | P | | | |
| <i>Malus x 'Jefspire'</i> | Purple Spire Crabapple | 2 m | S | | P | | | |
| <i>Phellodendron amurense</i> | Amur Cork Tree | 10 m | | | P | | | |
| <i>Populus x 'Assiniboine'</i> | Assiniboine Poplar | 8 m | | | P | | | |
| <i>Populus x 'ACWS151'</i> | Sundancer Poplar | 4 m | | | P | | | |
| <i>Populus x 'Tristis'</i> | Tristis Poplar | 10 m | | | P | | | |
| <i>Populus x 'Okanese'</i> | 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 | S | | 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 | | | | | |
| <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 x DurPSN303</i> ' | 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 x 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 | | | |

| Deciduous Trees | | | Code | | | | | |
|--------------------------------------|------------------------------|---------|------|----|---|----|----|----|
| Botanical Name | Common Name | Spacing | S | St | P | Pt | Ec | La |
| <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 x 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 | | | |

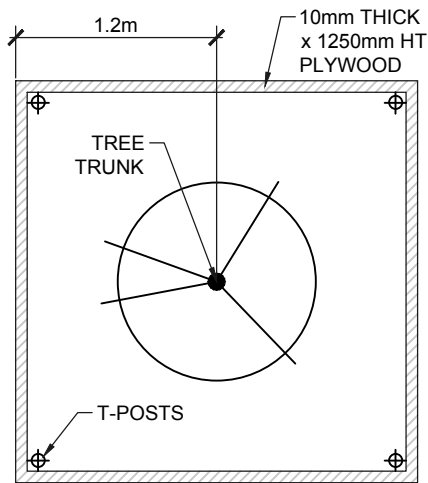
| Coniferous Trees | | | Code | | | | | |
|--|------------------------------|---------|------|----|---|----|----|----|
| Botanical Name | Common Name | Spacing | S | St | P | Pt | Ec | La |
| <i>Abies balsamea</i> | Balsam Fir | 4 m | | | | Pt | | La |
| <i>Abies concolor</i> | White Fir | 4 m | | | | 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 |

| Coniferous Trees | | | Code | | | | | |
|-------------------------------|--------------------------------|---------|------|----|---|----|----|----|
| Botanical Name | Common Name | Spacing | S | St | P | Pt | Ec | La |
| <i>Pinus sylvestris</i> | Scots Pine | 8 m | | | P | | | |
| <i>Pseudotsuga menziesii</i> | Douglas Fir | 8 m | | | P | | | |
| <i>Thuja</i> 'Brandon' | Brandon Pyrimidal Cedar | 4 m | | | P | | | |
| <i>Thuja</i> 'Skybound' | Skybound Pyrimidal Cedar | 4 m | | | P | | | |
| <i>Thuja</i> 'Degroots Spire' | Degroots Spire Pyrimidal Cedar | 4 m | | | P | | | |

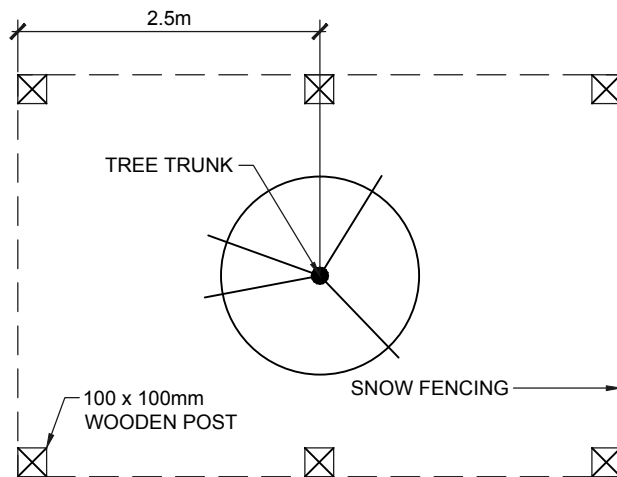
Landscape Construction Detail Reference

| Drawing No. | Drawing Title | Issue Date |
|--------------------|--|-------------------|
| LA100 | Large Tree “Tree Protection Zone” | June 2016 |
| LA101 | Small Tree “Tree Protection Zone” (Max. 80 mm Cal.) | June 2016 |
| LA102 | Typical Tree Installation | June 2016 |
| LA103 | Typical Multi-Stem Installation | June 2016 |
| LA104 | Typical Tree Transplanted | June 2016 |
| LA105 | Typical Multi-Stem Transplanted | June 2016 |
| LA106 | Typical Tree Grate Planting | June 2015 |
| LA107 | Typical Tree Planting on Slope | June 2016 |
| LA108 | Typical Tree Planting Bed | June 2016 |
| LA108A | Typical Tree and Shrub Planting Bed | June 2016 |
| LA109 | Typical Planting Bed on a Slope | June 2016 |
| LA110 | Typical Shrub Naturalization | June 2016 |
| LA111 | Typical Tree Naturalization | June 2016 |
| LA112 | Typical Tree Rodent Protection | June 2016 |
| LA113 | Typical Tree Root Trench | June 2015 |
| LA200 | Subdrainage Pipe Installation | September 2013 |
| LA201 | Typical Subdrainage Pipe Connections | September 2013 |
| LA202 | Playground Drainage Sump | September 2013 |
| 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 | September 2013 |
| LA301 | Asphalt Walkway or Plaza | June 2015 |
| LA302 | Concrete Walkway or Plaza | September 2013 |
| LA303 | Granular Walkway | September 2013 |
| 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 2016 |
| 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 |



DETAIL A - TREES WITHIN 1 - 3m OF ACTIVE CONSTRUCTION




DETAIL B - TREES WITHIN 3 - 5m OF ACTIVE CONSTRUCTION

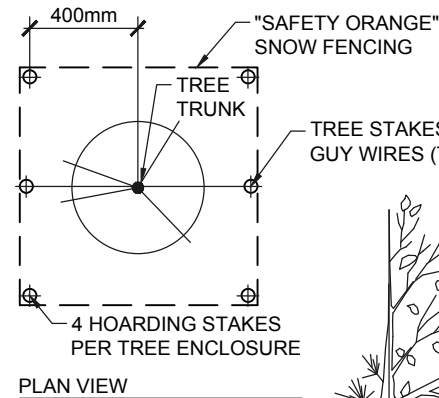
NOTES:

- SPECIFICATIONS: ALL COMPONENTS AND WORKMANSHIP SHALL CONFORM TO SPECIFICATION SECTION 02930 TREES, SHRUBS AND GROUNDCOVERS AS WELL AS THE RELATED SECTIONS.
- DETAIL A - TREES WITHIN 1 - 3m OF CONSTRUCTION ACTIVITY REQUIRE:
 - 10mm PLYWOOD AND 1.25m HEIGHT ENCLOSURE SEPARATING TREE FROM THE PROJECT SITE.
 - PLYWOOD TO BE SECURELY FASTENED TO T-POSTS WITH WIRE.
- DETAIL B - TREES WITHIN 3 - 5m OF CONSTRUCTION ACTIVITY REQUIRE:
 - A STANDARD "SAFETY ORANGE" SNOW FENCE TO BE PLACED A MIN. OF 2.5m FROM THE TREE TRUNK.
 - EXACT SIZE AND SHAPE TO BE DETERMINED ON SITE.
- EXCAVATION WITHIN 2m OF EXISTING TREES REQUIRES:
 - TREE TO BE TRANSPLANTED IF FEASIBLE.
 - IF TRANSPLANTING TREE IS NOT FEASIBLE, TREE IS TO BE REMOVED AND THE VALUE OF THE TREE ASSESSED BY FORESTRY.
 - THE DEVELOPER/CONTRACTOR IS RESPONSIBLE FOR THE ASSESSED VALUE.
- EXCAVATION BEYOND 2m OF EXISTING TREES REQUIRES:
 - PRIOR TO DIGGING, ALL TREE ROOTS TO BE SEVERED WITH A "ROOT-CUTTER" TO A DEPTH OF 350mm TO 500mm.
 - IMMEDIATELY AFTER EXCAVATION, PRUNE ALL EXPOSED ROOTS FLUSH WITH THE EXCAVATION WALL.
- INSTALL AND MAINTAIN TREE PROTECTION THROUGHOUT THE CONSTRUCTION PROCESS IN A CLEAN AND SAFE CONDITION.
- TREE PROTECTION REQUIREMENTS ARE AS SHOWN ON LANDSCAPE DRAWINGS AND AS DIRECTED BY THE CITY OF EDMONTON ON SITE.
- ALL EQUIPMENT, SOIL, BUILDING MATERIALS & OTHER DEBRIS SHALL BE KEPT OUTSIDE THE HOARDING.
- IN THE EVENT THE TREE PROTECTION IS PUNCTURED AND DAMAGE OCCURS TO THE TREE(S) WITHIN THE TREE PROTECTION, THE PROJECT MANAGER IS TO BE ADVISED IMMEDIATELY IN ORDER THAT THE DAMAGE BE ASSESSED BY FORESTRY & CORRECTIVE ACTION TAKEN.
- ON MANY CONSTRUCTION PROJECTS STANDARD "SAFETY ORANGE" SNOW FENCING IS ALL THAT MAY BE REQUIRED. THIS WILL SERVE AS A "HEADS-UP" WARNING TO WORKERS OR EQUIPMENT OPERATORS THAT ANY ACTIVITY BEYOND THE FENCE MAY CAUSE TREE DAMAGE.



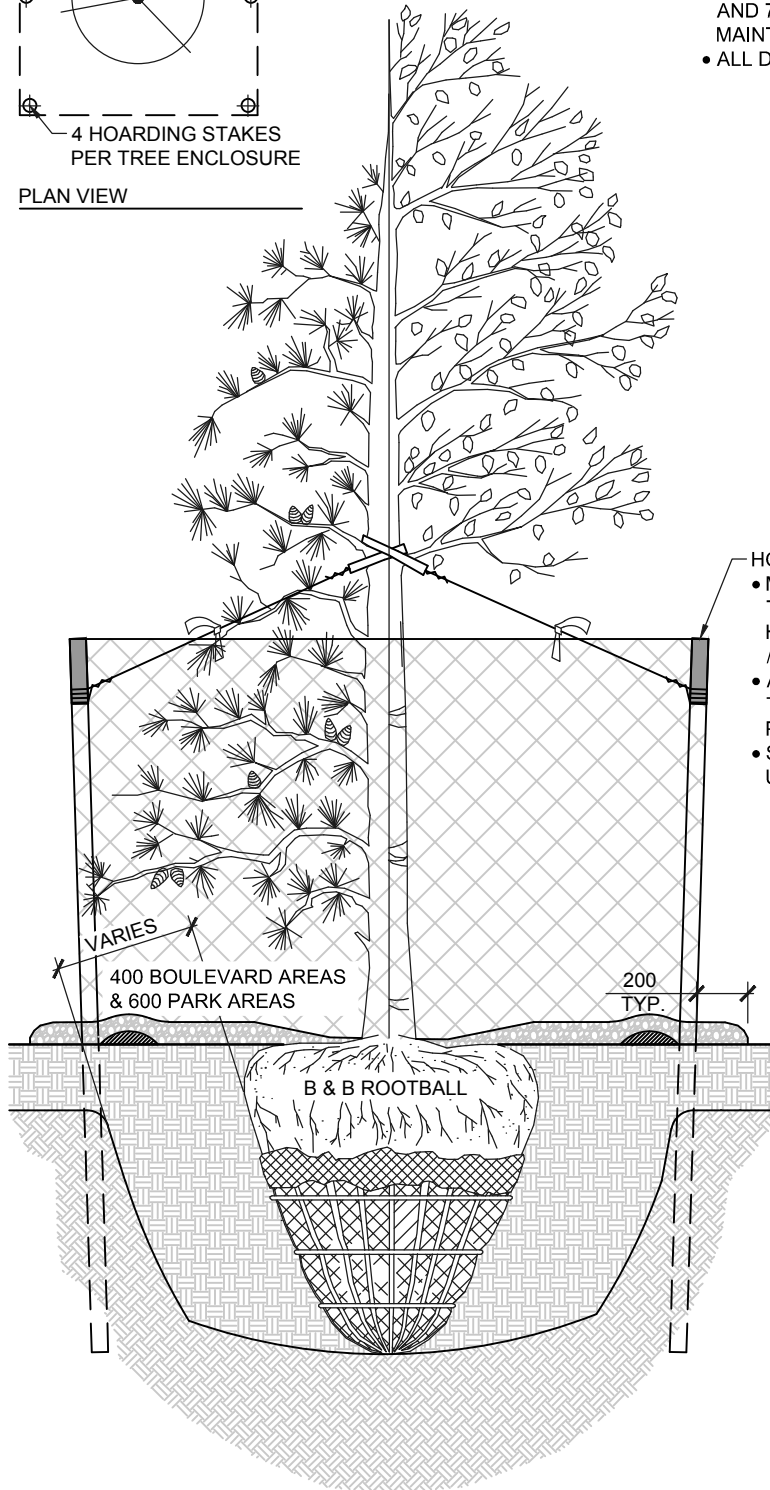
LARGE TREE "TREE PROTECTION ZONE"

| | | | | |
|-----------------------------|----------------------------------|--|----------|--------------------------|
| Date Approved: JUNE 2016 | Drawn By: PARKS PLANNING | Approved:  | Revision | Drawing No. LA100 |
| Scale: N.T.S. | Checked By: PARKS PLANNING | | | Old Drawing No. SP403 |



NOTES:

- 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.




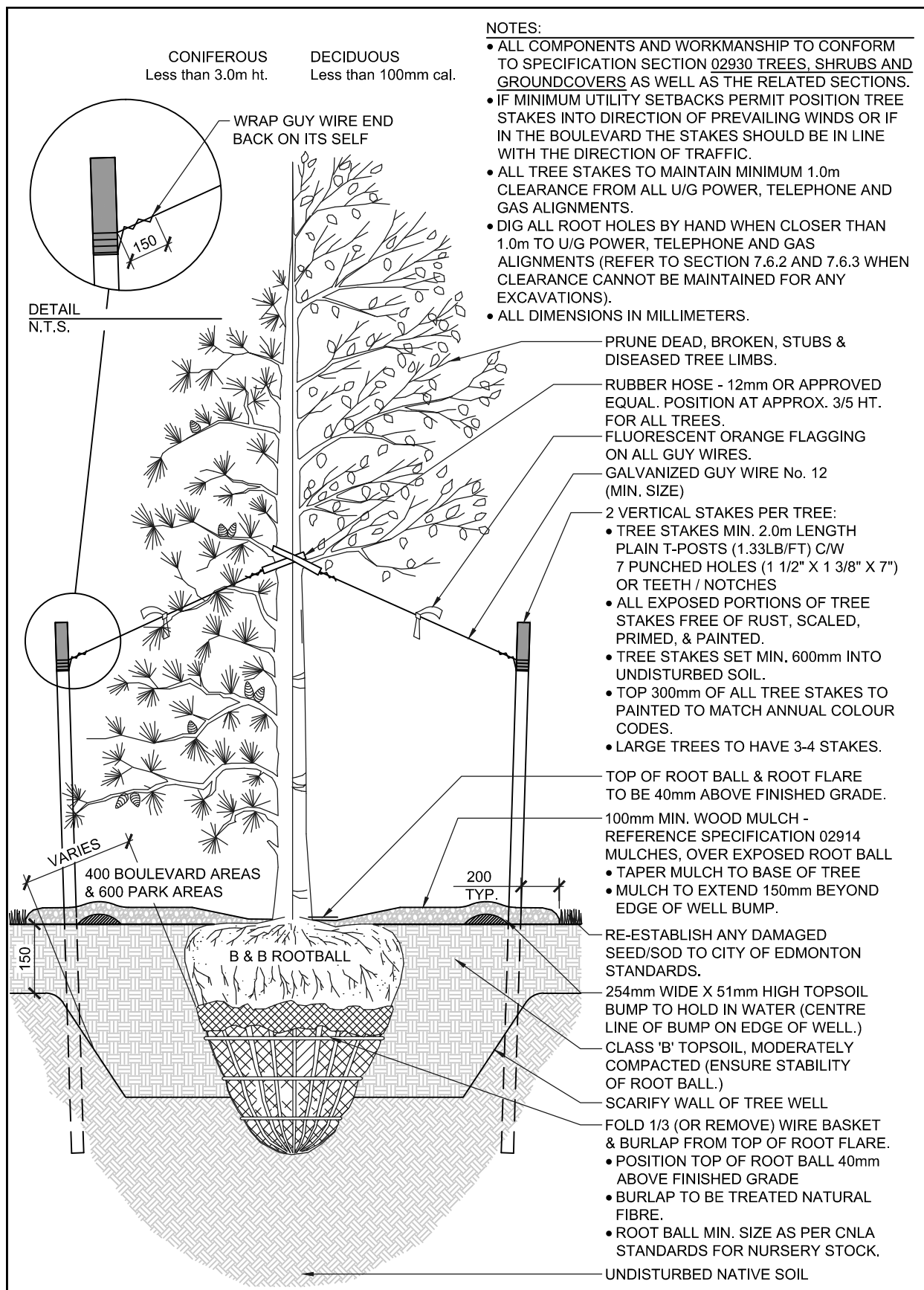
HOARDING STAKES:

- MIN. 2.0m LENGTH VERTICAL PLAIN T-POSTS (1.33LM/FT) C/W 7 PUNCHED HOLES (1 1/2" X 1 3/8" X 7") OR TEETH / NOTCHES
- ALL EXPOSED PORTIONS OF STAKES TO BE FREE OF RUST, SCALED, PRIMED, & PAINTED.
- STAKES SET MIN. 600mm INTO UNDISTURBED SOIL.



SMALL TREE "TREE PROTECTION ZONE" (MAX. 80mm CAL.)

| | | | | |
|-----------------------------|----------------------------------|--|----------|---------------------------|
| Date Approved: JUNE 2016 | Drawn By: PARKS PLANNING | Approved:  | Revision | Drawing No. LA101 |
| Scale: N.T.S. | Checked By: PARKS PLANNING | | | Old Drawing No. SP403a |



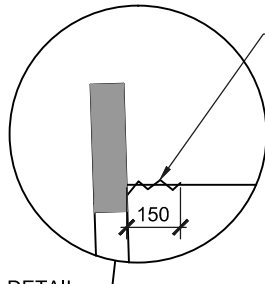
NOTES:

- 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 TREE INSTALLATION

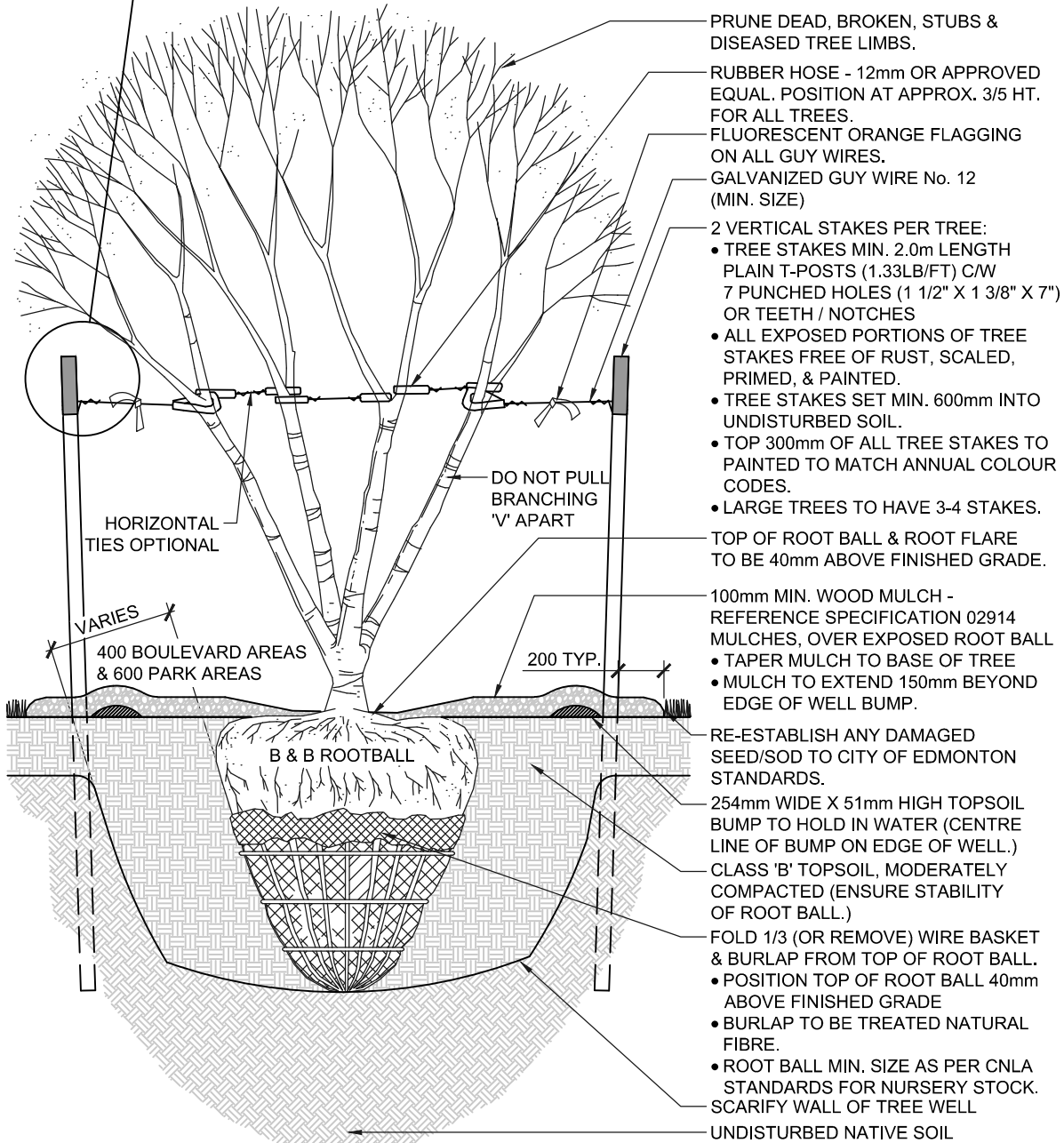
| | | | | |
|-----------------------------|----------------------------------|--|----------|---------------------------|
| Date Approved: JUNE 2016 | Drawn By: PARKS PLANNING | Approved: <i>M.C. [Signature]</i> | Revision | Drawing No. LA102 |
| Scale: N.T.S. | Checked By: PARKS PLANNING | | | Old Drawing No. SP400a |




DETAIL
N.T.S.

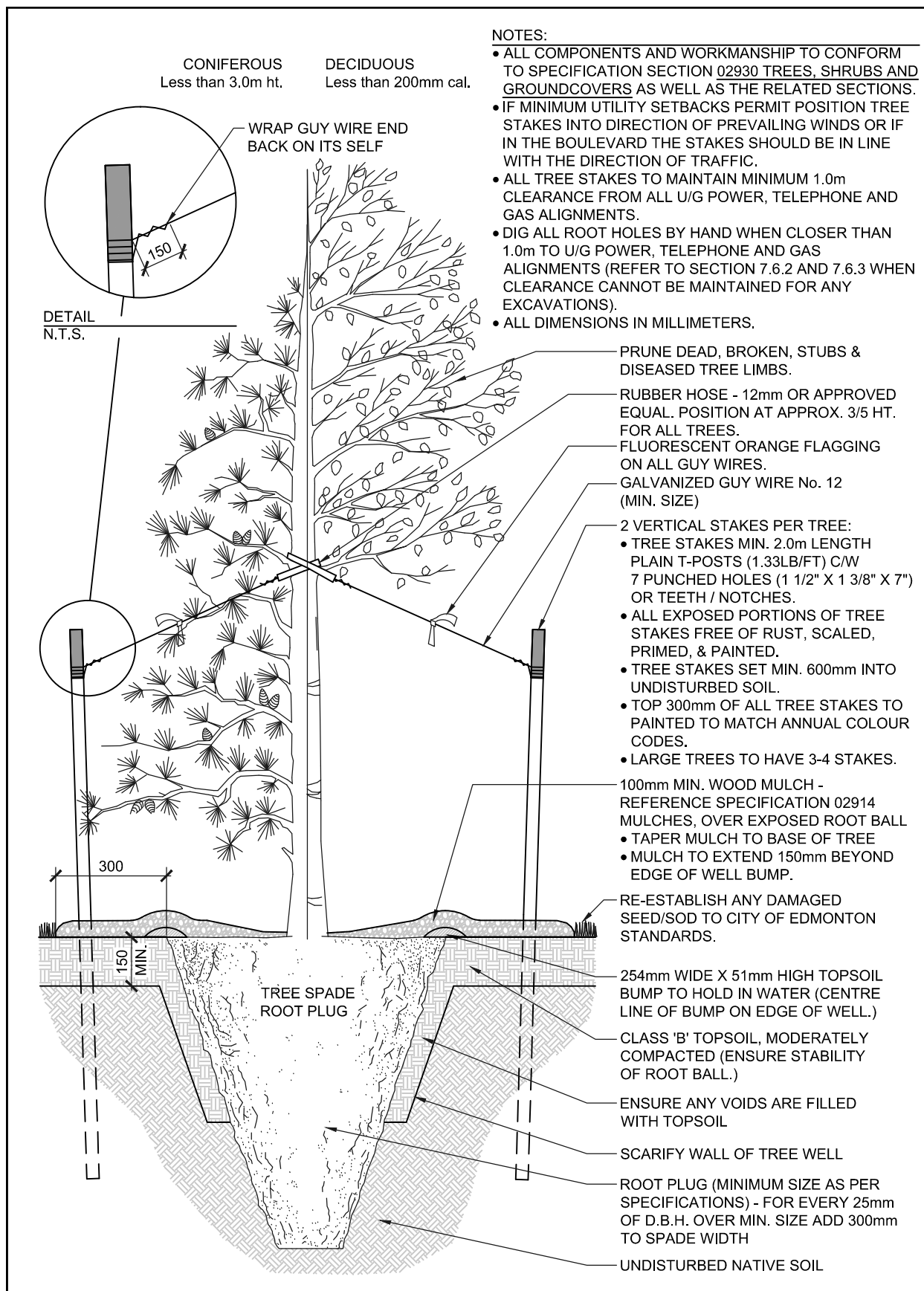
NOTES:

- 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: JUNE 2016 | Drawn By: PARKS PLANNING | Approved:  | Revision | Drawing No. LA103 |
| Scale: N.T.S. | Checked By: PARKS PLANNING | | | Old Drawing No. SP400c |




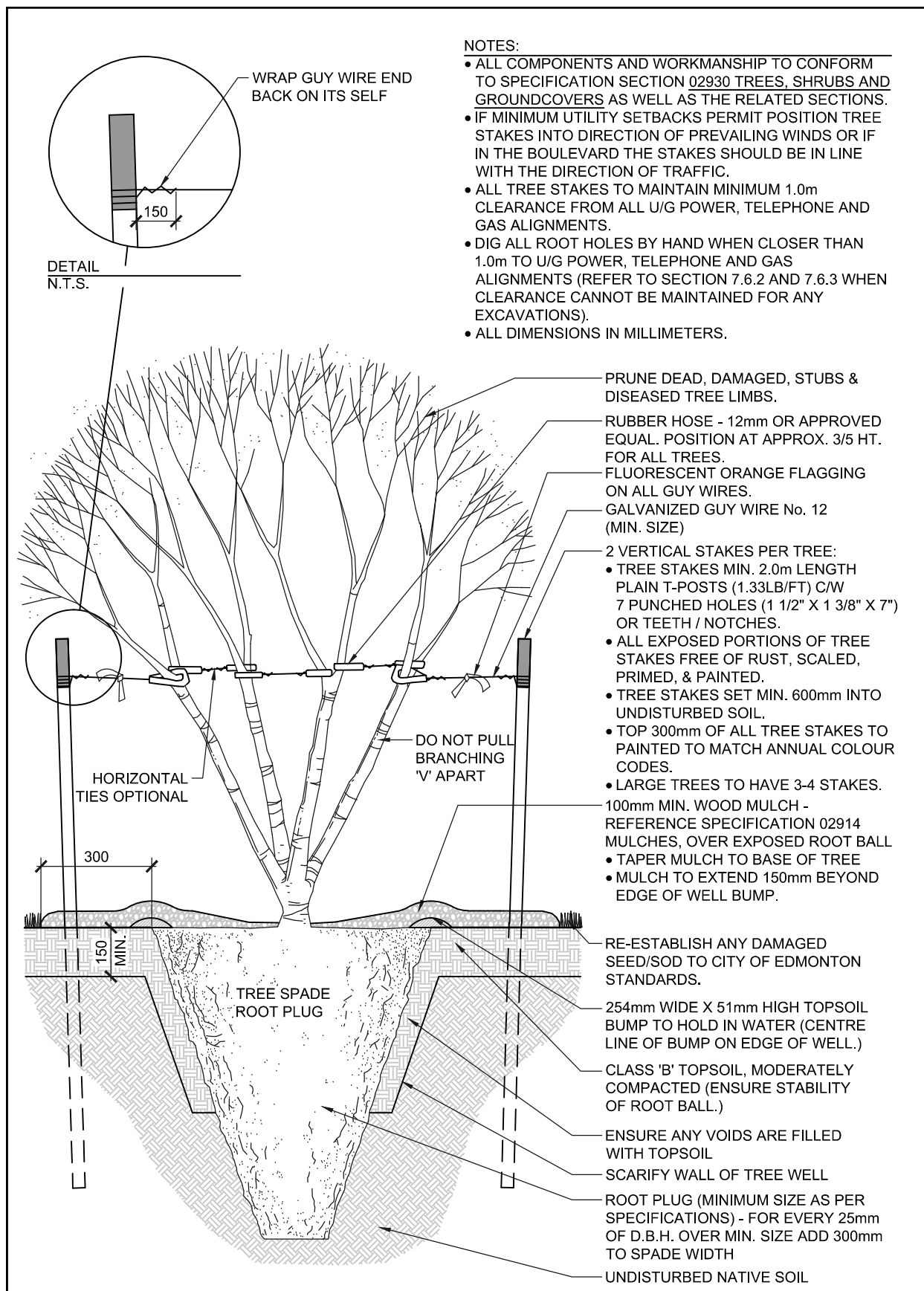
NOTES:

- 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 TREE TRANSPLANTED

| | | | | |
|-----------------------------|----------------------------------|--|----------|---------------------------|
| Date Approved: JUNE 2016 | Drawn By: PARKS PLANNING | Approved:  | Revision | Drawing No. LA104 |
| Scale: N.T.S. | Checked By: PARKS PLANNING | | | Old Drawing No. SP400d |



TYPICAL MULTI-STEM TRANSPLANTED

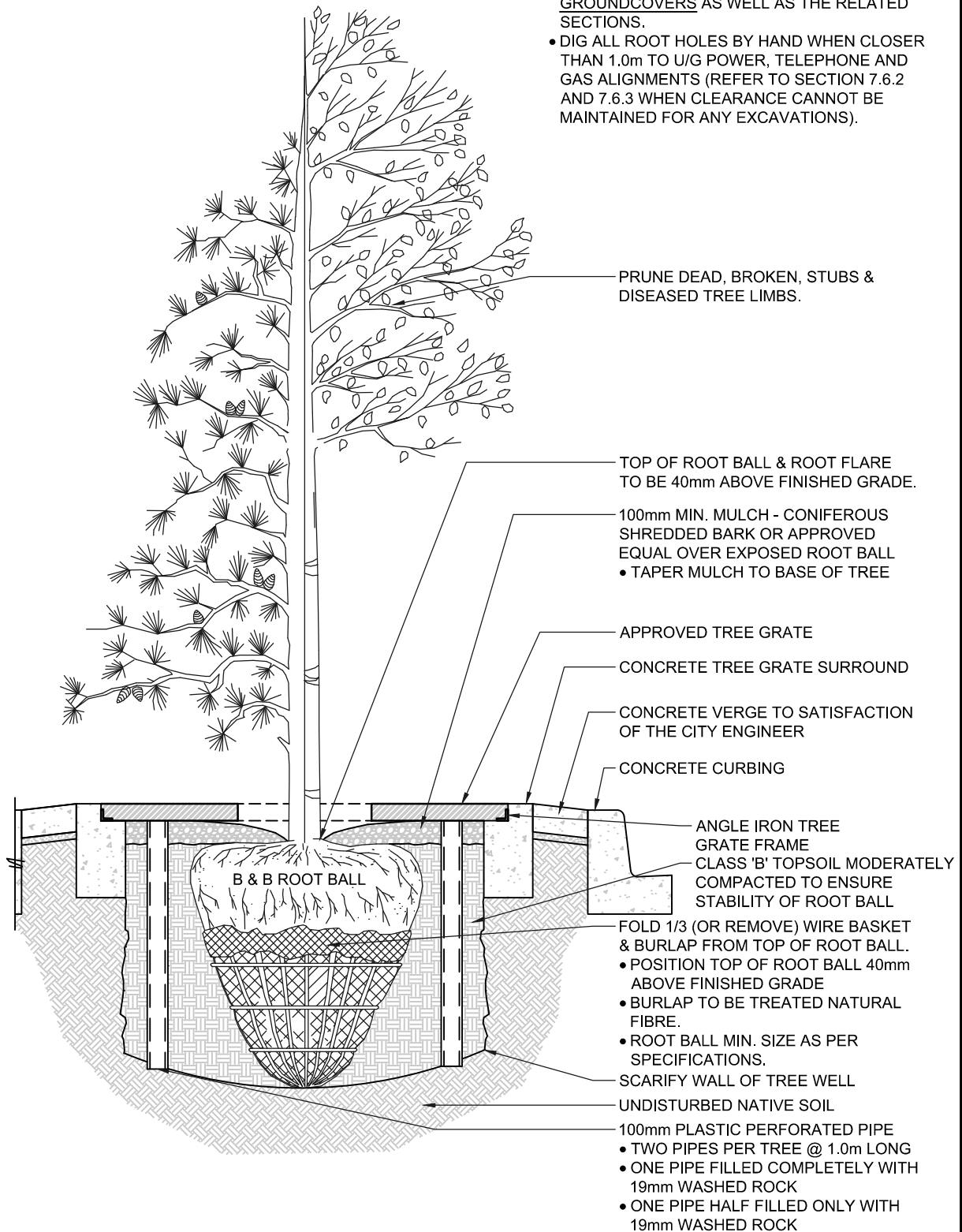
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|-----------------------------|----------------------------------|--|----------|---------------------------|
| Date Approved: JUNE 2016 | Drawn By: PARKS PLANNING | Approved:  | Revision | Drawing No. LA105 |
| Scale: N.T.S. | Checked By: PARKS PLANNING | | | 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:
JUNE 2015

Drawn By:
PARKS
PLANNING
Checked By:
PARKS
PLANNING

Approved:

Frank Gasparik

Revision

Drawing No.

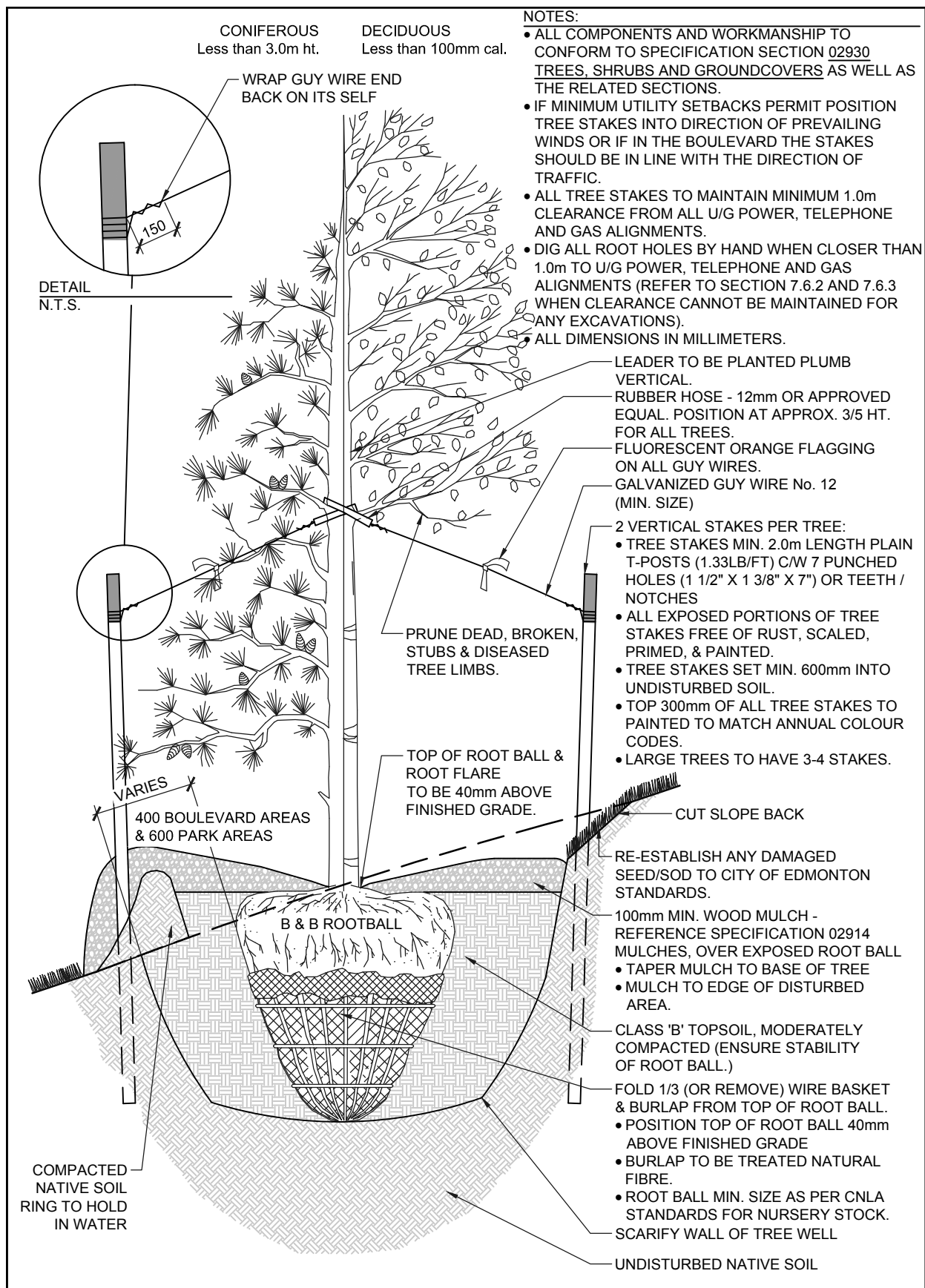
LA106

Scale:

N.T.S.

Old Drawing No.

SP400h



TYPICAL TREE PLANTING ON SLOPE

Date Approved:
JUNE 2016

Drawn By:
PARKS
PLANNING

Approved:

M.C. Jones

Revision

Drawing No.

LA107

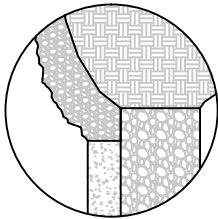
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Checked By:
PARKS
PLANNING

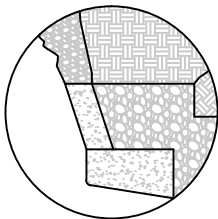
Old Drawing No.

SP400i

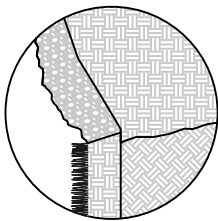
N.T.S.



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

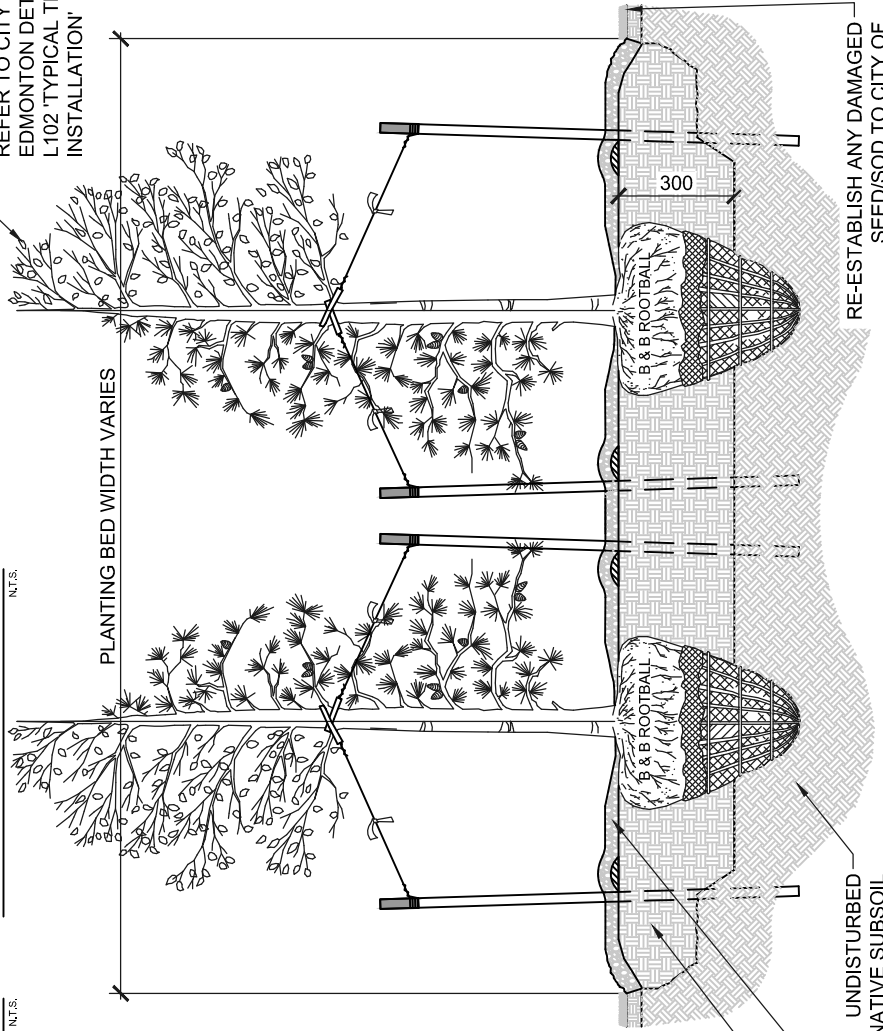
NOTES:

- 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 ANY EXCAVATIONS).
- ALL DIMENSIONS IN MILLIMETERS.

- 300mm MIN. DEPTH CLASS 'B' 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.

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


PLANTING BED WIDTH VARIES

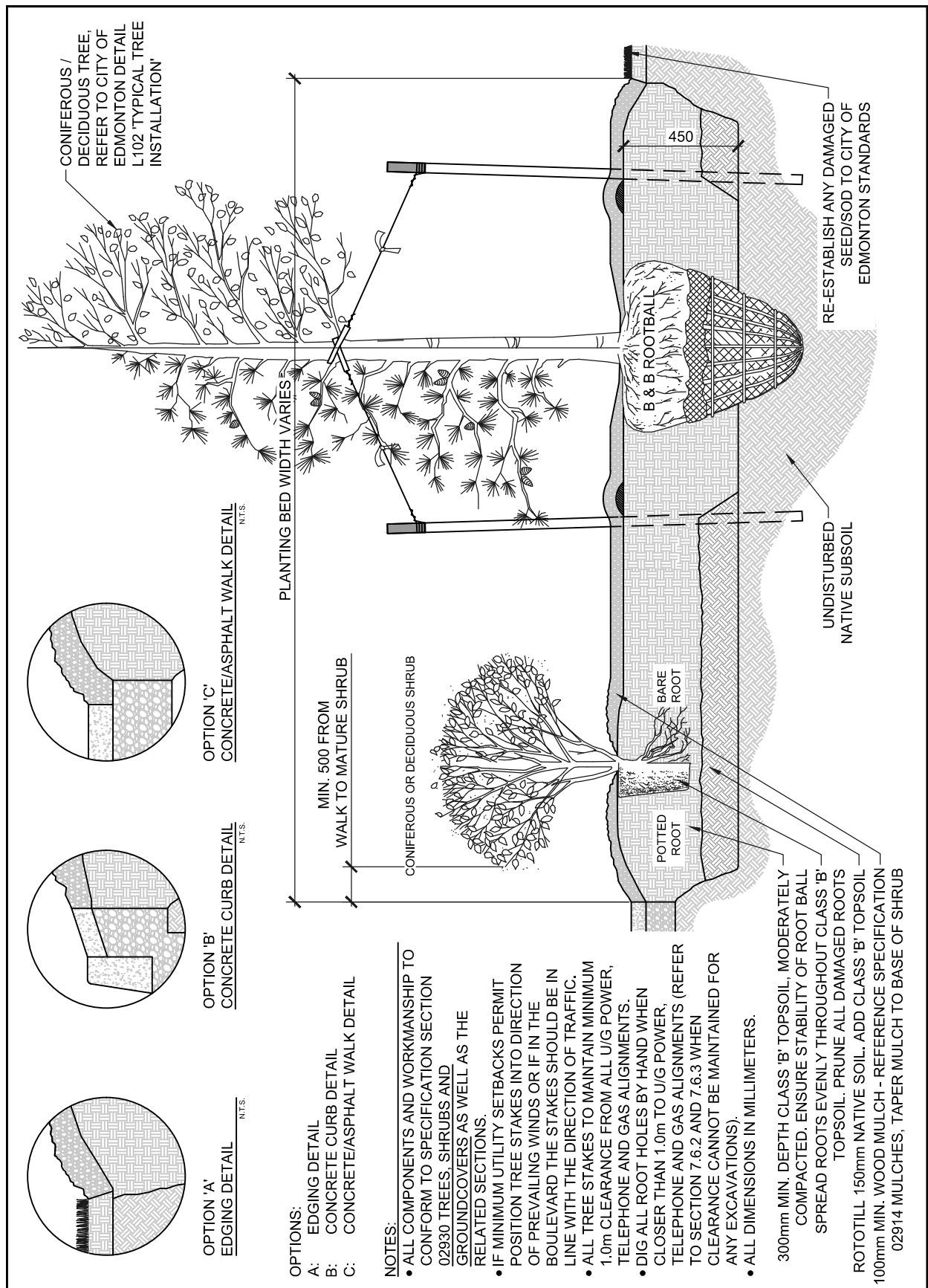


RE-ESTABLISH ANY DAMAGED
SEED/SOD TO CITY OF
EDMONTON STANDARDS




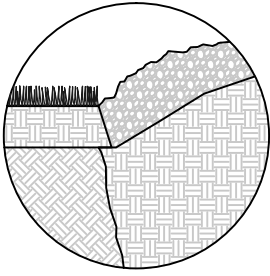
TYPICAL TREE PLANTING BED

| | | | | |
|-----------------------------|----------------------------------|--|----------|----------------------|
| Date Approved: JUNE 2016 | Drawn By: PARKS PLANNING | Approved:  | Revision | Drawing No. LA108 |
| Scale: N.T.S. | Checked By: PARKS PLANNING | | | Old Drawing No. - |



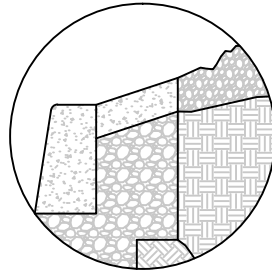
TYPICAL TREE AND SHRUB PLANTING BED

| | | | | |
|-----------------------------|----------------------------------|--|----------|--------------------------|
| Date Approved: JUNE 2016 | Drawn By: PARKS PLANNING | Approved:  | Revision | Drawing No. LA108A |
| Scale: N.T.S. | Checked By: PARKS PLANNING | | | Old Drawing No. LA108 |



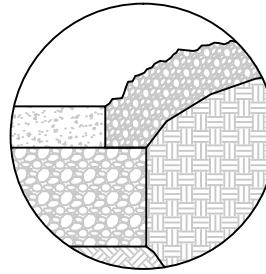
OPTION 'A'
EDGING DETAIL

N.T.S.



OPTION 'B'
CONCRETE CURB DETAIL

N.T.S.

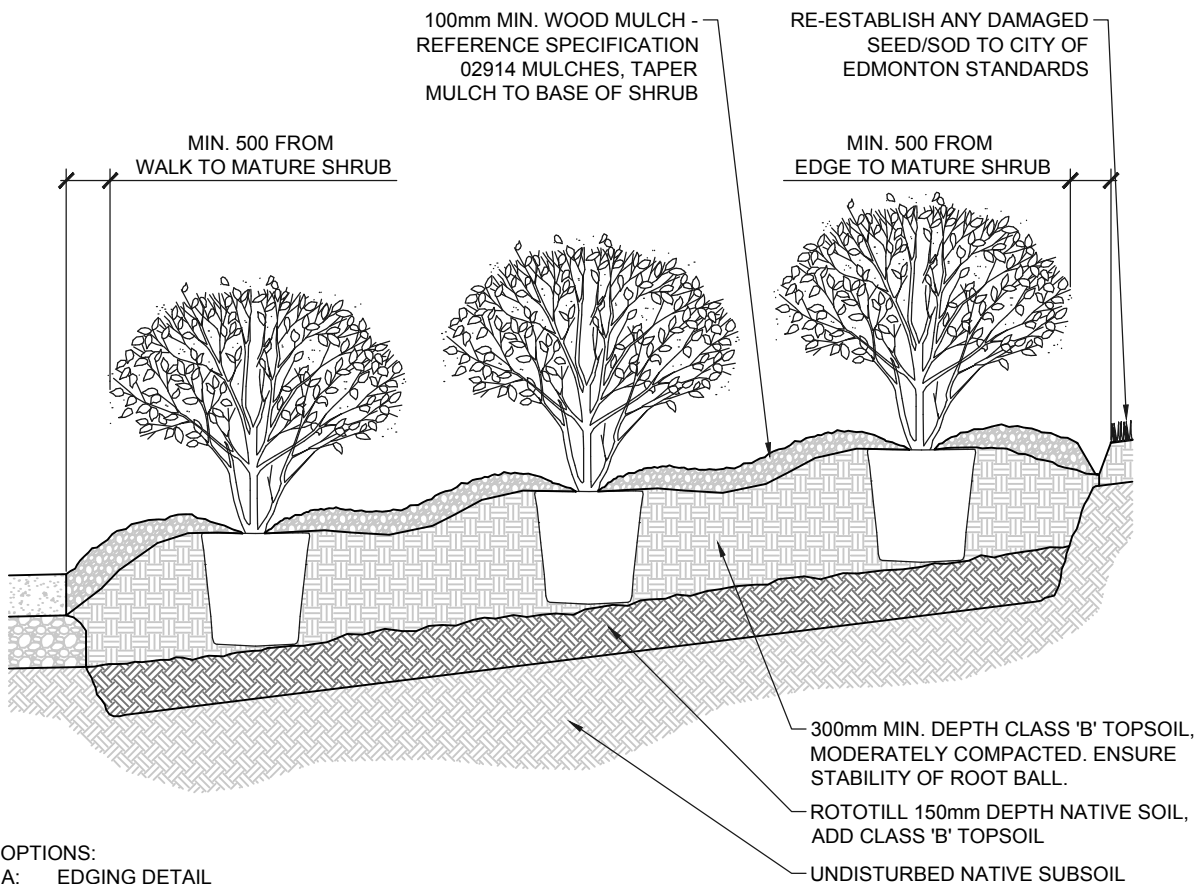


OPTION 'C'
CONCRETE/ASPHALT WALK DETAIL

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 (REFER TO SECTION 7.6.2 AND 7.6.3 WHEN CLEARANCE CANNOT BE MAINTAINED FOR ANY EXCAVATIONS).
- ALL DIMENSIONS IN MILLIMETERS.




OPTIONS:

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

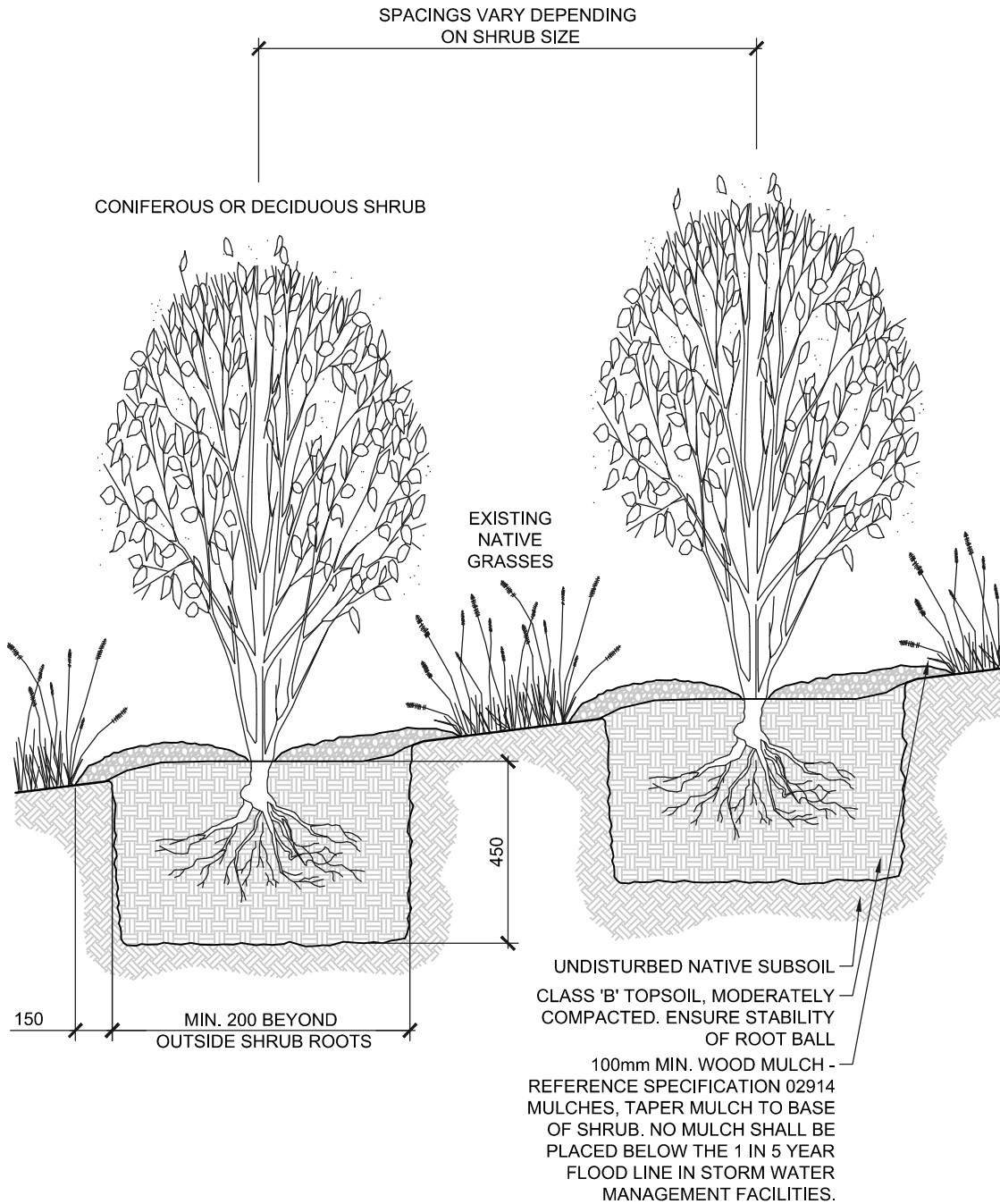


TYPICAL PLANTING BED ON A SLOPE


| | | | | |
|-----------------------------|----------------------------------|--|----------|---------------------------|
| Date Approved: JUNE 2016 | Drawn By: PARKS PLANNING | Approved:  | Revision | Drawing No. LA109 |
| Scale: N.T.S. | Checked By: PARKS PLANNING | | | 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.

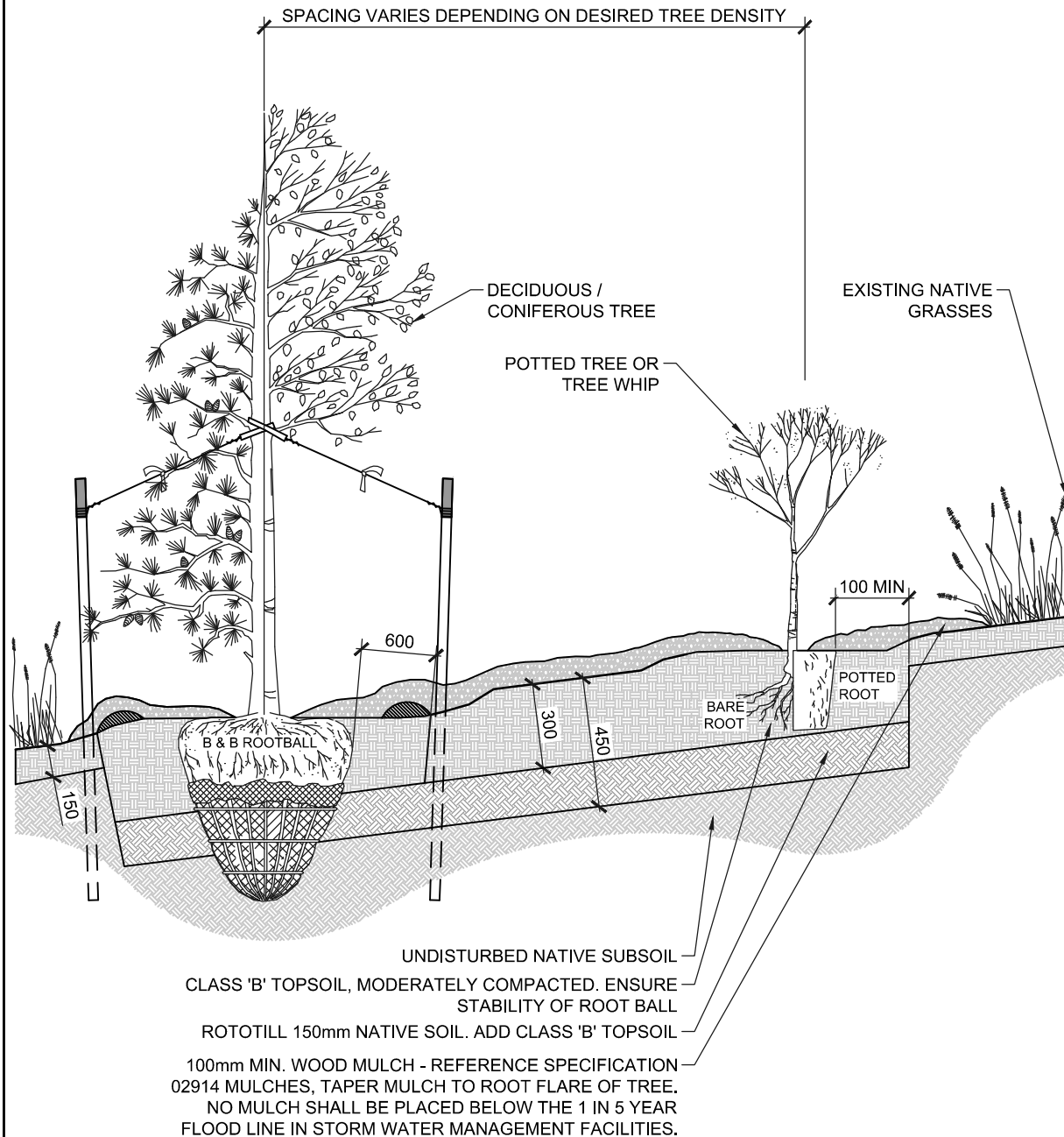


TYPICAL SHRUB NATURALIZATION


| | | | | |
|-----------------------------|----------------------------------|--|----------|---------------------------|
| Date Approved: JUNE 2016 | Drawn By: PARKS PLANNING | Approved:  | Revision | Drawing No. LA110 |
| Scale: N.T.S. | Checked By: PARKS PLANNING | | | Old Drawing No. SP401c |

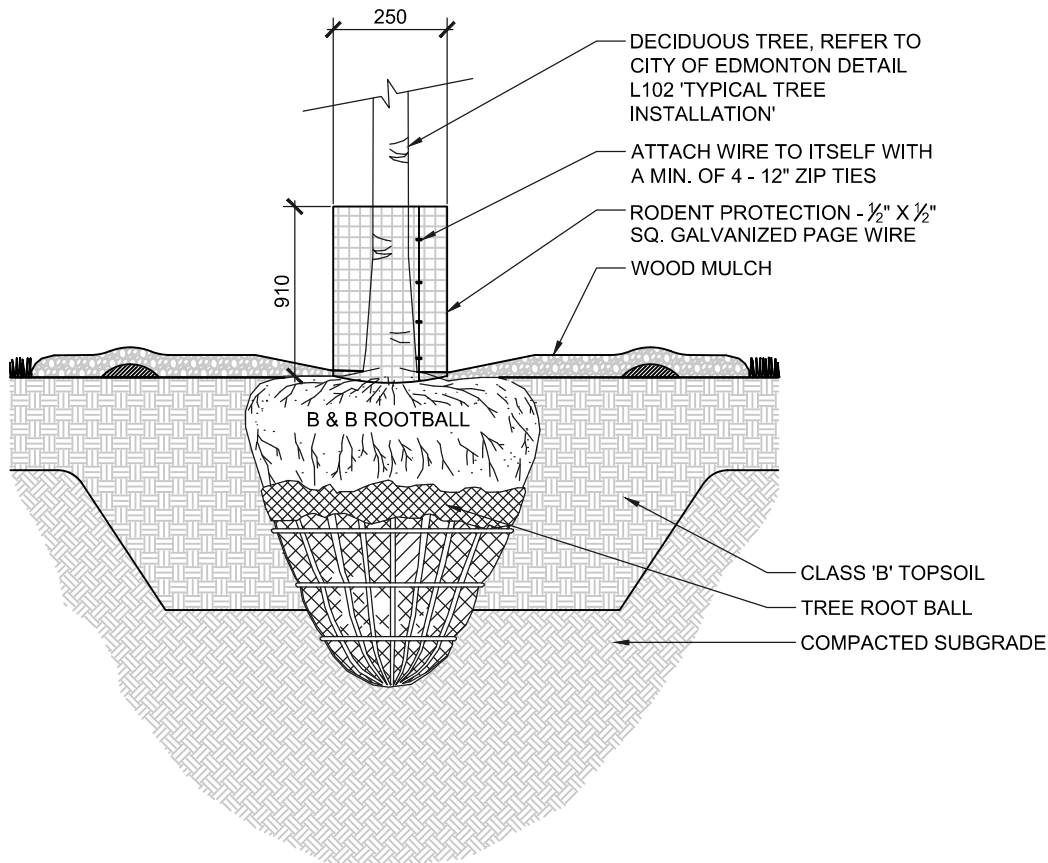
NOTES:

- 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.



TYPICAL TREE NATURALIZATION

| | | | | |
|-----------------------------|----------------------------------|--|----------|------------------------|
| Date Approved: JUNE 2016 | Drawn By: PARKS PLANNING | Approved:  | Revision | Drawing No. LA111 |
| Scale: N.T.S. | Checked By: PARKS PLANNING | | | Old Drawing No. N/A |



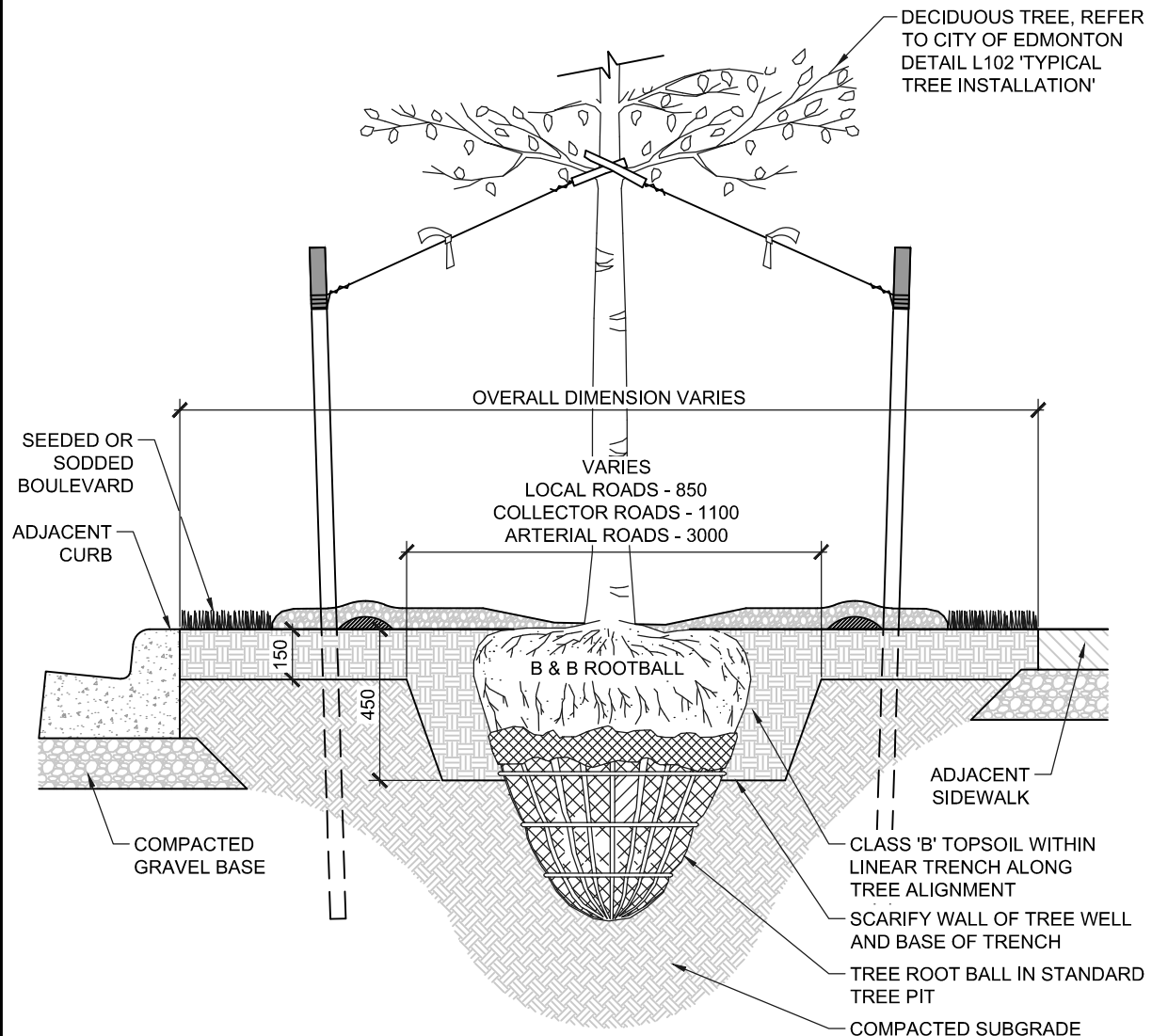
NOTES:

- 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: JUNE 2015 | Drawn By: PARKS PLANNING | Approved: <i>Frank Gasparik</i> | Revision | Drawing No. LA112 |
| Scale: N.T.S. | Checked By: PARKS PLANNING | | | Old Drawing No. N/A |



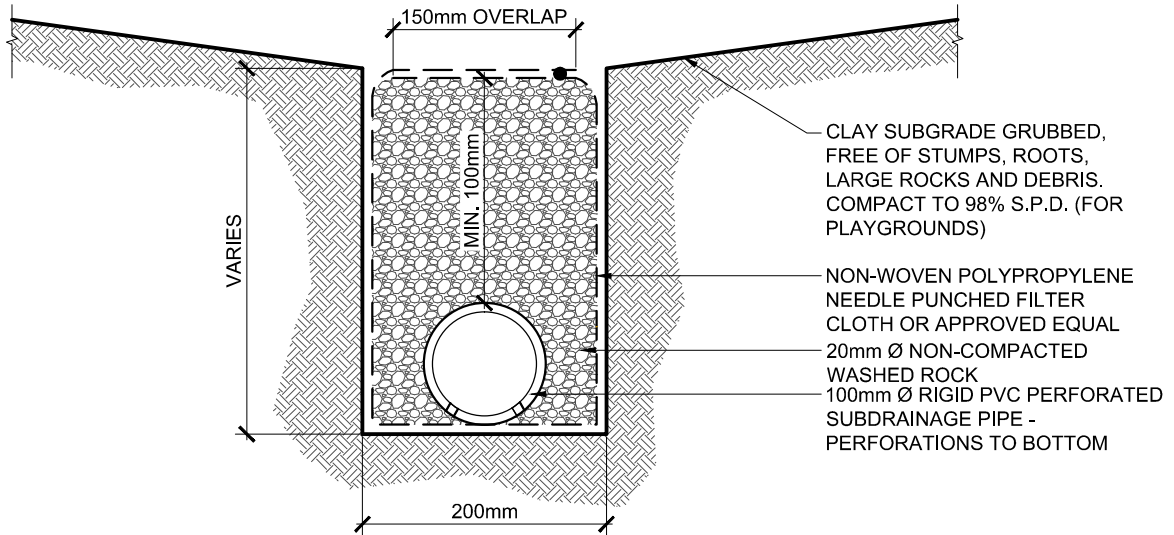
NOTES:

- 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, 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.

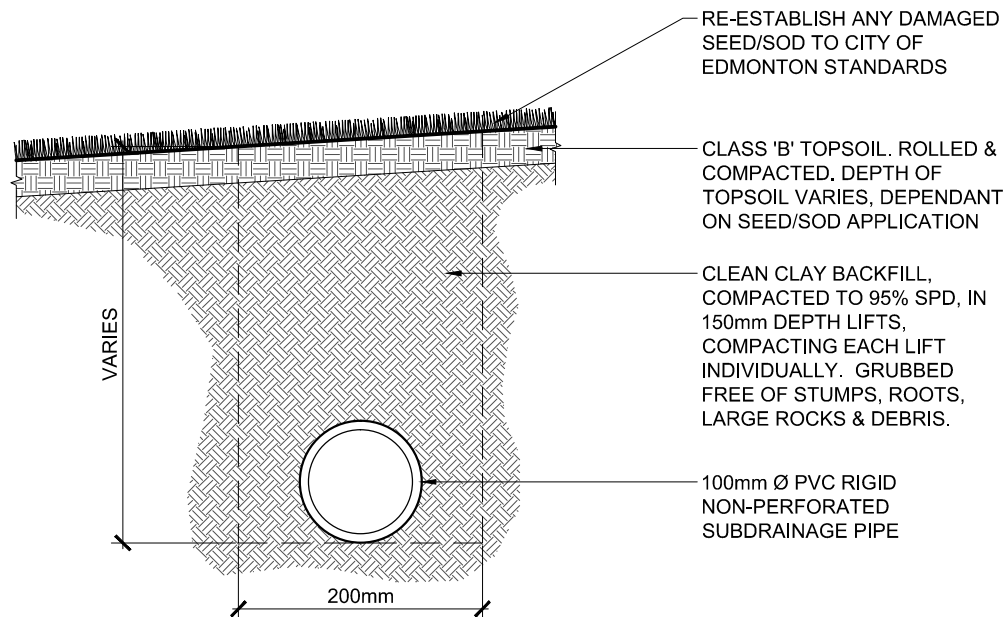


TYPICAL TREE ROOT TRENCH

| | | | | |
|-----------------------------|----------------------------------|--|----------|------------------------|
| Date Approved: JUNE 2015 | Drawn By: PARKS PLANNING | Approved: <i>Frank Gasparik</i> | Revision | Drawing No. LA113 |
| Scale: N.T.S. | Checked By: PARKS PLANNING | | | Old Drawing No. N/A |



PERFORATED SUBDRAINAGE PIPE



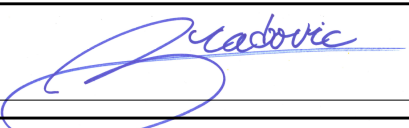
NON-PERFORATED SUBDRAINAGE PIPE

NOTES:

- MINIMUM 1.0% SLOPE ON ALL SUBDRAINAGE PIPE
- ALL DIMENSIONS IN MILLIMETERS UNLESS NOTED OTHERWISE

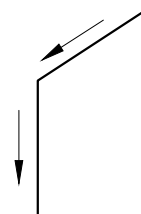
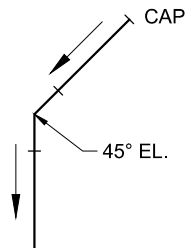
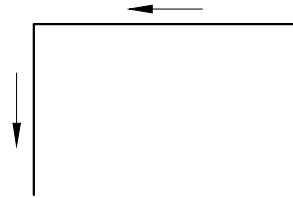
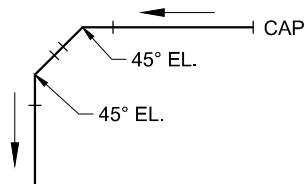
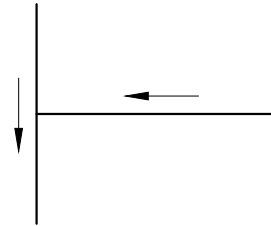
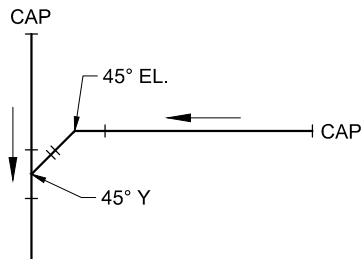
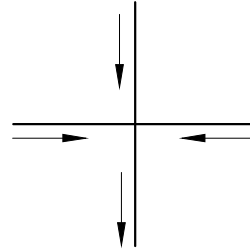
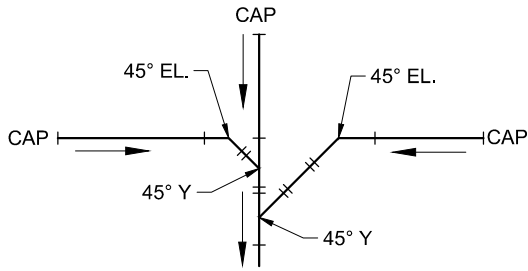


SUBDRAINAGE PIPE INSTALLATION

| | | | | |
|-----------------------------|----------------------------------|---|----------|---------------------------|
| Date Approved: SEPT 2013 | Drawn By: PARKS PLANNING | Approved:  | Revision | Drawing No. LA200 |
| Scale: N.T.S. | Checked By: PARKS PLANNING | | | Old Drawing No. SP105a |

ACTUAL CONNECTIONS

AS SHOWN ON DRAWINGS



LEGEND:

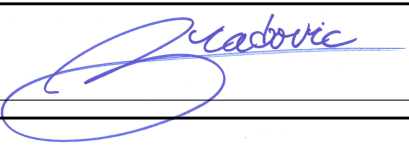
EL. ELBOW
 ← FLOW DIRECTION

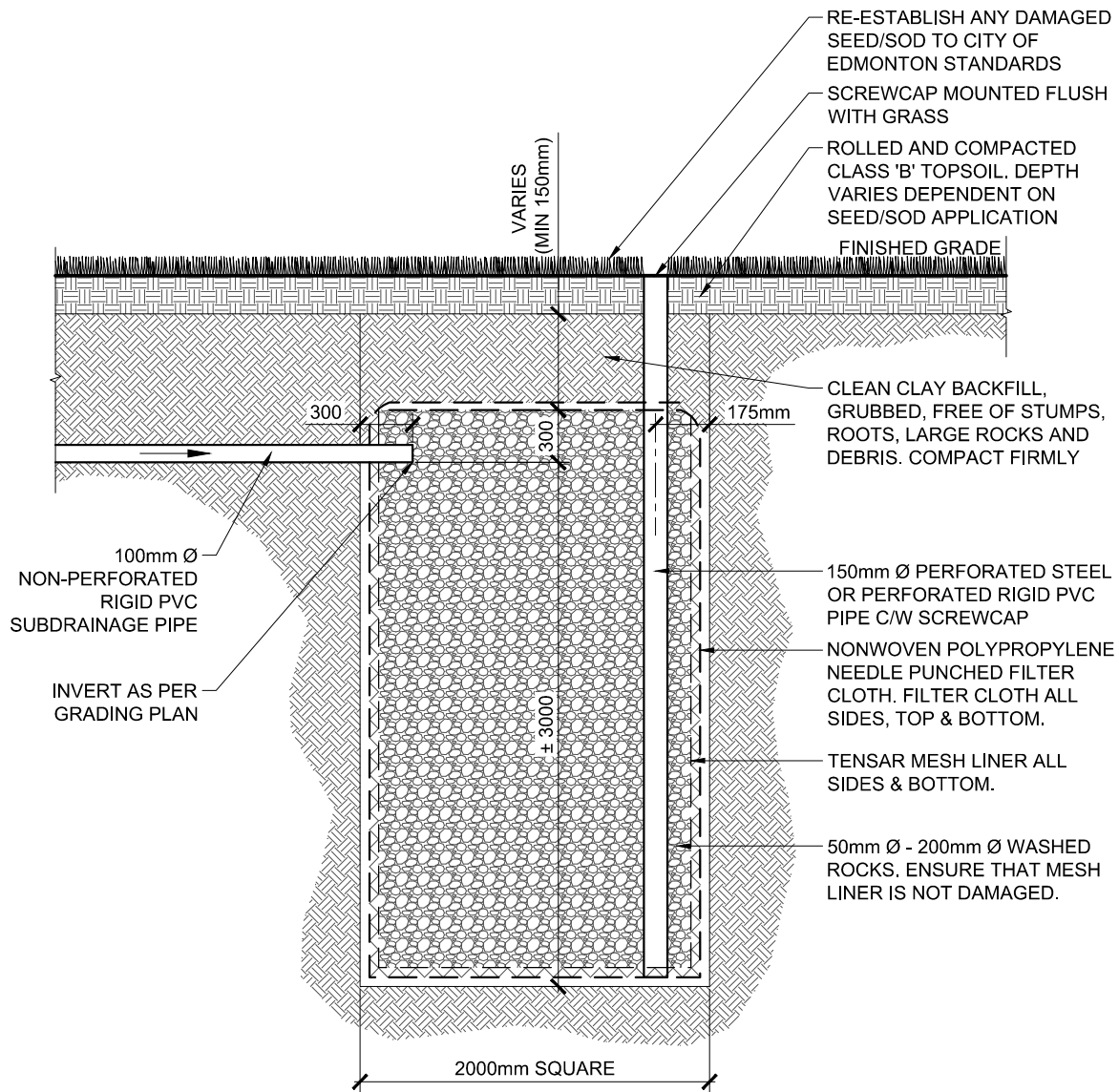
NOTES:

- MINIMUM 1.0% SLOPE ON ALL SUBDRAINAGE PIPE.



TYPICAL SUBDRAINAGE PIPE CONNECTIONS

| | | | | |
|-----------------------------|----------------------------------|--|----------|--------------------------|
| Date Approved: SEPT 2013 | Drawn By: PARKS PLANNING |  | Revision | Drawing No. LA201 |
| Scale: N.T.S. | Checked By: PARKS PLANNING | | | Old Drawing No. SP105 |

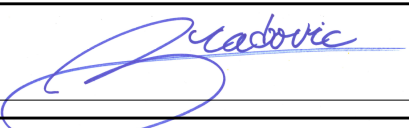


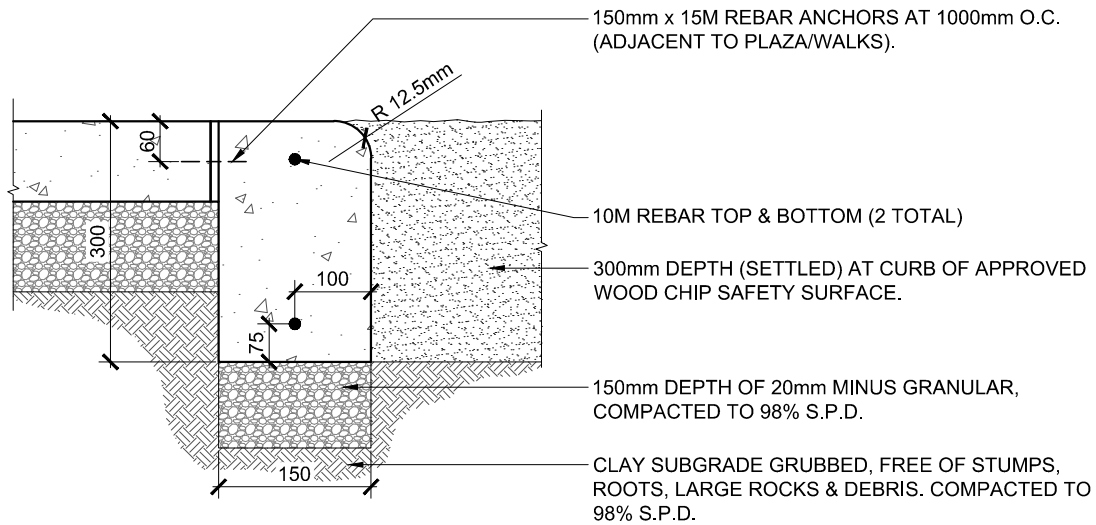
NOTES:

- SPECIFICATIONS: ALL COMPONENTS AND WORKMANSHIP CONFORM TO SPECIFICATION SECTION 02318 TRENCH AND BACKFILL AS WELL AS RELATED SECTIONS.

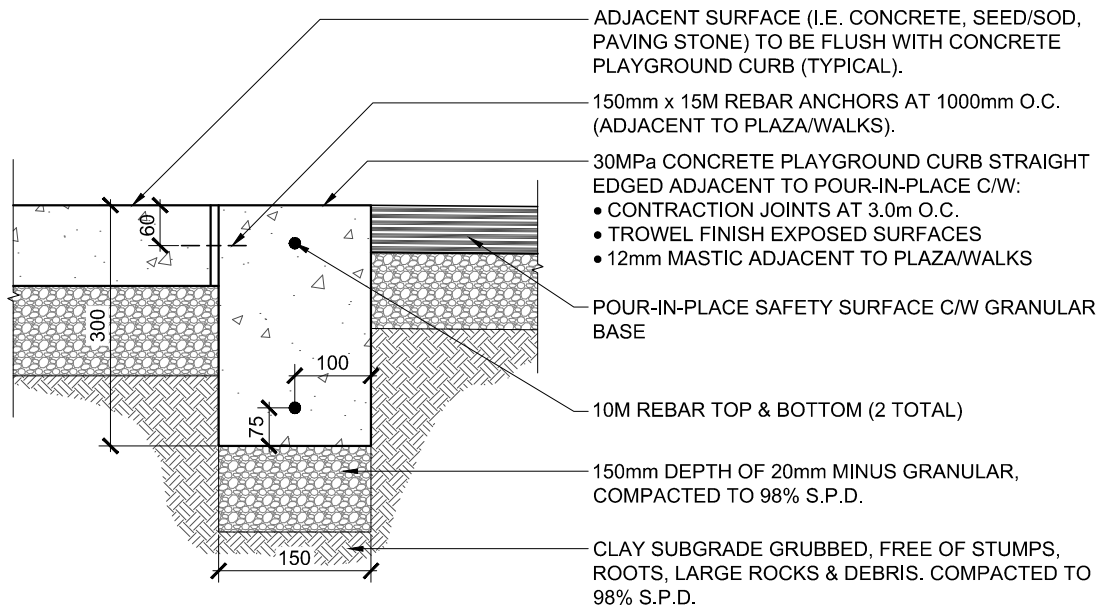


PLAYGROUND DRAINAGE SUMP

| | | | | |
|-----------------------------|----------------------------------|---|----------|---------------------------|
| Date Approved: SEPT 2013 | Drawn By: PARKS PLANNING | Approved:  | Revision | Drawing No. LA202 |
| Scale: N.T.S. | Checked By: PARKS PLANNING | | | Old Drawing No. SP105b |



PLAYGROUND CURB ADJACENT WOOD MULCH



PLAYGROUND CURB ADJACENT POUR-IN-PLACE SURFACE

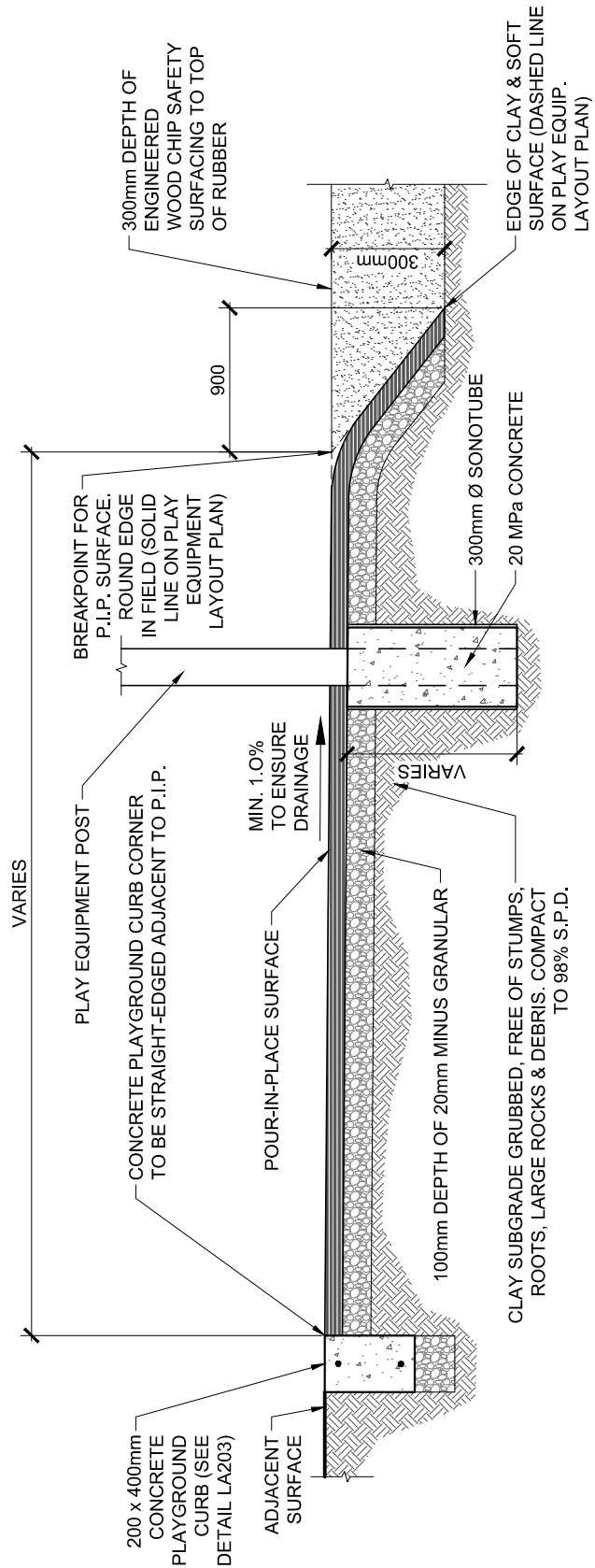
NOTES:

- 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. - |

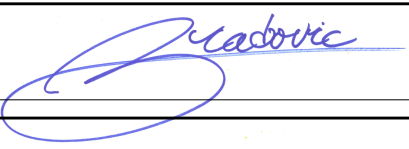


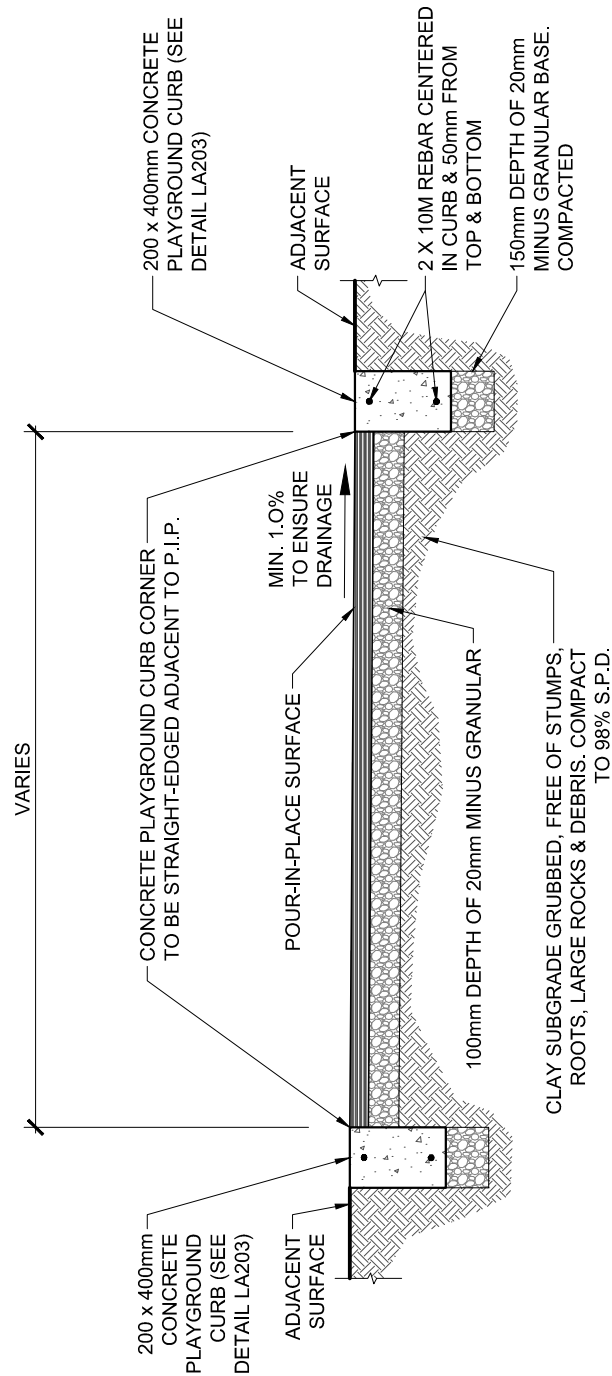
NOTES:

- 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. - |



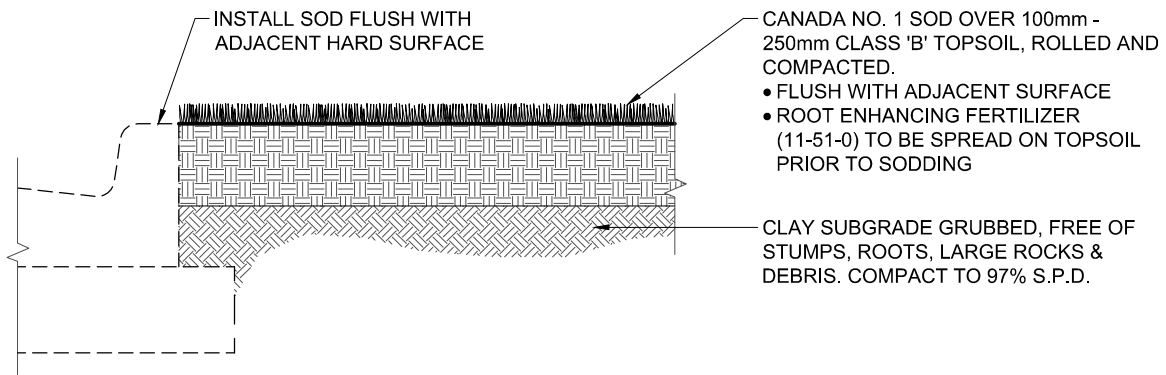
NOTES:

- 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.

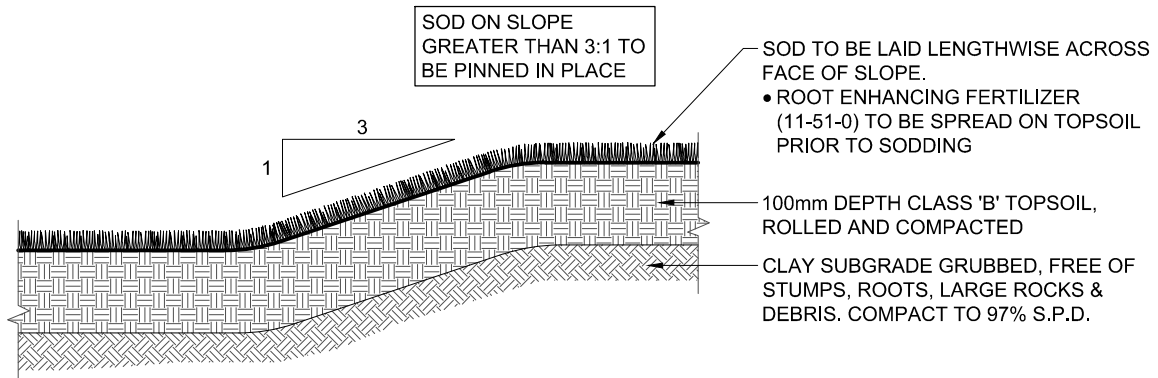


POUR-IN-PLACE PLAYGROUND SAFETY SURFACE - ALL RUBBER

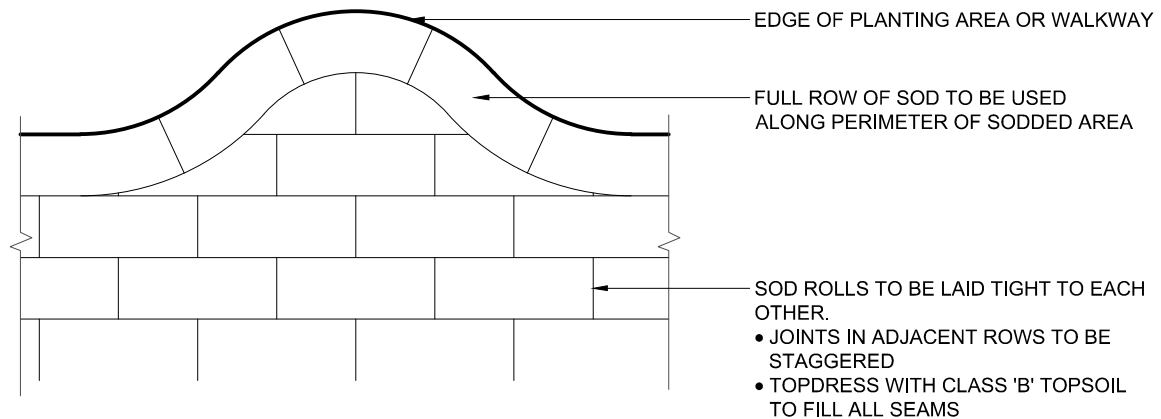
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|-----------------------------|----------------------------------|---|----------|-----------------------|
| Date Approved: SEPT 2013 | Drawn By: PARKS PLANNING | Approved:  | Revision | Drawing No. LA204A |
| Scale: N.T.S. | Checked By: PARKS PLANNING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



CROSS SECTION



CROSS SECTION THROUGH SLOPE



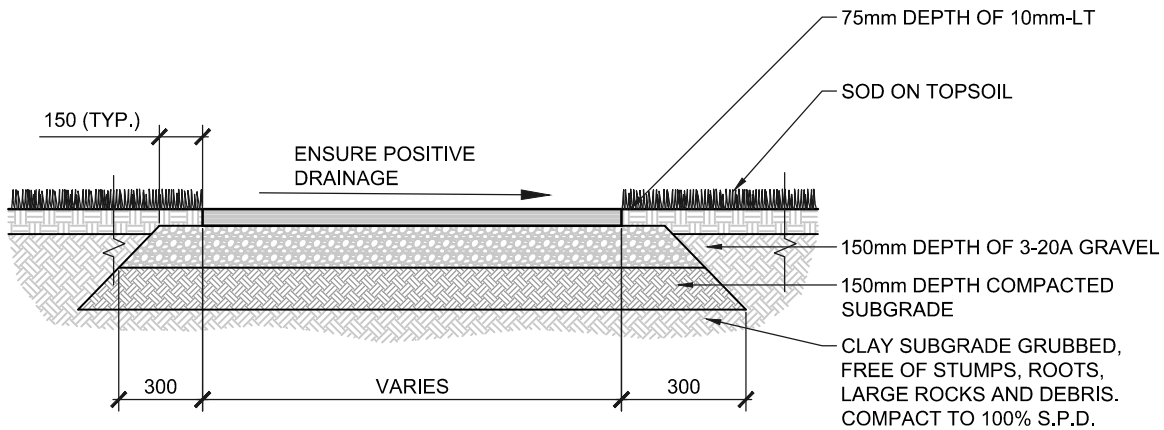
PLAN VIEW

NOTES:

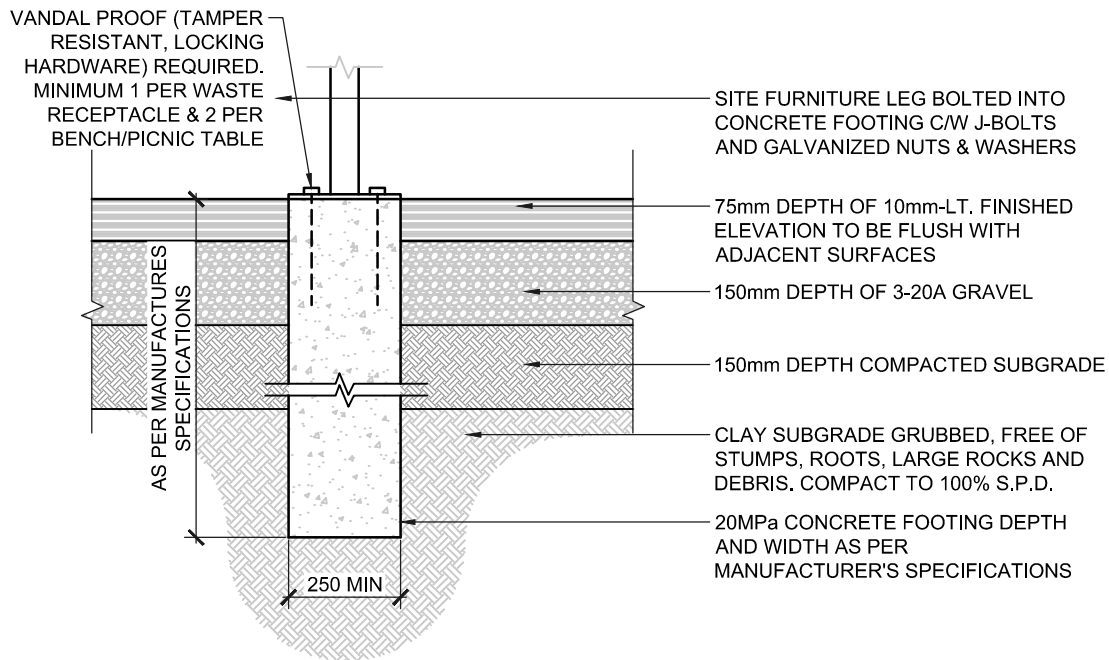
- SPECIFICATIONS: ALL COMPONENTS AND WORKMANSHIP CONFORM TO SPECIFICATION SECTION 02920 SEED AND SOD AS WELL AS THE RELATED SECTIONS.

Edmonton THE CITY OF **SOD INSTALLATION**

| | | | | |
|-----------------------------|----------------------------------|-----------|----------|--------------------------|
| Date Approved: SEPT 2013 | Drawn By: PARKS PLANNING | Approved: | Revision | Drawing No. LA300 |
| Scale: N.T.S. | Checked By: PARKS PLANNING | | | Old Drawing No. SP402 |



ASPHALT CROSS SECTION (TYP.)



SITE FURNITURE FOOTING WITHIN ASPHALT AREA

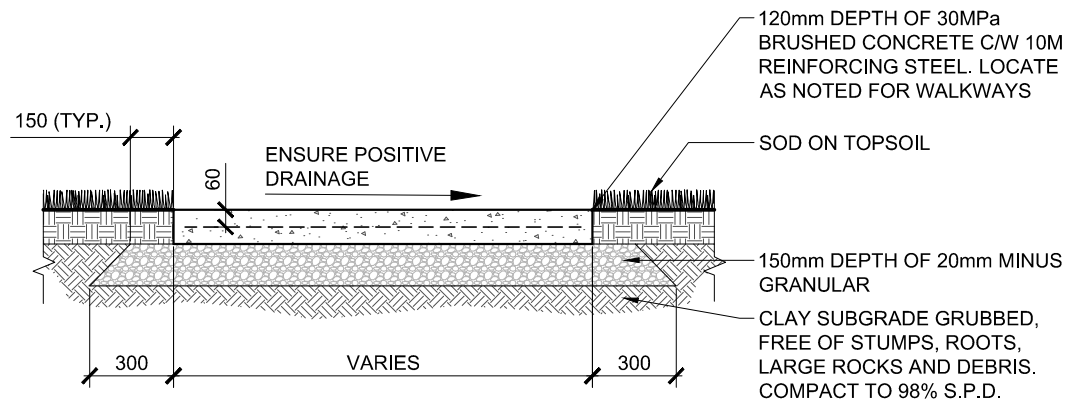
NOTES:

- 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.

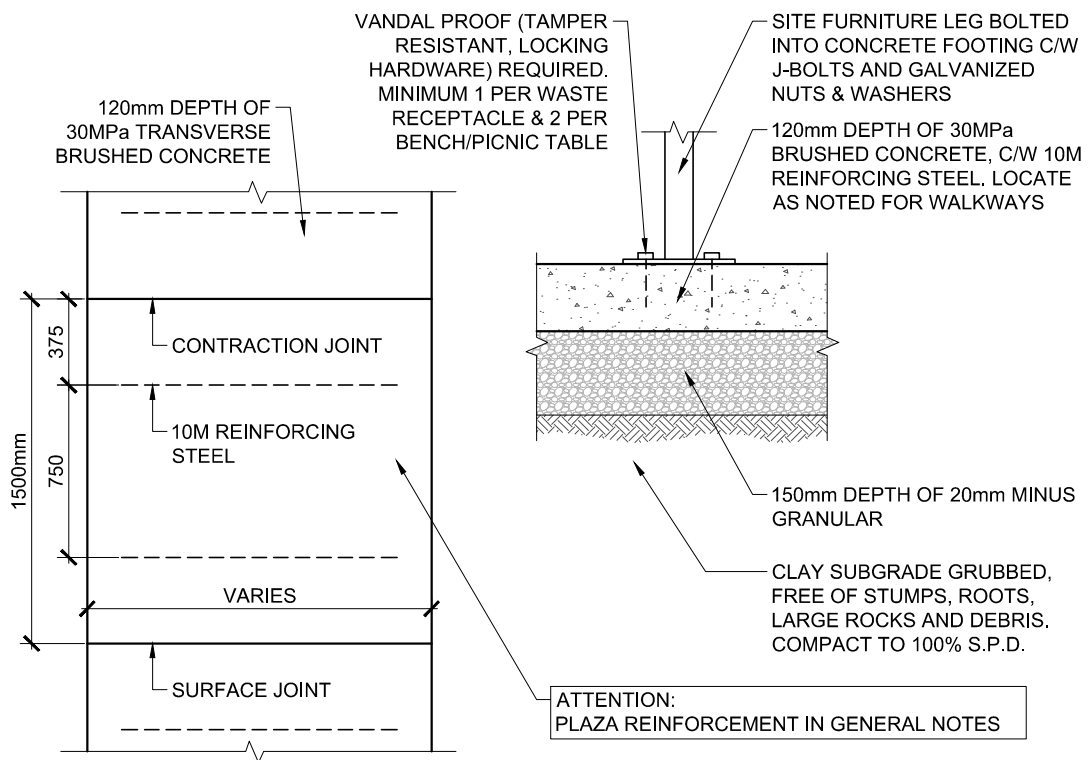


ASPHALT WALKWAY OR PLAZA

| | | | | |
|-----------------------------|----------------------------------|--|----------|----------------------|
| Date Approved: JUNE 2015 | Drawn By: PARKS PLANNING | Approved: <i>Frank Gasparik</i> | Revision | Drawing No. LA301 |
| Scale: N.T.S. | Checked By: PARKS PLANNING | | | Old Drawing No. - |



CONCRETE CROSS SECTION (TYP.)



CONCRETE WALKWAY PLAN VIEW

SITE FURNITURE WITHIN CONCRETE AREA

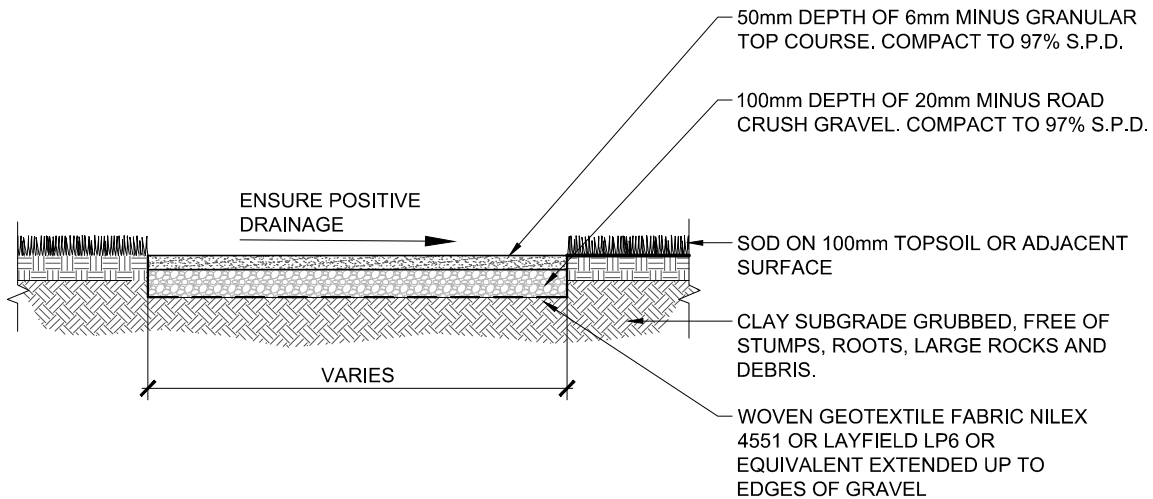
NOTES:

- 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.

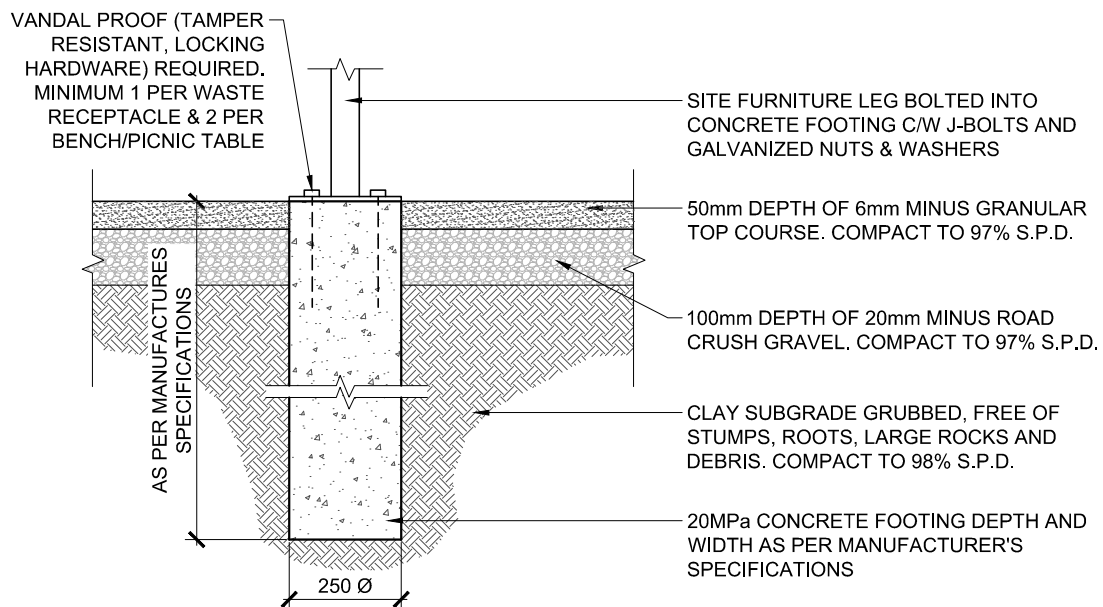


CONCRETE WALKWAY OR PLAZA

| | | | | |
|-----------------------------|----------------------------------|---------------|----------|----------------------|
| Date Approved: SEPT 2013 | Drawn By: PARKS PLANNING | Approved: | Revision | Drawing No. LA302 |
| Scale: N.T.S. | Checked By: PARKS PLANNING | | | Old Drawing No. - |



GRANULAR CROSS SECTION (TYP.)



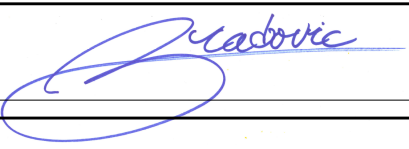
SITE FURNITURE FOOTING WITHIN GRANULAR AREA

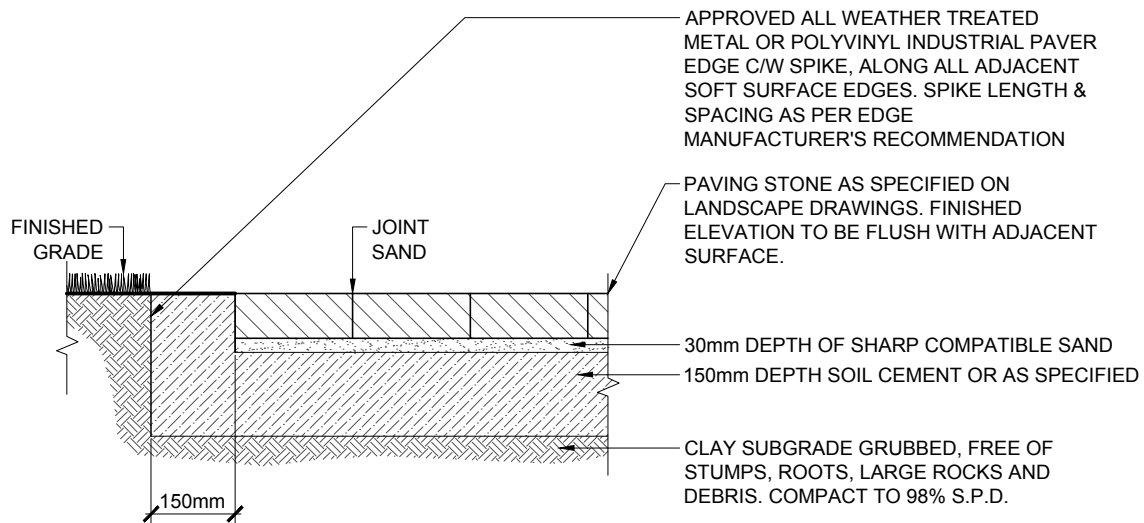
NOTES:

- 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.

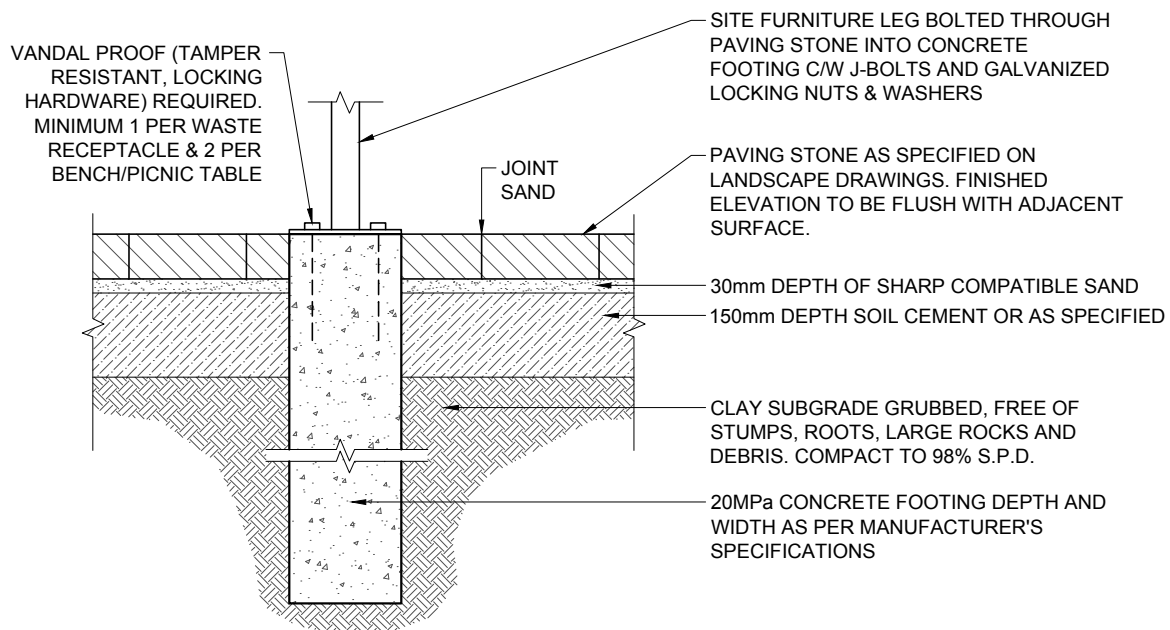


GRANULAR WALKWAY

| | | | | |
|-----------------------------|----------------------------------|---|----------|----------------------|
| Date Approved: SEPT 2013 | Drawn By: PARKS PLANNING | Approved:  | Revision | Drawing No. LA303 |
| Scale: N.T.S. | Checked By: PARKS PLANNING | | | Old Drawing No. - |



PAVING STONE CROSS SECTION (TYP.)



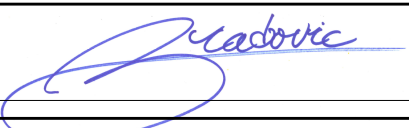
SITE FURNITURE FOOTING WITHIN PAVING STONE AREA

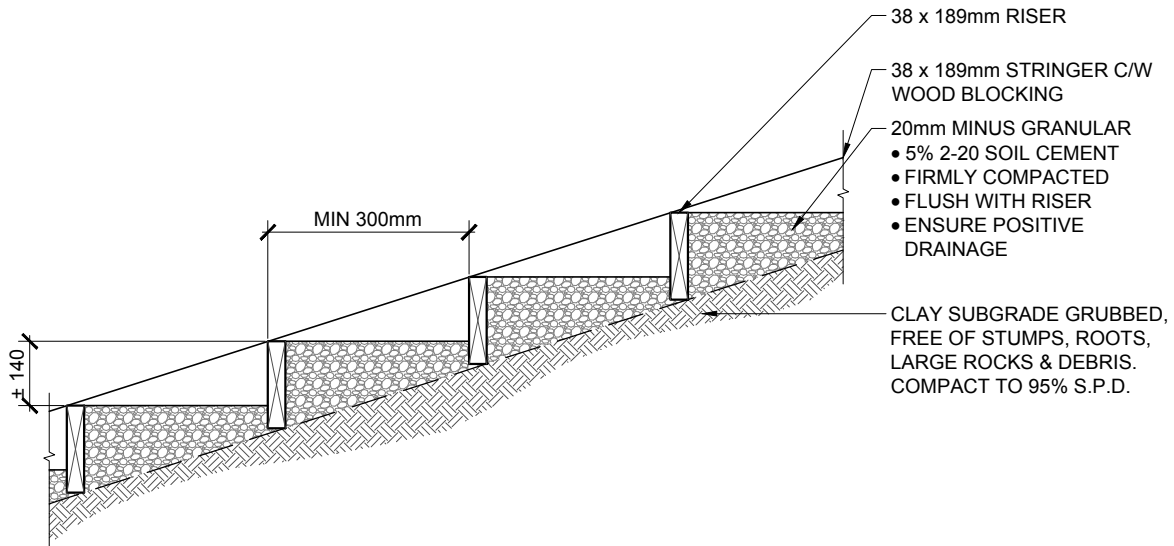
NOTES:

- 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.

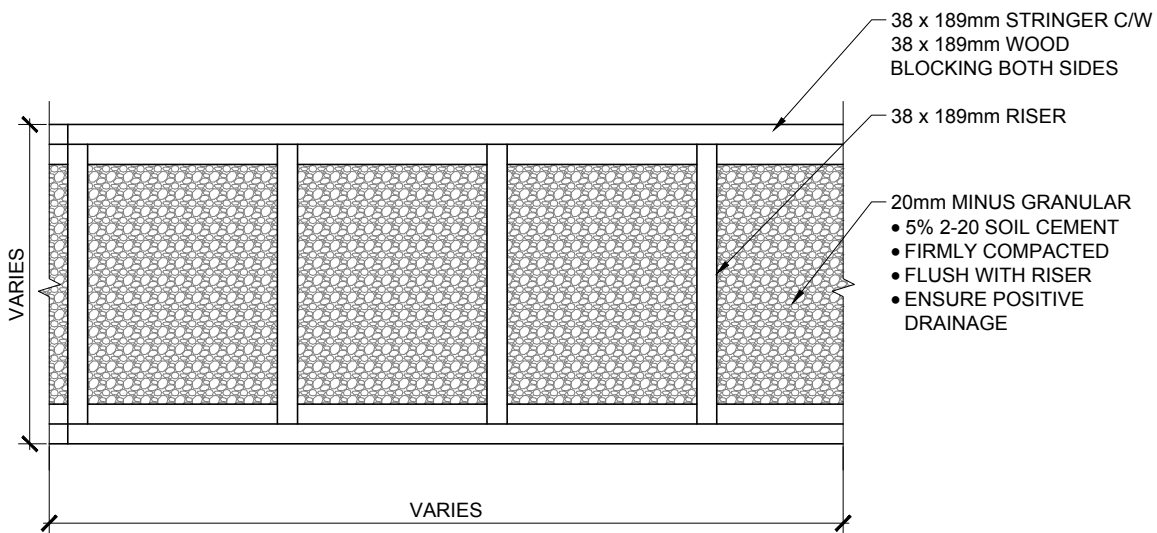


PAVING STONE WALKWAY OR PLAZA

| | | | | |
|-----------------------------|----------------------------------|---|----------|----------------------|
| 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

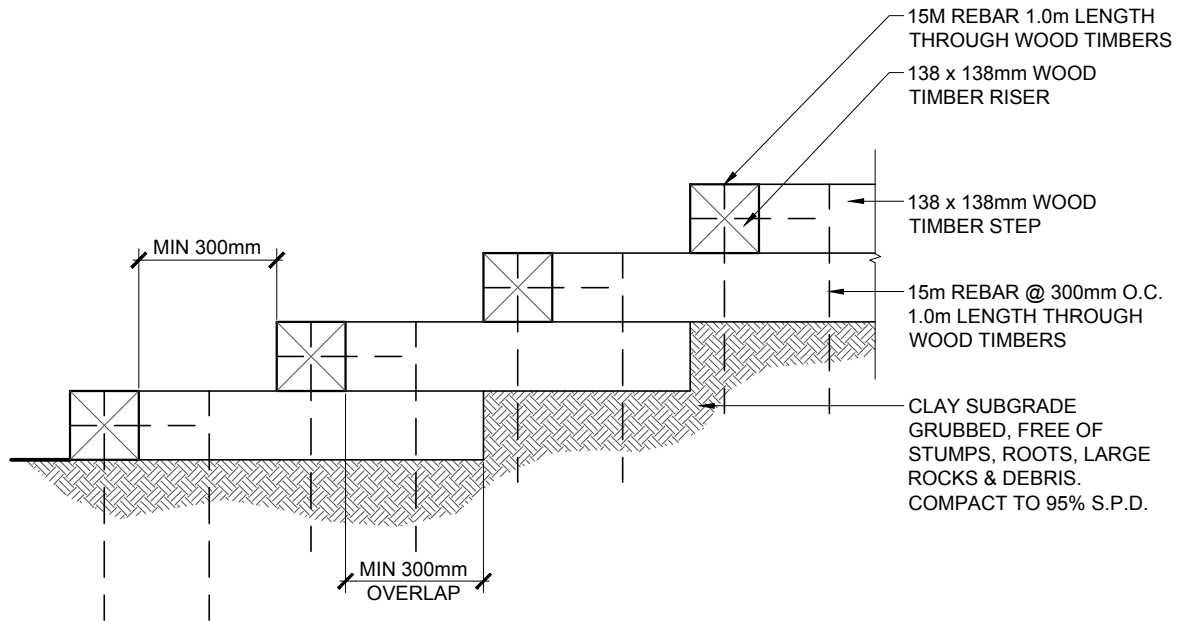
NOTES:

- 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.

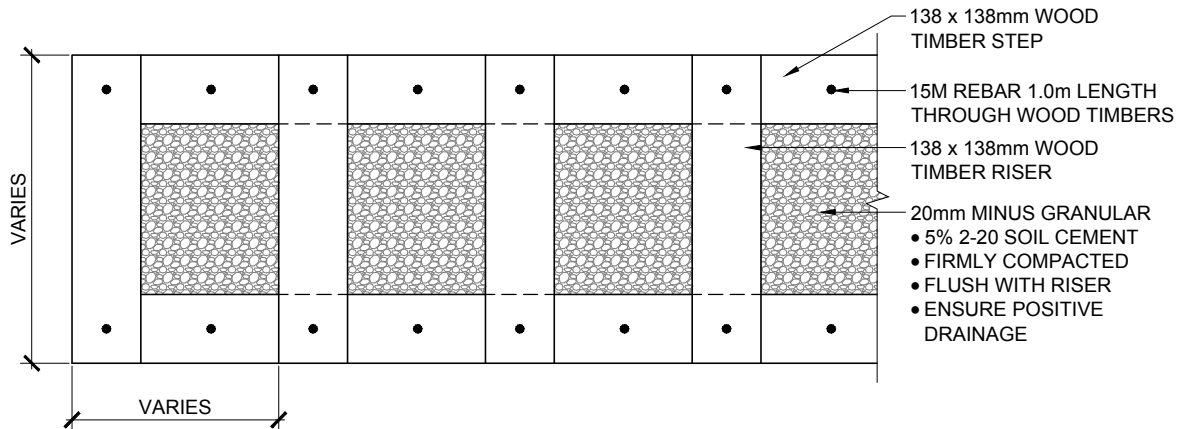


GRAVEL PLANK STEPS

| | | | | |
|-----------------------------|----------------------------------|---|----------|----------------------|
| 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

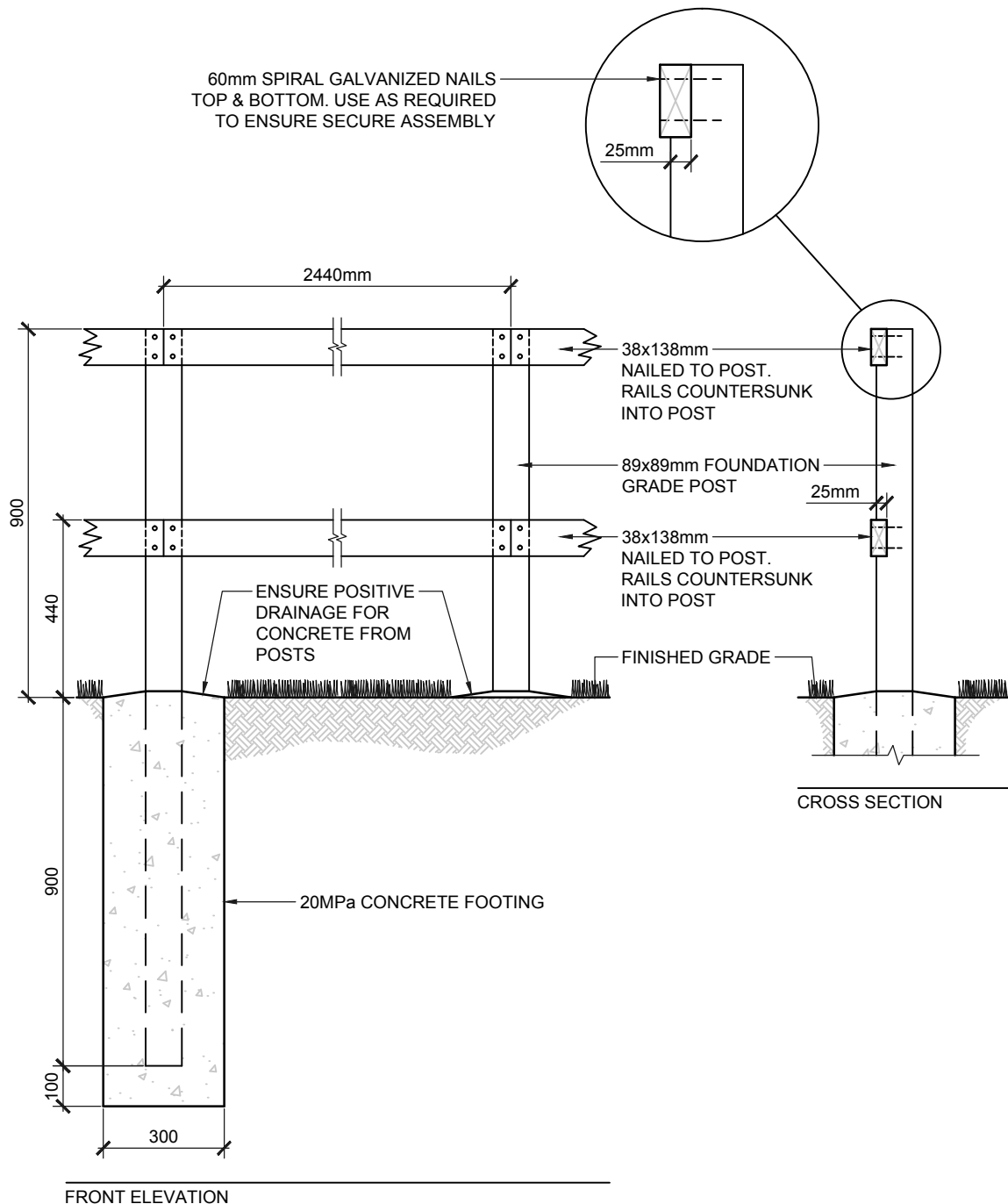
NOTES:

- 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. - |



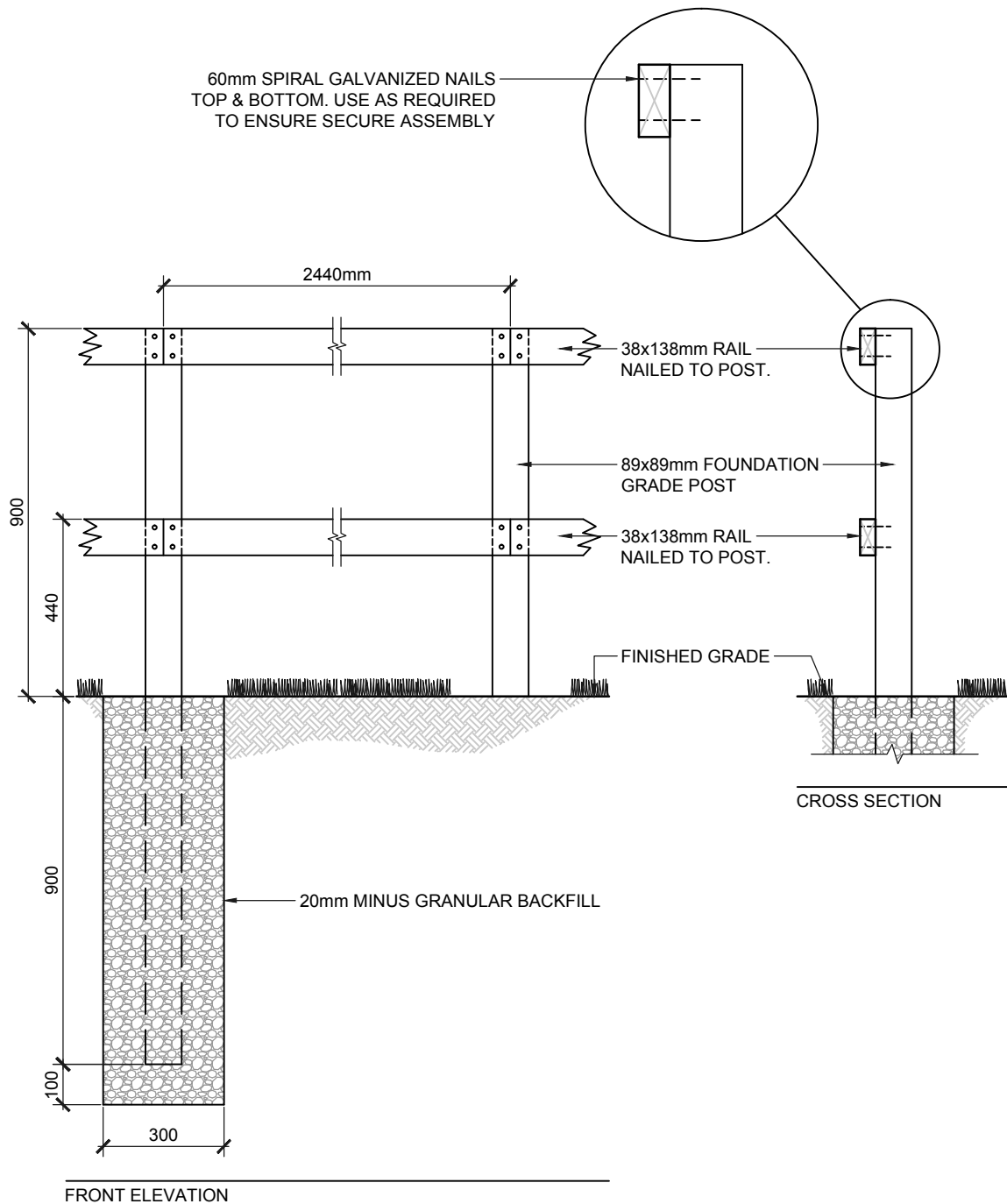
NOTES:

- 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. - |



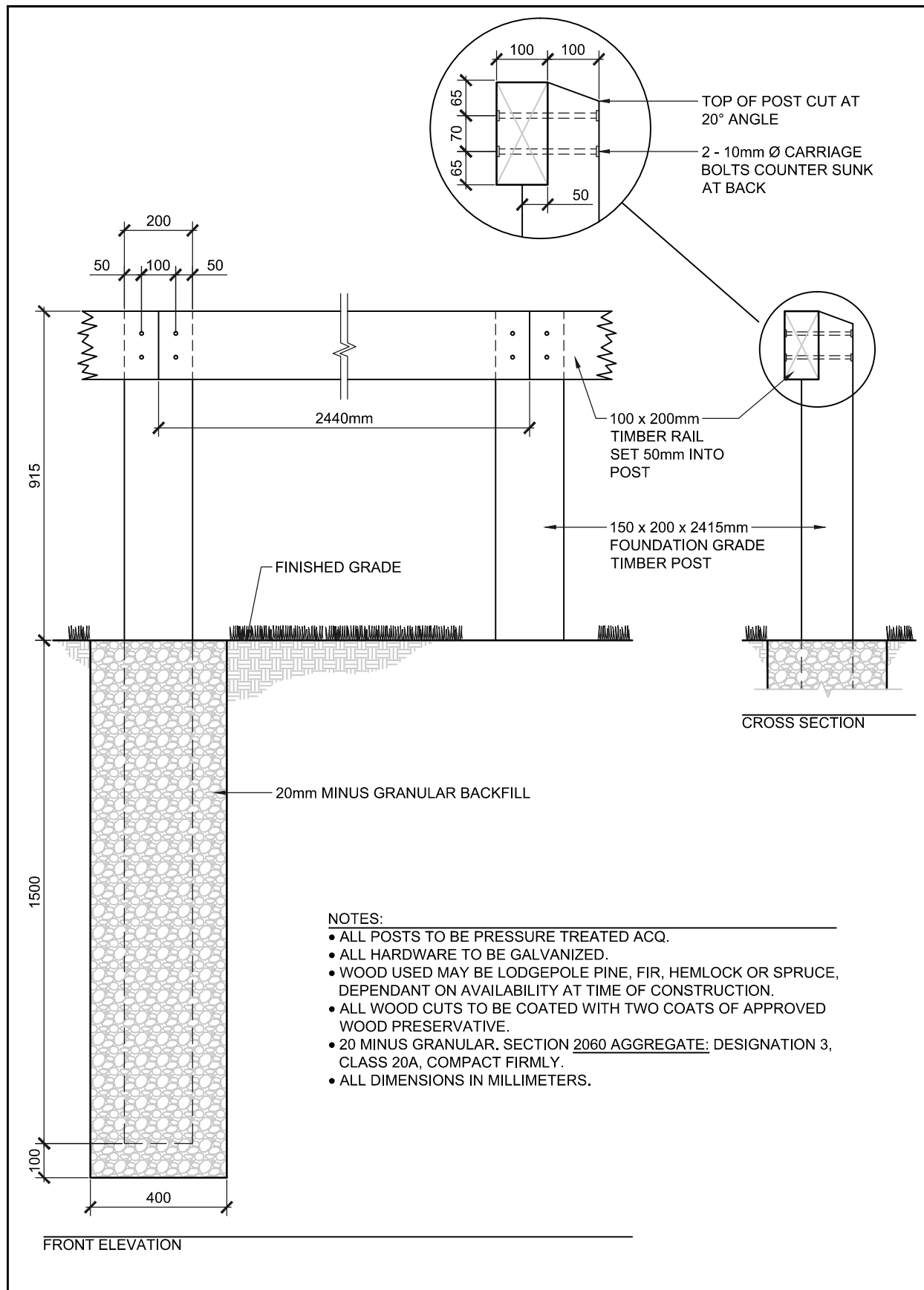
NOTES:

- 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
Checked By:
PARKS
PLANNING

Approved:

Frank Gasparik

Revision

Drawing No.

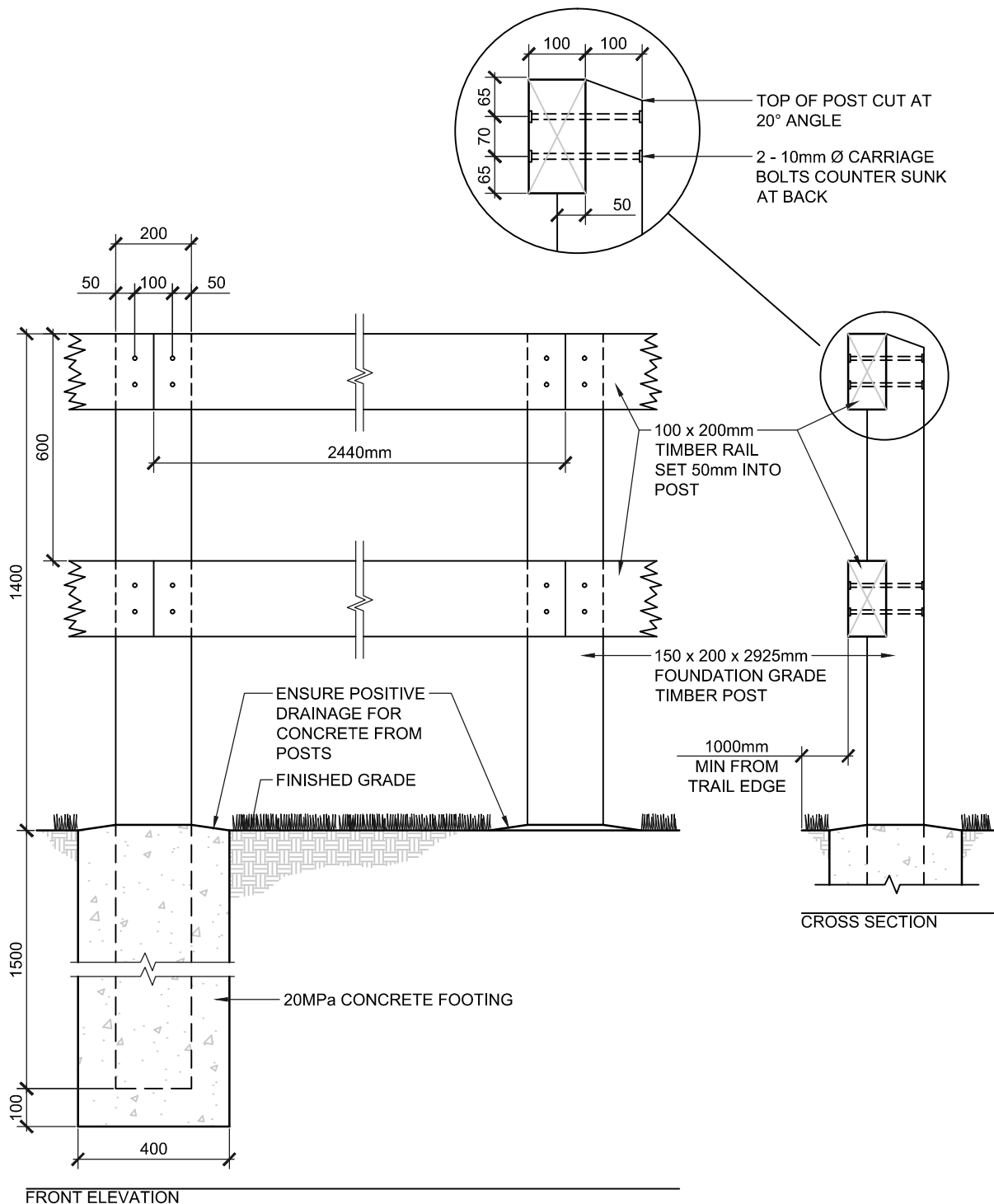
LA402

Scale:

N.T.S.

Old Drawing No.

SP300d



FRONT ELEVATION

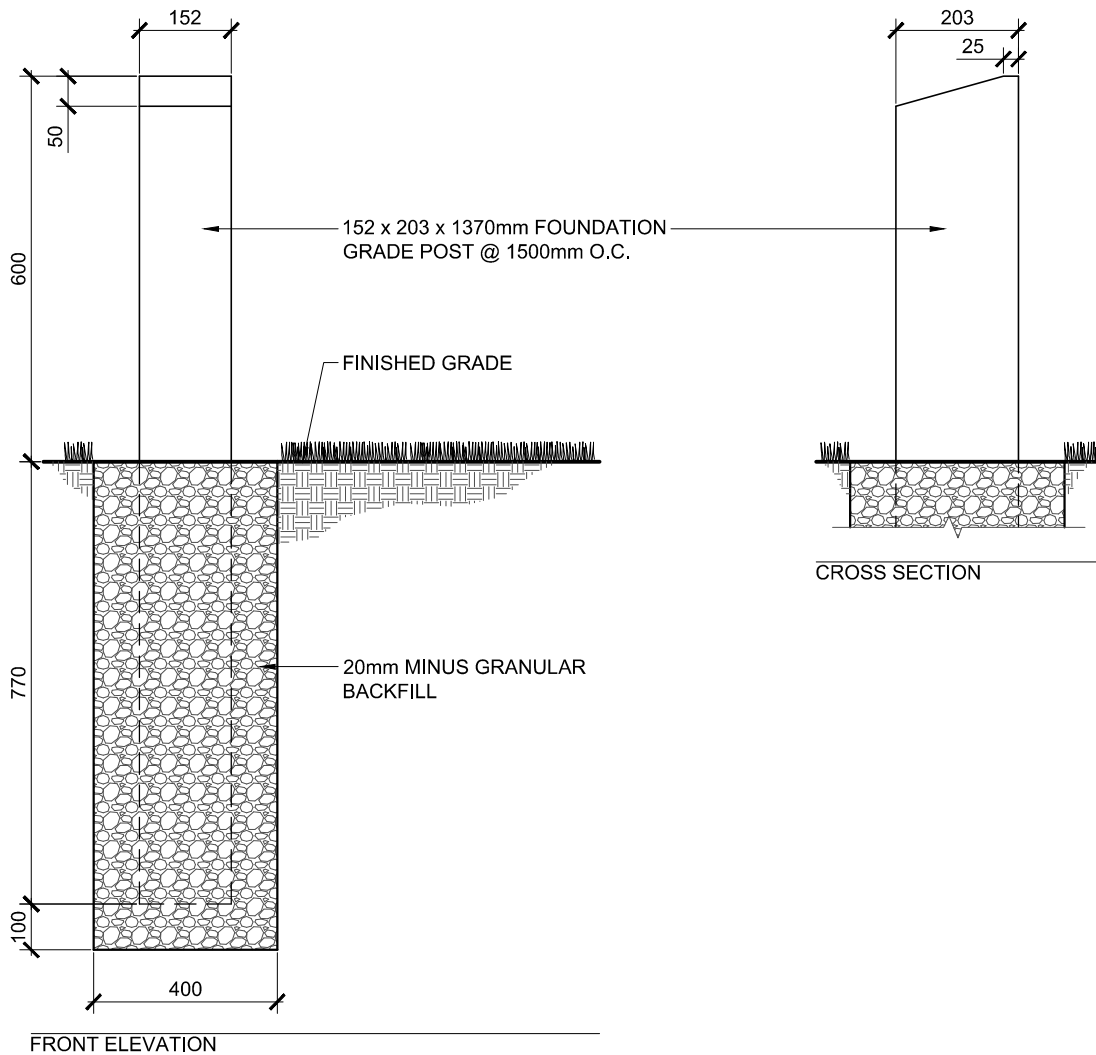
NOTES:

- 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.



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 |

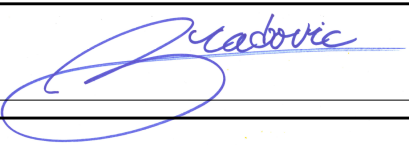


NOTES:

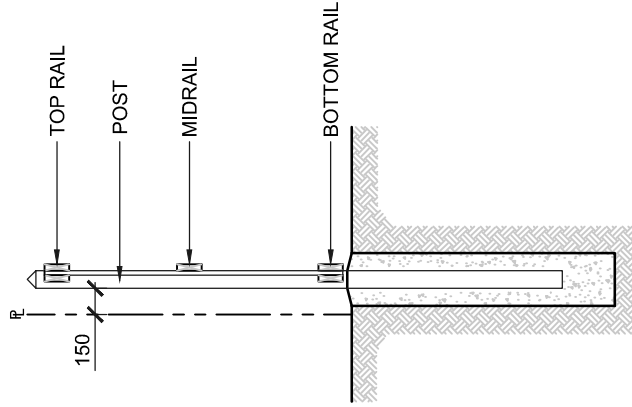
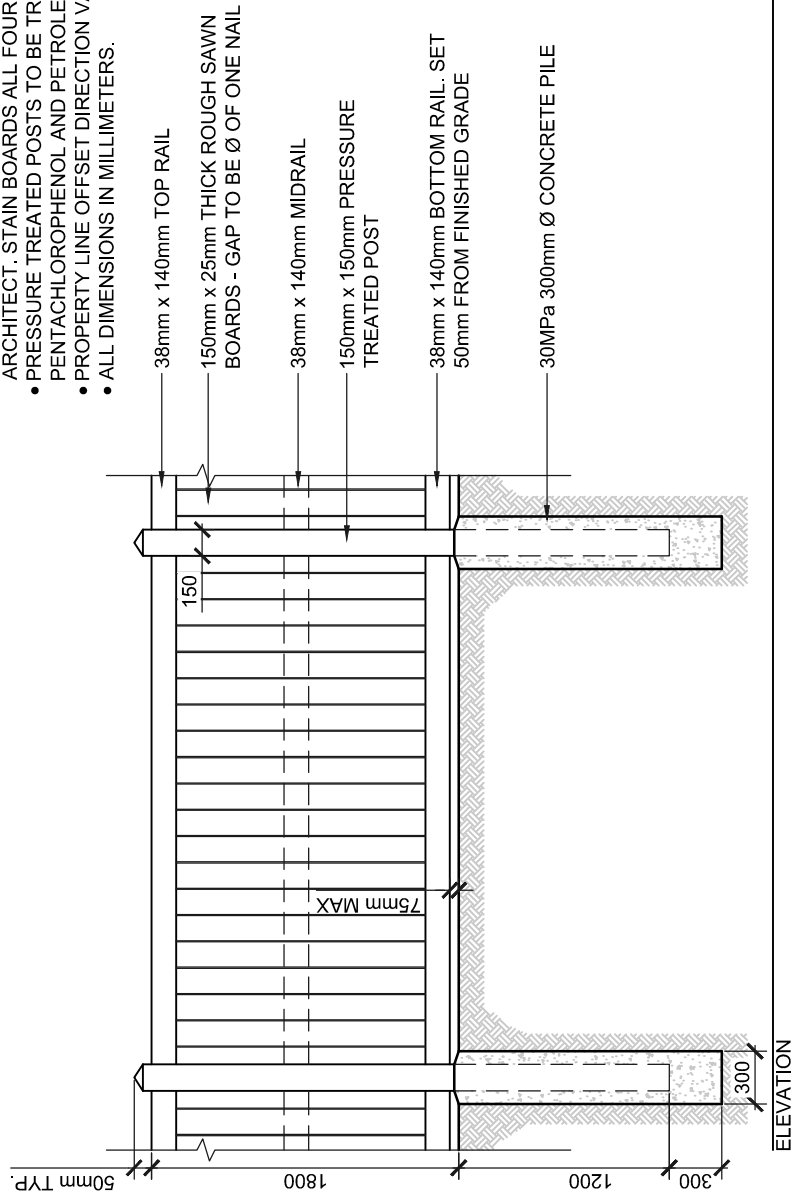
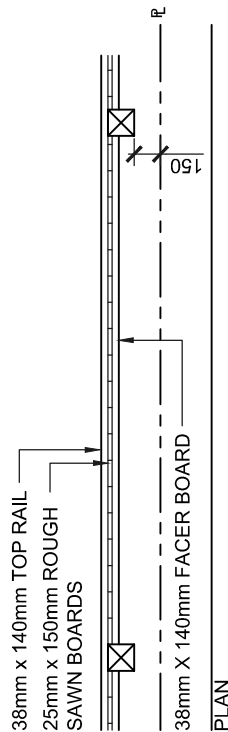
- ALL WOOD TO BE PRESSURE TREATED ACQ.
- WOOD USED MAY BE LODGEPOLE PINE, FIR, HEMLOCK OR SPRUCE, DEPENDANT ON AVAILABILITY AT TIME OF CONSTRUCTION.
- ALL WOOD CUTS TO BE COATED WITH TWO COATS OF APPROVED WOOD PRESERVATIVE.
- 20 MINUS GRANULAR. SECTION 2060 AGGREGATE: DESIGNATION 3, CLASS 20A, COMPACT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

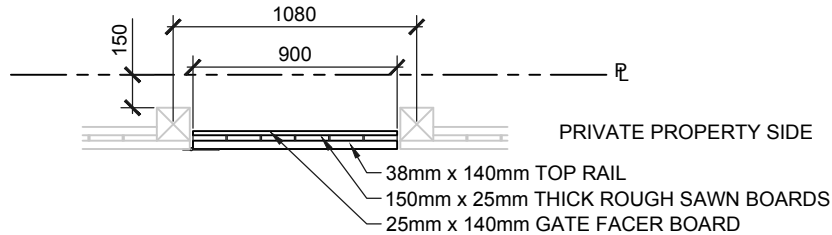


1800mm HEIGHT WOOD SCREEN FENCE

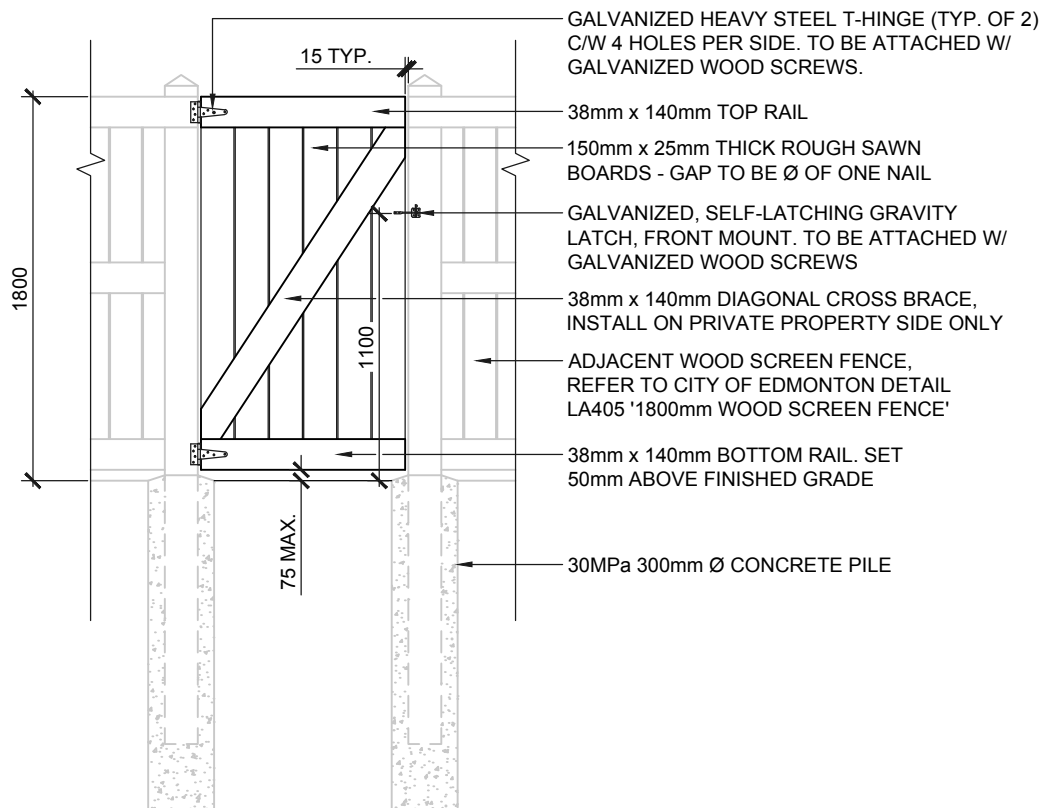
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|-----------------------------|----------------------------------|--|----------|----------------------|
| Date Approved: JUNE 2016 | Drawn By: PARKS PLANNING | Approved:  | Revision | Drawing No. LA405 |
| Scale: N.T.S. | Checked By: PARKS PLANNING | | | Old Drawing No. - |

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

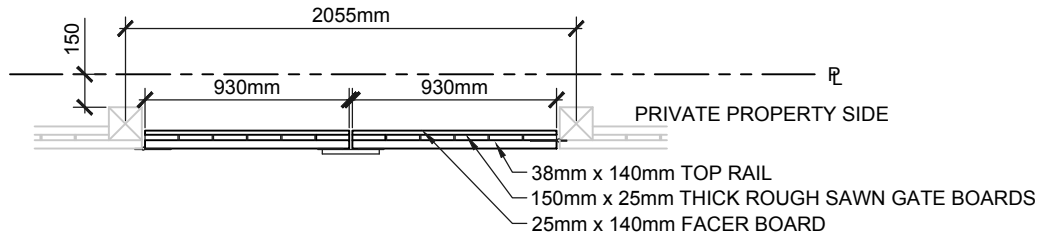


1800mm WOOD FENCE GATE - SINGLE

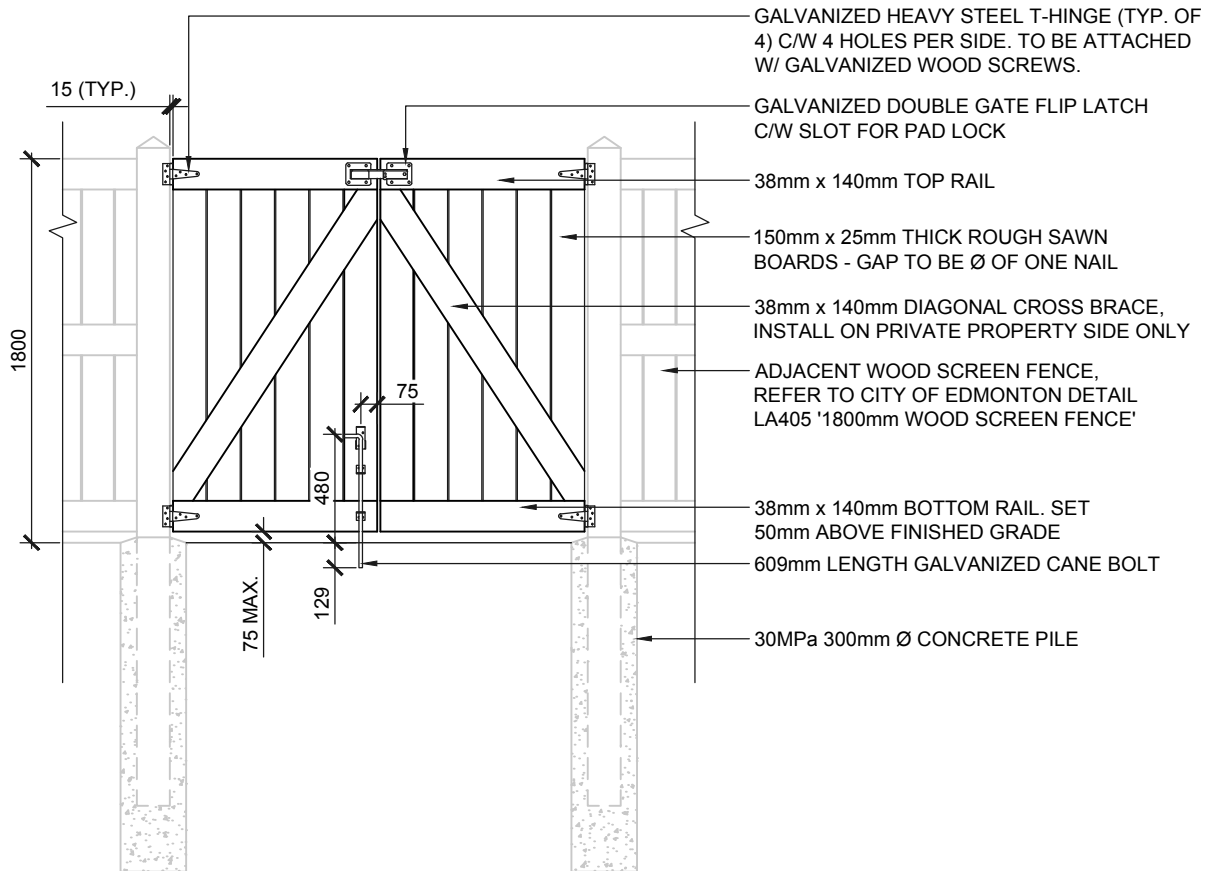
| | | | | |
|-----------------------------|----------------------------------|--|----------|------------------------|
| Date Approved: JUNE 2015 | Drawn By: PARKS PLANNING | Approved: <i>Frank Gasparik</i> | Revision | Drawing No. LA405A |
| Scale: N.T.S. | Checked By: PARKS PLANNING | | | Old Drawing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

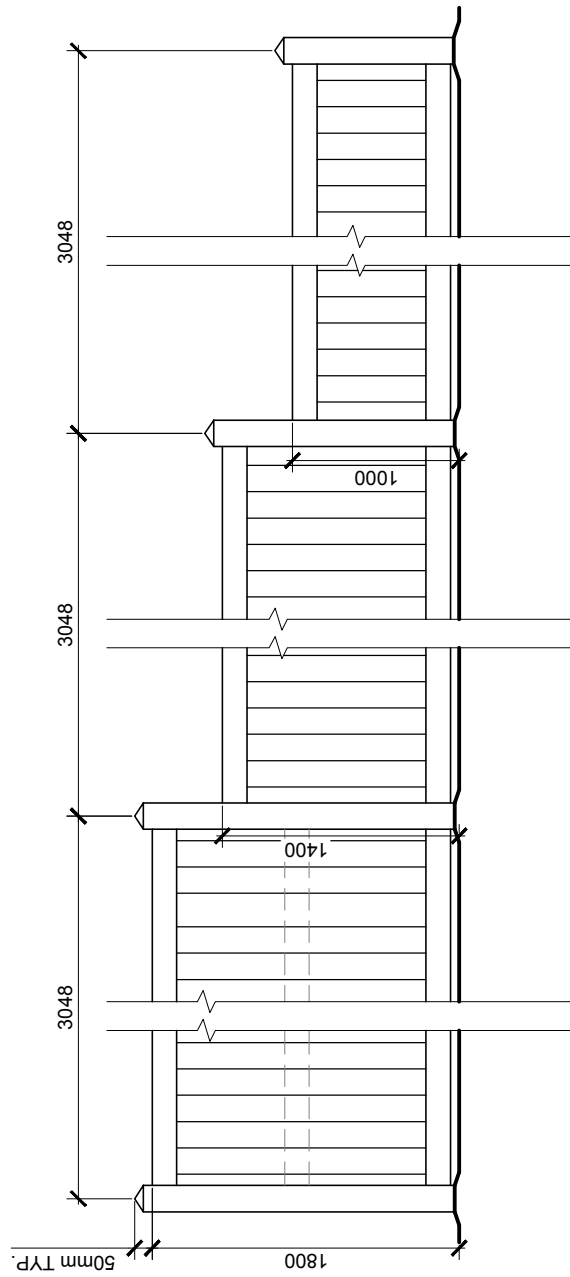


ELEVATION



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 |



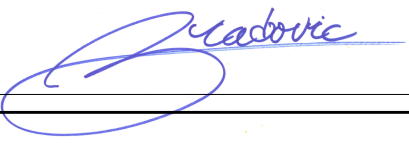
ELEVATION

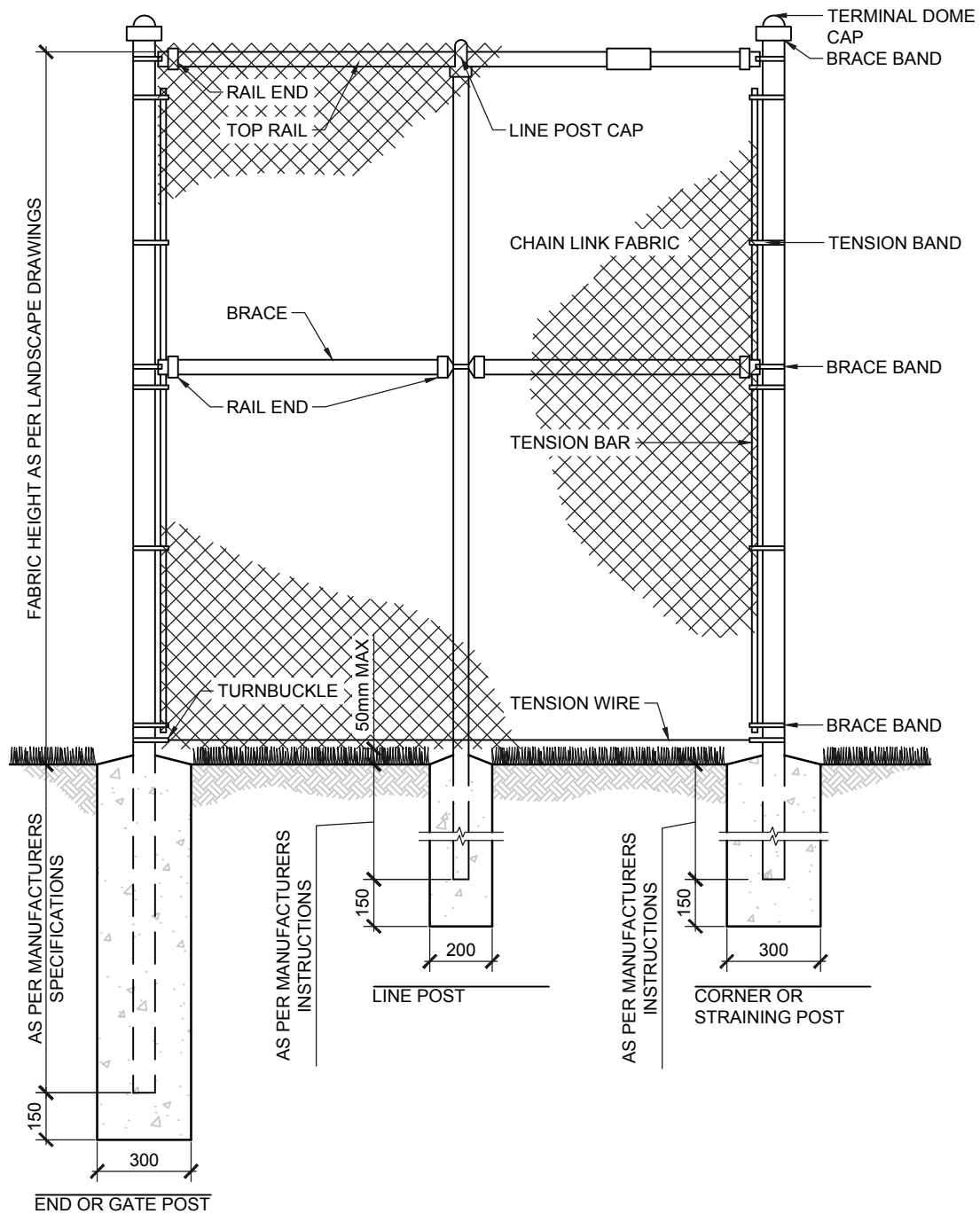
NOTES:

- 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 |  | Revision | Drawing No. LA406 |
| Scale: N.T.S. | Checked By: PARKS PLANNING | | | Old Drawing No. - |



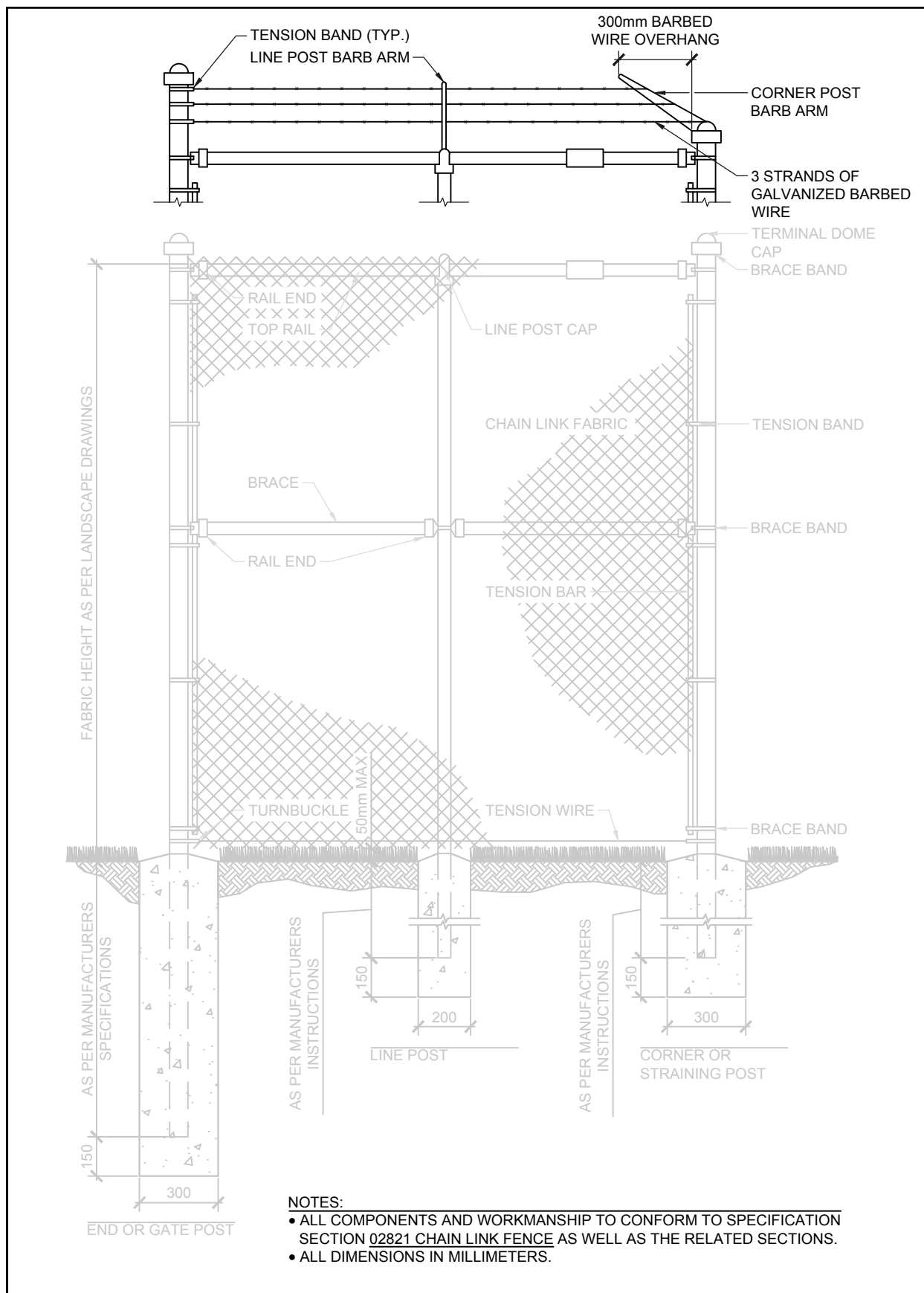
NOTES:

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



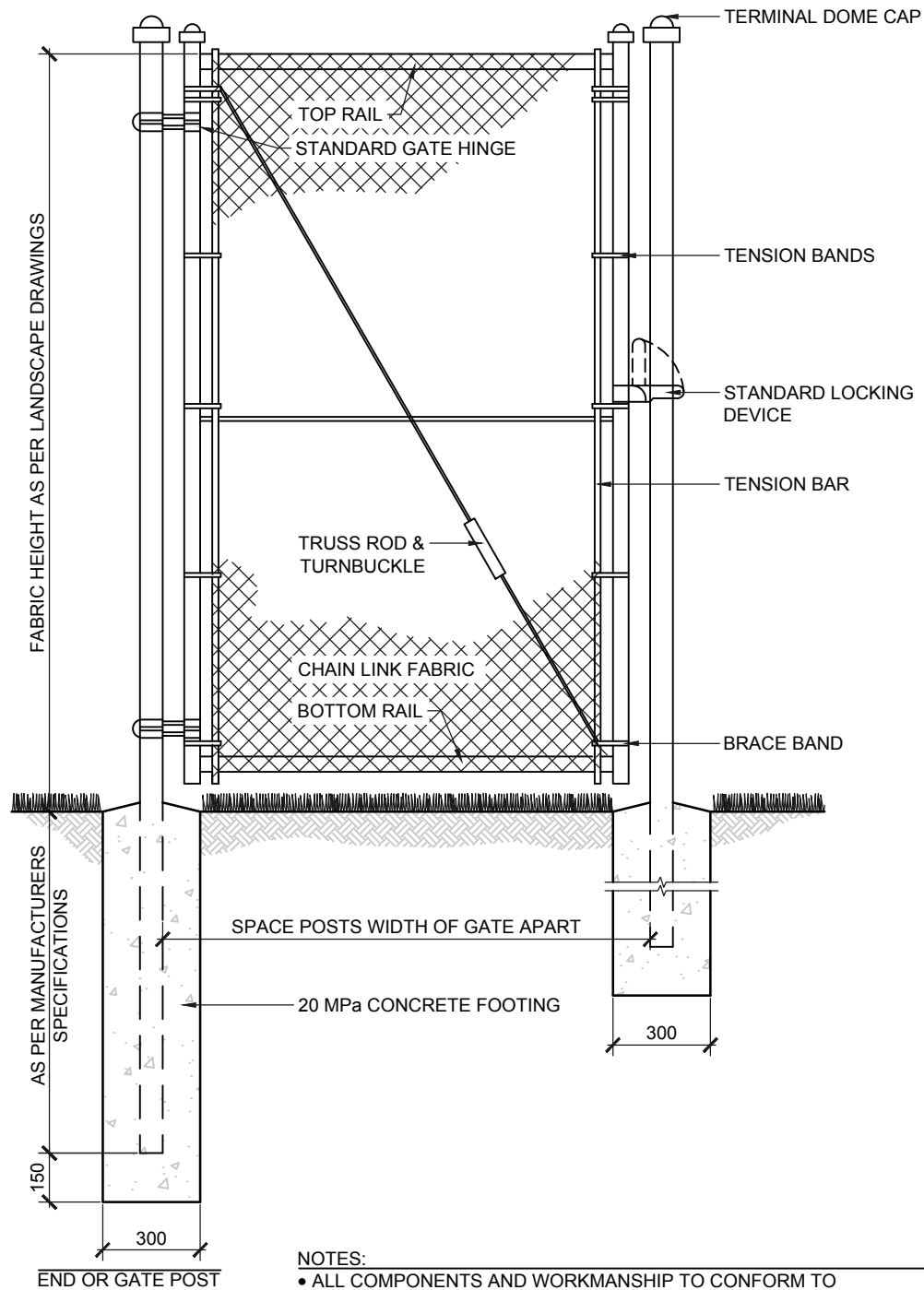
CHAIN LINK FENCE

| | | | | |
|-----------------------------|----------------------------------|--|----------|-------------------------|
| 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 |



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:

Frank Gasparik

Revision

Drawing No.

LA408

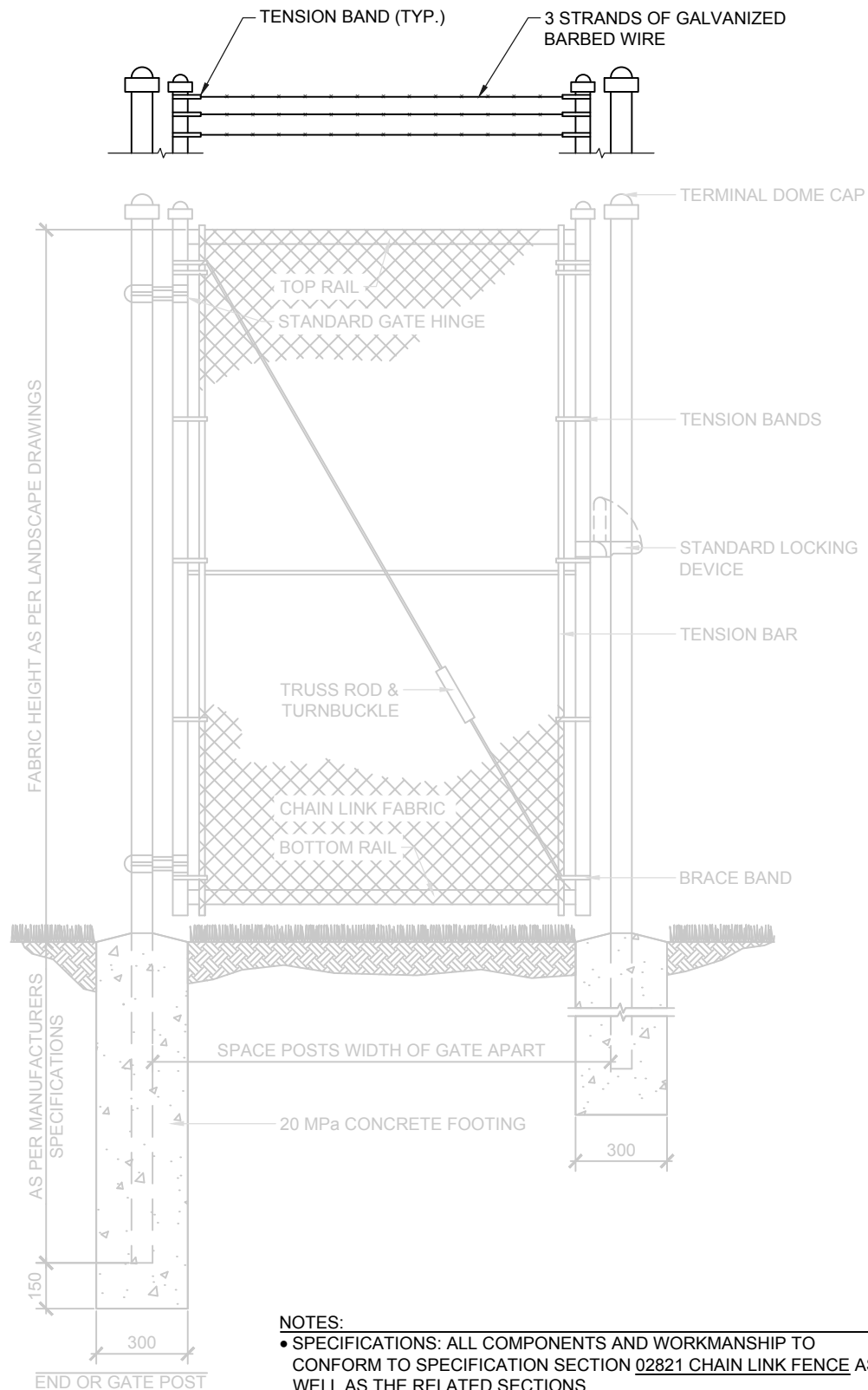
Scale:

N.T.S.

Checked By:
PARKS
PLANNING

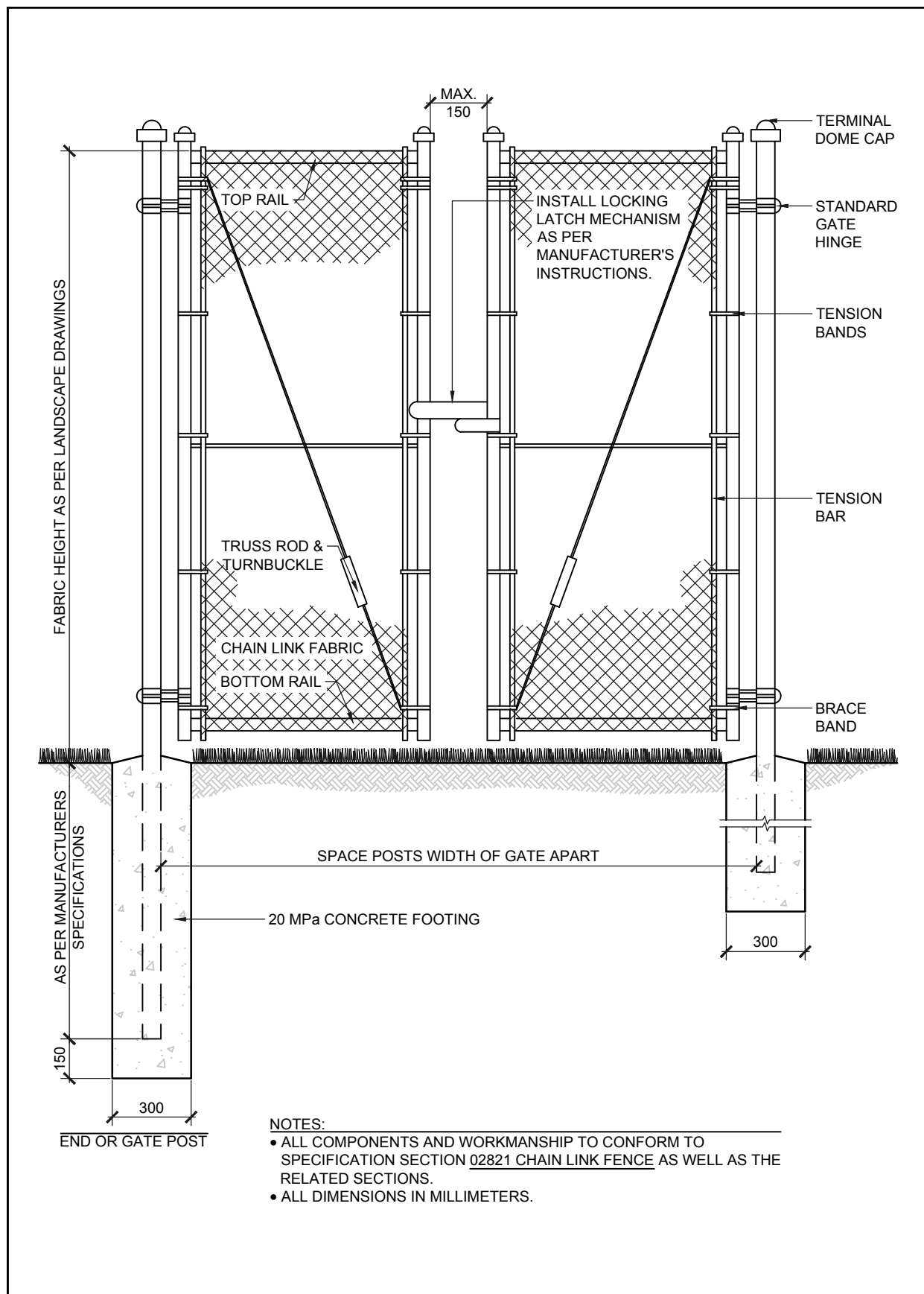
Old Drawing No.

9452



BARBED WIRE FOR CHAIN LINK FENCE SINGLE GATE

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

Date Approved:
JUNE 2015

Drawn By:
PARKS
PLANNING

Approved:

Frank Gasparik

Revision

Drawing No.

LA409

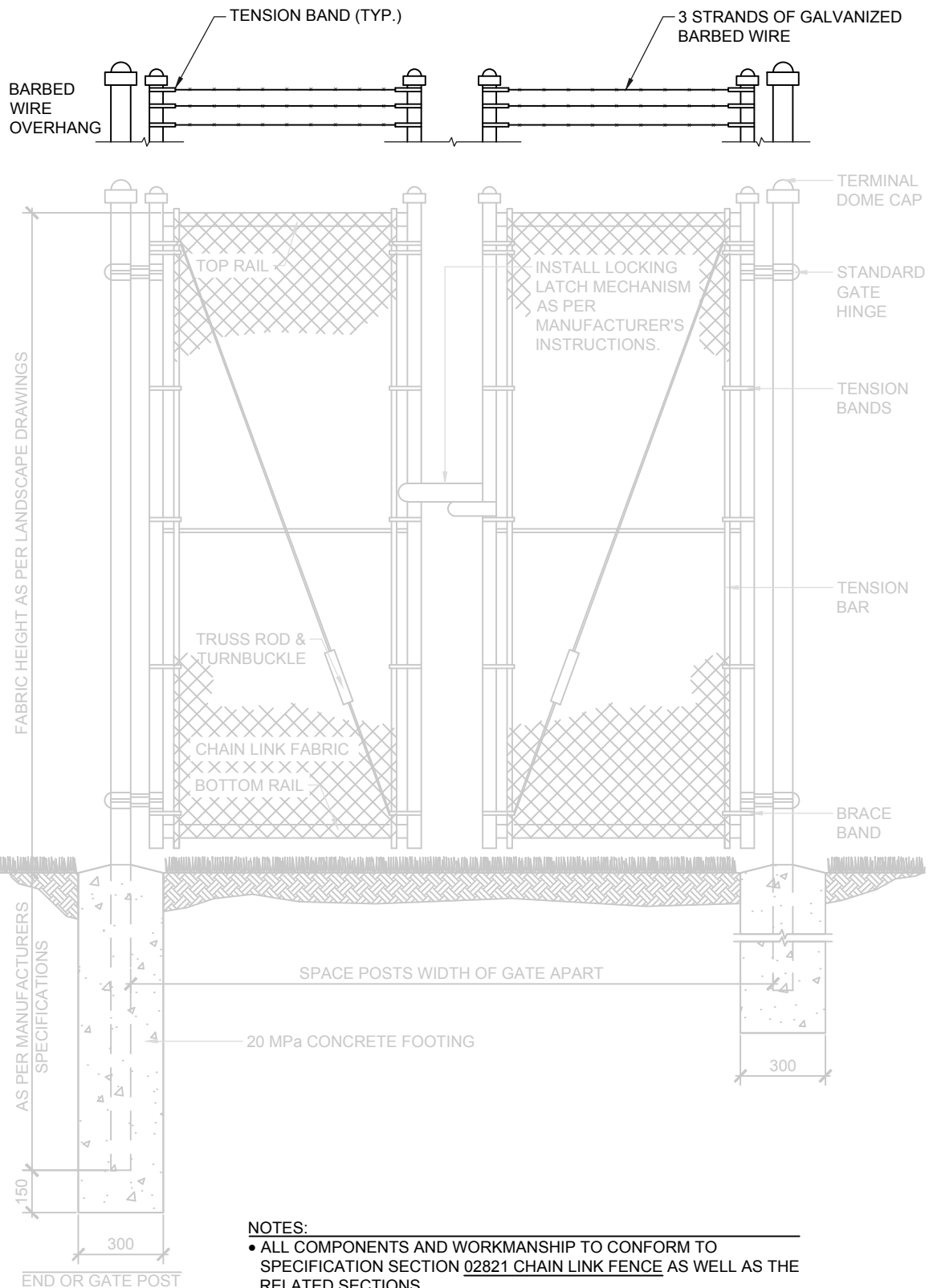
Scale:

N.T.S.

Checked By:
PARKS
PLANNING

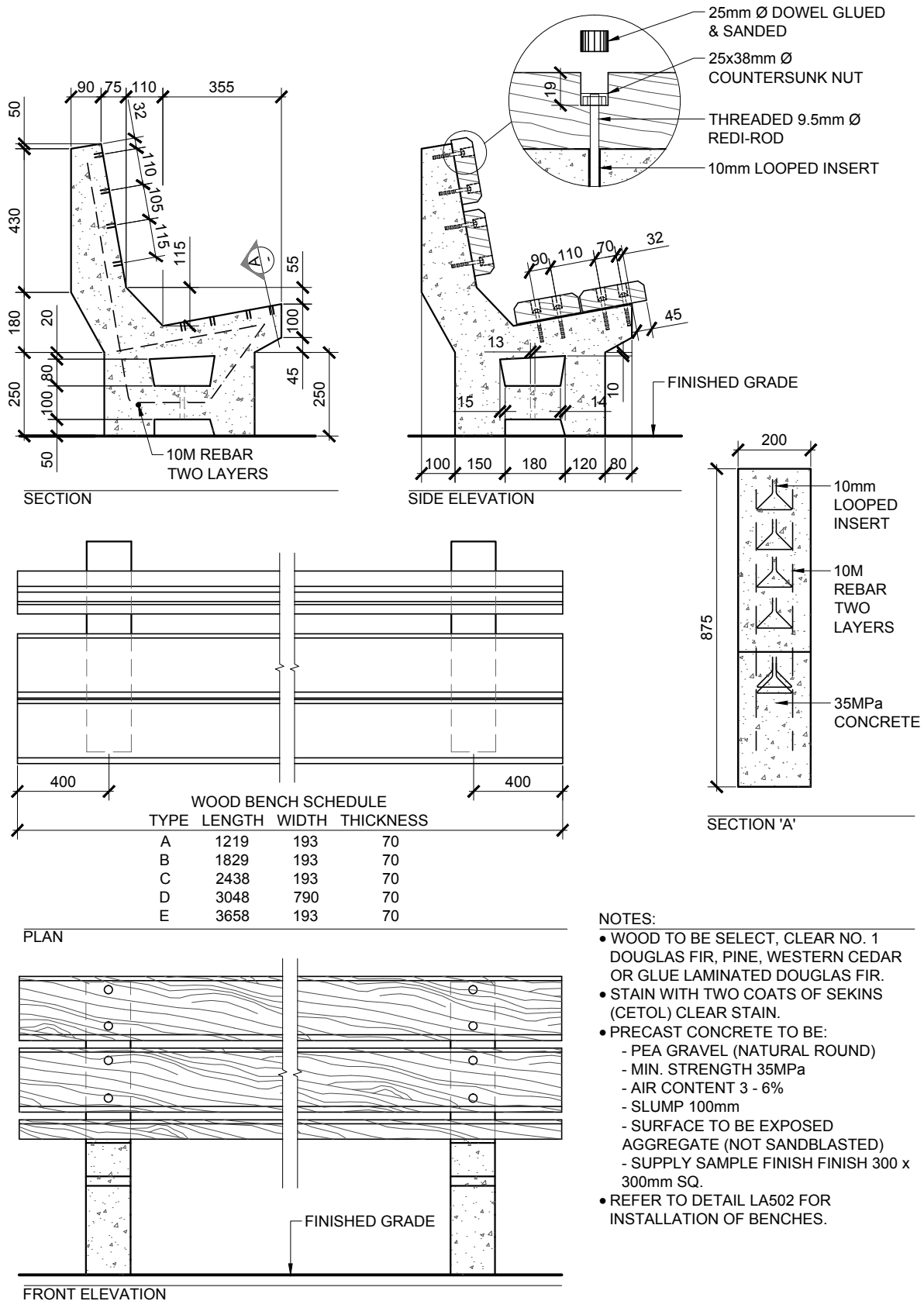
Old Drawing No.

9454



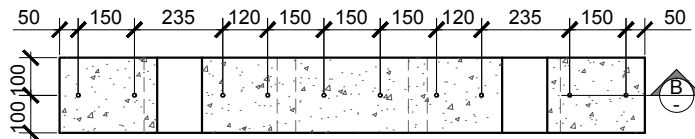
BARBED WIRE FOR CHAIN LINK FENCE DOUBLE GATE

| | | | | |
|-----------------------------|----------------------------------|--|----------|------------------------|
| 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 |

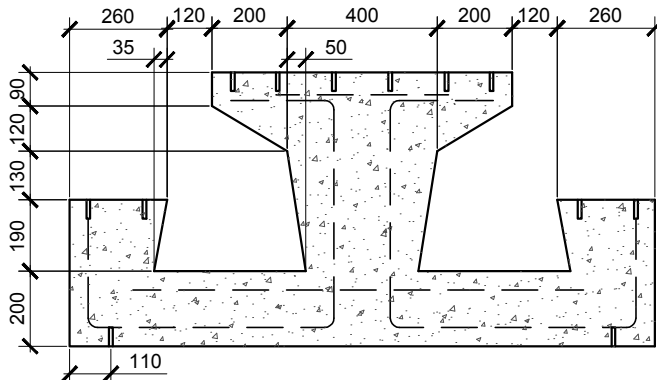


BENCH - WOOD & CONCRETE

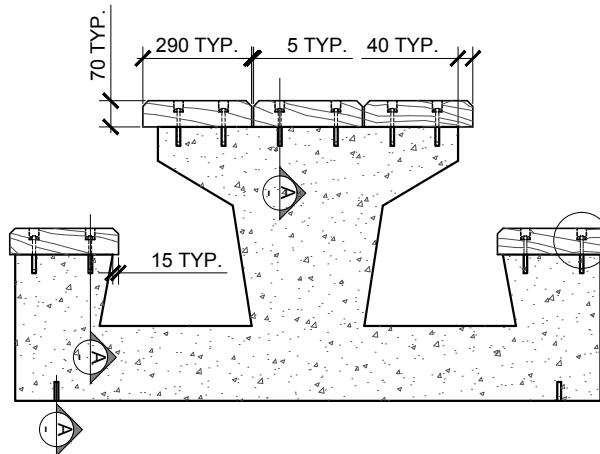
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|-----------------------------|----------------------------------|---------------|----------|--------------------------|
| Date Approved: SEPT 2013 | Drawn By: PARKS PLANNING | Approved: | Revision | Drawing No. LA500 |
| Scale: N.T.S. | Checked By: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



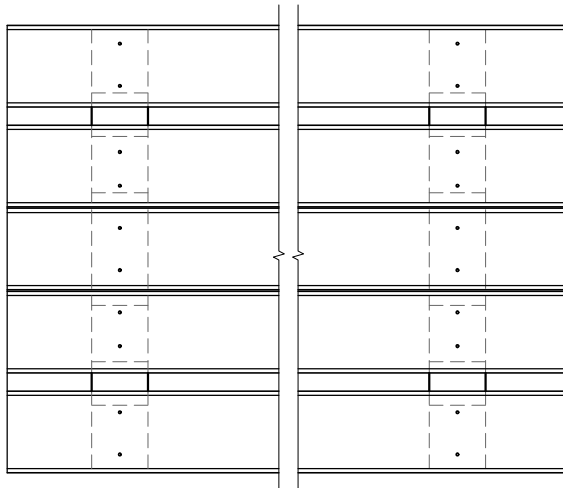
PLAN OF CONCRETE COMPONENT



SECTION 'B'



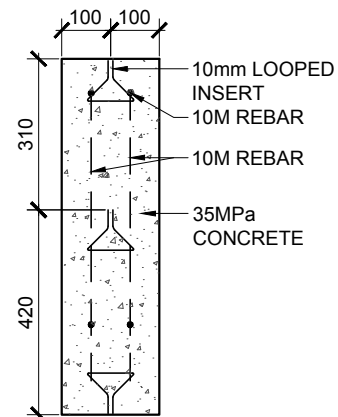
END ELEVATION



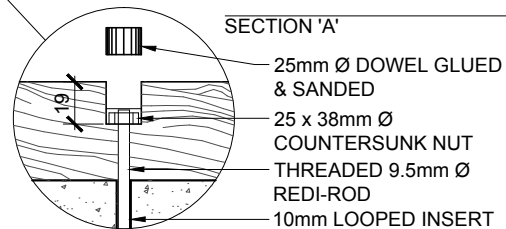
PLAN

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.



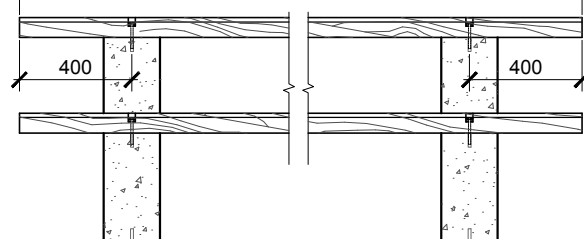
SECTION 'A'



WOOD TABLE SCHEDULE

TYPE LENGTH WIDTH THICKNESS

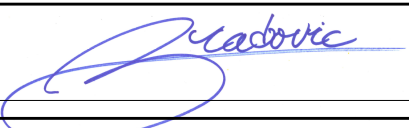
| | | | |
|---|------|-----|----|
| A | 1219 | 290 | 70 |
| B | 1829 | 290 | 70 |
| C | 2438 | 290 | 70 |



SIDE ELEVATION

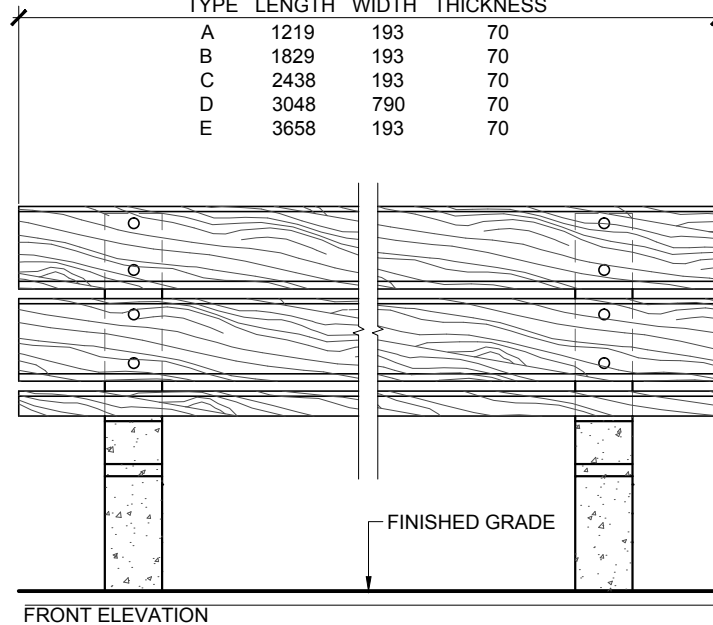


PICNIC TABLE - WOOD & CONCRETE

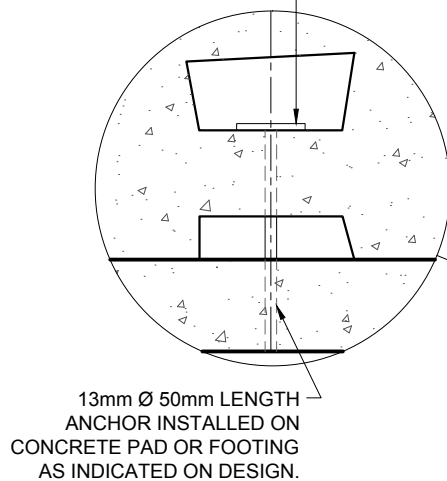
| | | | | |
|-----------------------------|----------------------------------|---|----------|--------------------------|
| Date Approved: SEPT 2013 | Drawn By: PARKS PLANNING | Approved:  | Revision | Drawing No. LA501 |
| Scale: N.T.S. | Checked By: PARKS PLANNING | | | Old Drawing No. SP428 |

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 |

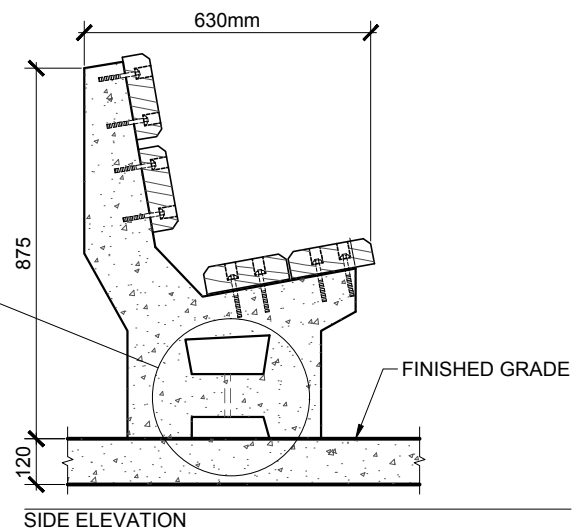


13mm THREADED ROD C/W
W49 FLAT WASHER & NUT.
ROD RIVETED @ END.



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

SIDE ELEVATION

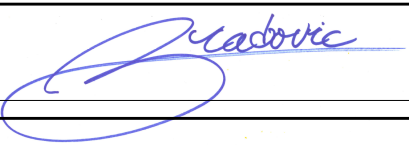


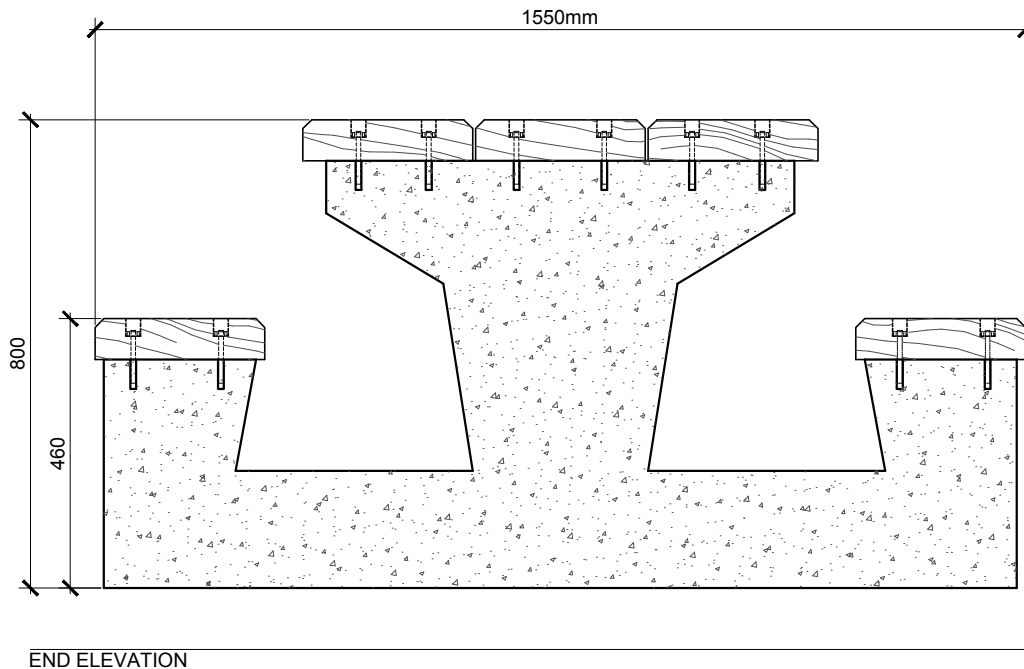
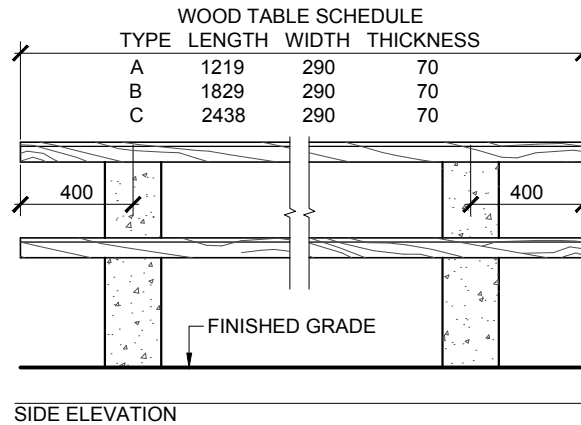
NOTES:

- 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 |

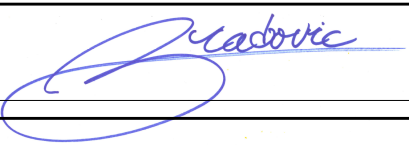


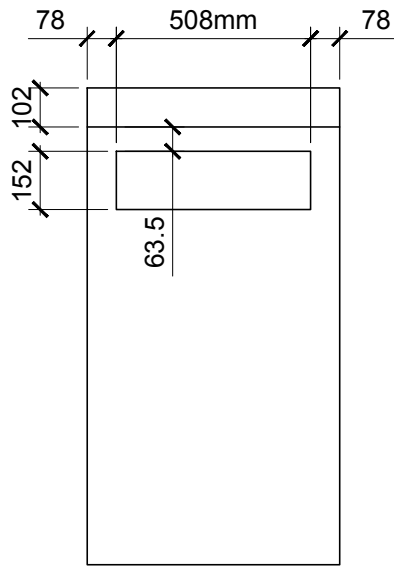
NOTES:

- 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.

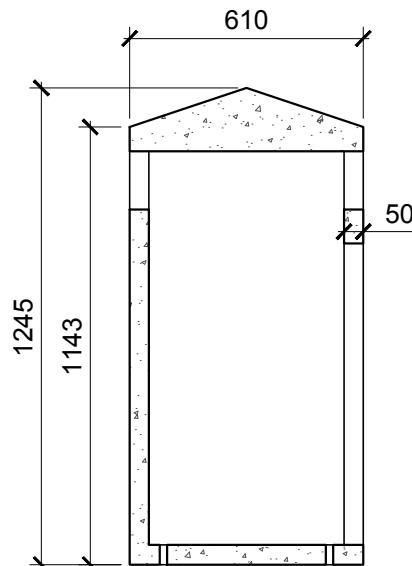


PICNIC TABLE - INSTALLATION

| | | | | |
|-----------------------------|----------------------------------|---|----------|--------------------------|
| 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 |

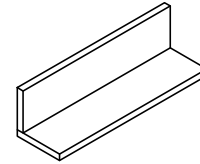


FRONT ELEVATION

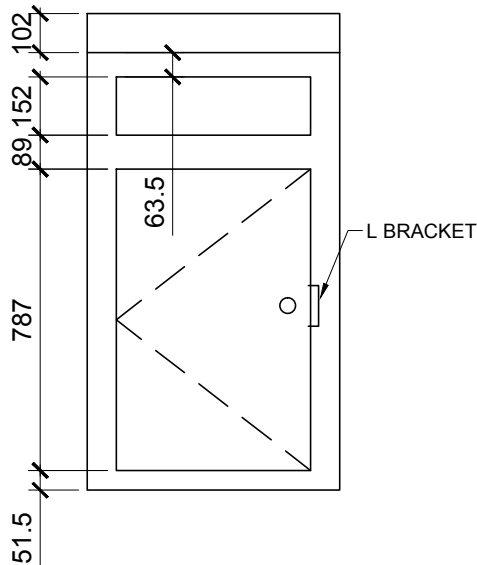


CROSS SECTION

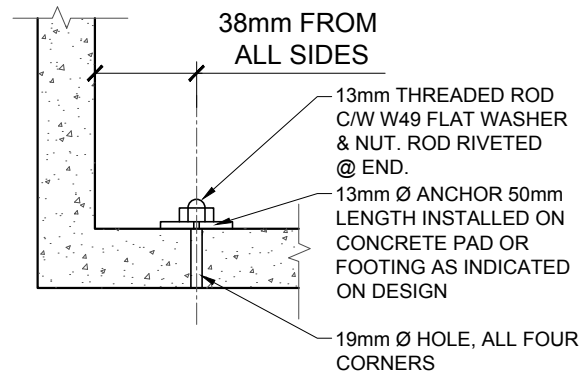
3mm THICK
25x25x100mm
LENGTH
L-BRACKET



L-BRACKET DETAIL



REAR ELEVATION



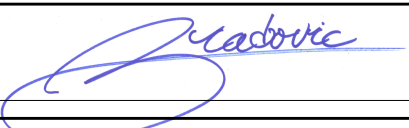
INSTALLATION DETAIL

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.

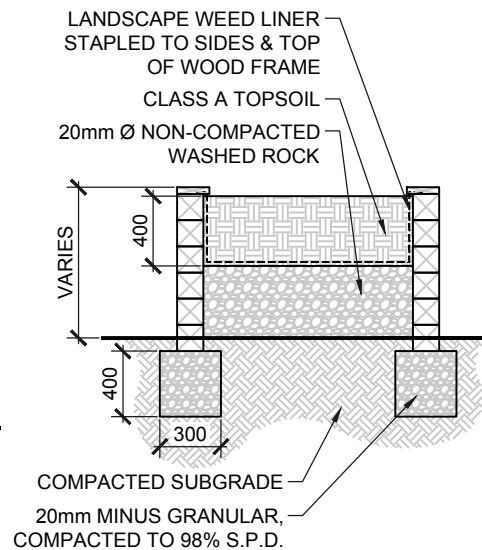
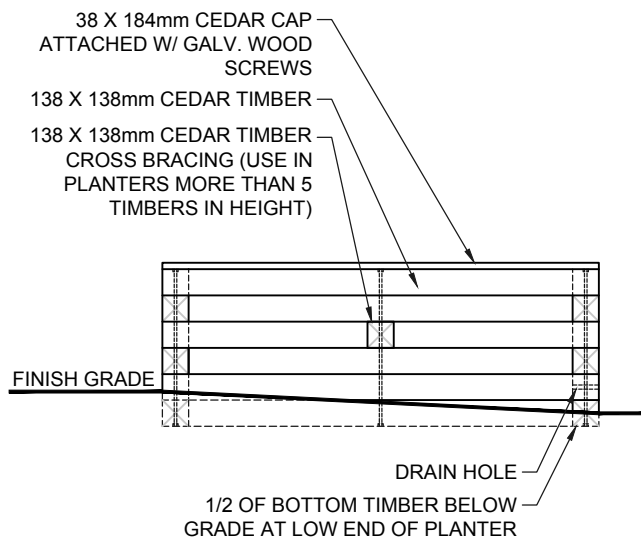
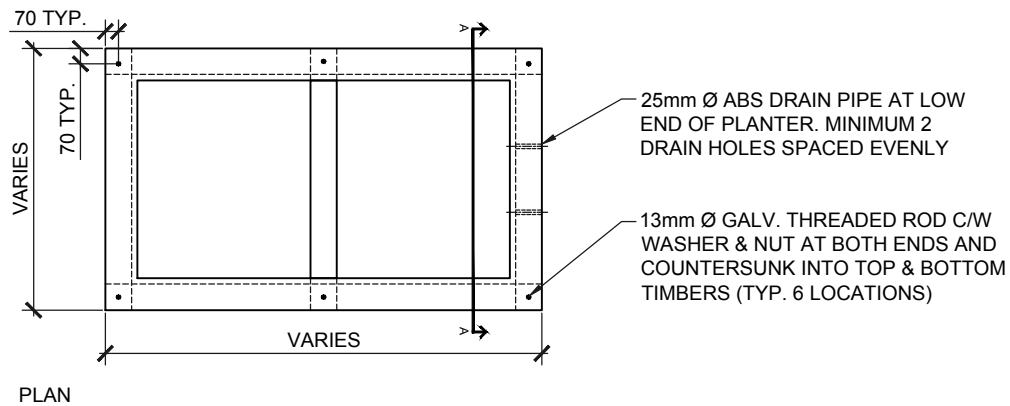


CONCRETE LITTER CONTAINER & INSTALLATION

| | | | | |
|-----------------------------|----------------------------------|---|----------|--------------------------|
| 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 |

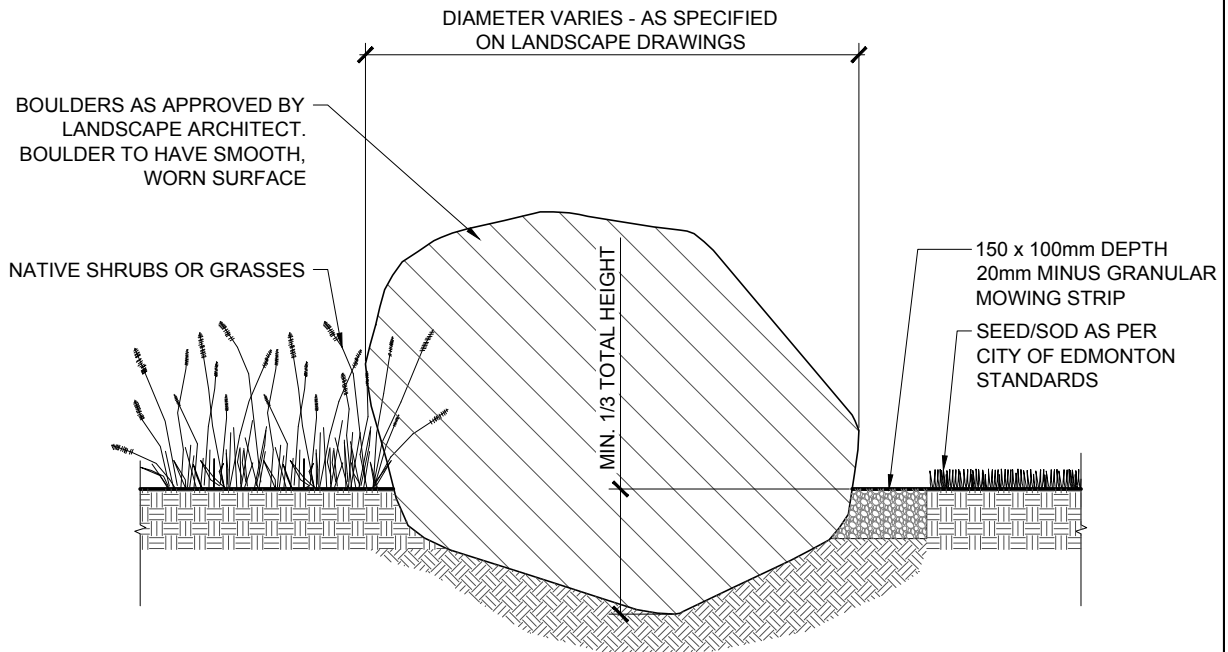
NOTES:

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



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

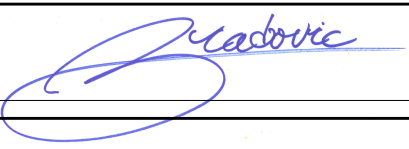
FORMAL/MAINTAINED INSTALLATION

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

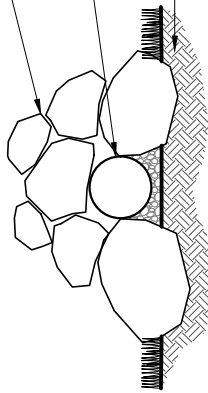
| | | | | |
|-----------------------------|----------------------------------|---|----------|----------------------|
| Date Approved: SEPT 2013 | Drawn By: PARKS PLANNING | Approved:  | Revision | Drawing No. LA600 |
| Scale: N.T.S. | Checked By: PARKS PLANNING | | | Old Drawing No. - |

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.

900mm MIN.

VARIES

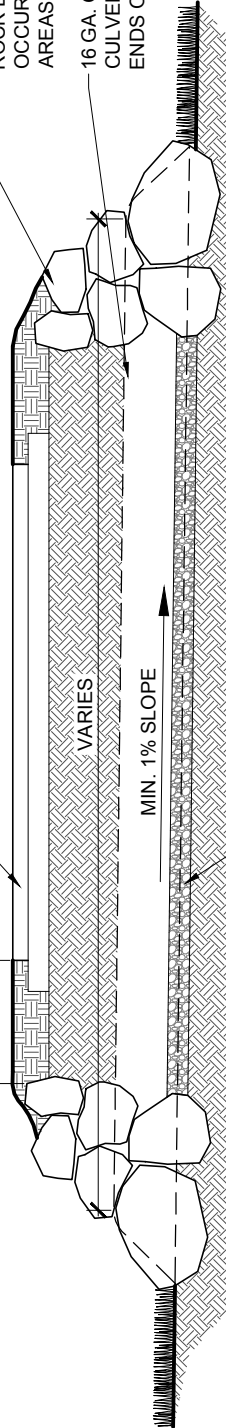
MIN. 1% SLOPE

100mm MINIMUM DEPTH OF 19mm
GRAVEL BENEATH CULVERT.

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

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

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



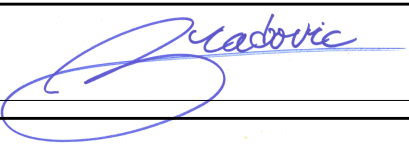
CROSS SECTION

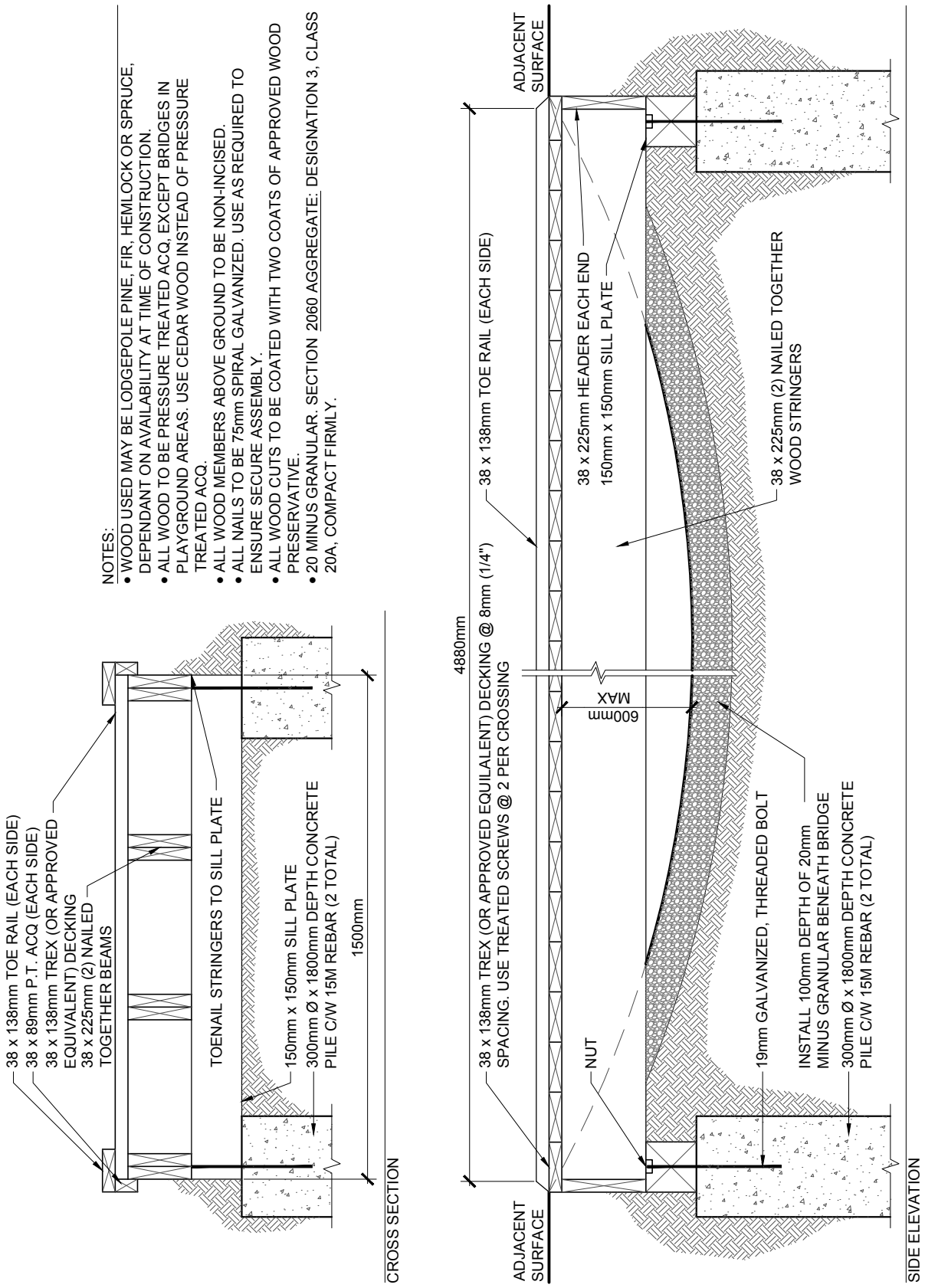
NOTES:

- SPECIFICATIONS: ALL COMPONENTS 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. - |



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 | June 2016 |
| 02870 | Site Furnishings | June 2016 |
| 02910 | Topsoil | June 2016 |
| 02914 | Mulches | June 2016 |
| 02918 | Colour Coding of T-Bar Tree Stakes | June 2016 |
| 02920 | Seed and Sod | June 2016 |
| 02930 | Trees, Shrubs and Ground Covers | June 2016 |
| 02931 | Naturalization | June 2016 |
| 04420 | Feature Boulders and Collected Stone | June 2016 |

1. GENERAL

1.1 SCOPE

Supply and installation of chain link fence

1.2 RELATED SECTIONS

Portland Cement Concrete Section 03055 Volume 2 Roadways

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)

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.

2.2 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/m ²) | 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 03055 - Portland 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, top rail and bottom tension wire 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.
- 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 reasonably 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 Waste/ Recycling Receptacle, two per Bench and two per Picnic Table.
- 2.1.4** All other fasteners and anchor bolts to be stainless steel to Type 304 (Grade 18-8).
- 2.1.5** Stain with "Sikkens Cetol #1" or City of Edmonton approved alternative. Shop application only.

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 will be stained with two coats of "Sikkens Cetol #1" or approved equal to manufacturer's specifications.
- 3.1.4** All end cuts to be dipped.
- 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 will be securely anchored with stainless hardware on site as specified on the approved landscape drawings and specifications.

END OF SECTION

1. GENERAL

1.1. SCOPE:

Preparing subgrade, place topsoil and inspections

1.2. RELATED SECTIONS:

Trees, Shrubs and Ground Covers Section 02930

1.3. DEFINITIONS

Weeds: Includes but not limited to dandelions, jimsonweed, quackgrass, 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.

2. PRODUCTS

2.1. CLASS B TOPSOIL FROM CITY SOURCE

Obtain from designated City stockpile; free of weeds.

2.2. TOPSOIL MIXTURES:

The following topsoil mixes are utilized by Community Services:

2.2.1. No. 1 Mix: 1 part Class B topsoil, 1 part sand, 1 part peat moss

2.2.2. Native Soil Mix: 1 part Class B topsoil, 1 part sand, 3 parts native soil or as directed by the City.

2.2.3. Peat Moss: Peat moss shall be horticultural quality, free of any foreign material, lumps, ice, clay, soil, stumps, rocks, quack grass and noxious weeds. Peat moss shall be pulverized and shall pass through a 33 mm screen. Peat moss when tested by an accredited testing laboratory shall meet with the following limits:

| | |
|-----------------------|-----------------|
| Soil reaction (pH) | 4.5 - 6.0 |
| Conductivity (mm hos) | maximum 2.0 |
| Sulphates max. | 200 maximum ppm |
| Free of lime | Nil |

Nitrogen, phosphorous and potassium will be evaluated on available nutrients.

- 2.2.4. Sand for horticulture use:** When tested by means of laboratory sieves, the sand shall meet the following grading requirements and be uniformly graded between the limits given:

| <u>Passing</u> | <u>Cumulative % by Weight</u> |
|--------------------|-------------------------------|
| 2.5 mm (No. 8) | 100 |
| 1.25 mm (No. 16) | 90 - 100 |
| 0.8 mm (No. 20) | 80 - 90 |
| 0.315 mm (No. 50) | 30 - 60 |
| 0.16 mm (No. 100) | 10-Feb |
| 0.063 mm (No. 200) | 1% maximum |

Sand shall be natural and coarse, except for the removal of very fine particles and gravel, and conform to the above specifications. Sand shall be free from vegetation, clay balls, or other extraneous material. Reasonable care in the selection of material in a pit shall be used to produce a uniform product.

- 2.2.5. Lime:** Dry, free-flowing, ground limestone containing not less than 85% of total combined carbonates, to the following gradation:

| <u>Sieve Size (mm)</u> | <u>Minimum % Passing, by Mass</u> |
|------------------------|-----------------------------------|
| 800 | 90 |
| 160 | 50 |

2.3. TEXTURAL CLASSES FOR TOPSOIL (LOAMS)

Topsoil shall fall within an allowance of Sand $\pm 5\%$, Silt $\pm 10\%$ and Clay $\pm 10\%$, of the values stated in the table below.

| Soil | <u>Sand (%)</u> | <u>Silt (%)</u> | <u>Clay (%)</u> | <u>Class</u> |
|----------------------------|-----------------|-----------------|-----------------|--------------|
| 1. Topsoil A | 60 | 30 | 10 | Sandy Loam |
| 2. Topsoil B (Recommended) | 35 | 35 | 30 | Loam |
| 3. Topsoil C | 25 | 40 | 35 | Clay Loam |

2.4. ANALYSIS

Testing and inspection of imported topsoil from non-approved City sources:

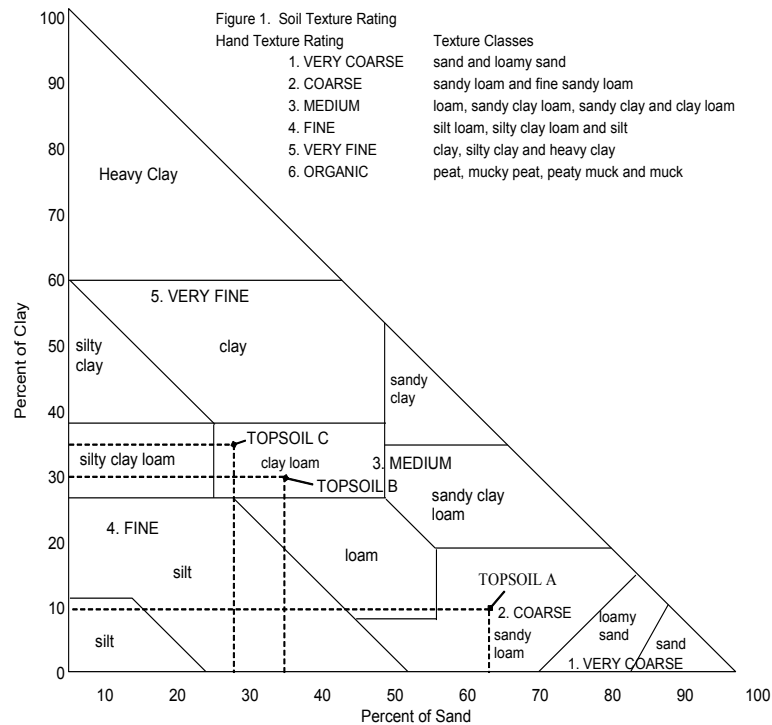
- 2.4.1. The Contractor shall submit representative samples of the topsoil to be used for the intended project to a professional Agrologist for analysis and recommendations. A copy of the report shall be submitted to the City for approval.
- 2.4.2. The City shall provide written approval to the contractor.
- 2.4.3. The soil analysis report will include the topsoil source and the recommendations for correction to meet the nutritional growing requirements of specified plant materials. Recommendations will clearly state the type and quantity of soil additives and application procedure to be used. Only accredited testing companies accepted by the City of Edmonton's Quality Assurance Services will be retained.
- 2.4.4. Topsoil analysis to be submitted to the City prior to construction. Such analysis shall be performed on representative samples from each topsoil source and shall determine nitrogen, phosphorus, potash, soluble salt content, electrical conductivity, pH value and percentage sodium absorption ratio values of sand, clay and organic matter, conforming to the following:

RECOMMENDED SOIL COMPOSITION:

| | |
|-----------------------------|---------------------------------|
| Sand: | 35% ($\pm 5\%$) by dry mass |
| Clay: | 30% ($\pm 10\%$) by dry mass* |
| Silt: | 35% ($\pm 10\%$) by dry mass* |
| Organic Matter: | 5% - 10% by dry mass |
| Toxic Chemicals: | None |
| Electrical Conductivity: | Maximum 1.5 dS/m |
| pH Value (saturated paste): | 6.0 to 7.5 |
| Sodium Absorption | less than 6 |

Note: All soils must fall within the Clay Loam Classification

*Note: Total fine grain component (silt and clay) must not exceed 65%

2.4.5. Soil Texture**2.5. EQUIPMENT**

2.5.1. Cultivators capable of scarifying, discing or harrowing.

2.5.2. Rollers of suitable size and mass and any other equipment the City may determine necessary to complete the topsoil installation.

3. EXECUTION**3.1. DELIVERY STORAGE AND HANDLING**

3.1.1. If topsoil is to be stockpiled on public lands, locations must be designated by the City.

3.1.2. When loading topsoil from a designated City stockpile, do not leave a vertical face.

3.1.3. No soil stockpiling by the Contractor on future Municipal Reserve lands unless written permission is granted by the Director, Project Development, Community Services. Such permission will not be unreasonably withheld.

3.2. PLACING TOPSOIL

3.2.1. The City shall approve the subgrade prior to placing topsoil and approve finished grade before the Contractor proceeds with the next phase of work.

3.2.2. 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.

3.2.3. Spread topsoil uniformly on prepared subsoil to achieve a minimum compacted or settled depth of 100 mm for sodded areas and 150 mm for seeded areas unless otherwise stated.

- 3.2.4.** Cultivate topsoil to a depth of 75mm, breaking down lumps. Remove stones larger than 50 mm, weeds, roots and other foreign matter.
- 3.2.5.** Manually spread topsoil around trees and plants to prevent damage by grading and levelling equipment.
- 3.2.6.** Float the area until surface is smooth. Cut smooth and flush areas adjacent to catch basin rims. Remove all lumps, rocks, roots and other debris from the finished material and from the site.
- 3.2.7.** Fine grade to eliminate rough or low areas and to ensure positive drainage.
- 3.2.8.** Compact topsoil with suitable rollers to the satisfaction of the City.
- 3.2.9.** Final topsoil grades for seeded areas shall be flush to finished grade at surface structures, i.e. manholes, sidewalks and curbs.
- 3.2.10.** 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 turfed area.
- 3.2.11.** 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.
- 3.2.12.** The City shall approve topsoil preparation prior to seeding or sodding.

3.3. CLEAN-UP

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.

END OF SECTION

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.** Include statement that 100 mm depth of deciduous wood chip mulch must be maintained to edge of planting bed.
- 3.1.2.** All mulches to be installed during active growing season. Water plants prior to applying mulch.
- 3.1.3.** 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. SPREADING

- 3.3.1.** Apply bark chip mulch in a 50 mm to 100 mm maximum layer in special areas as per drawings.
- 3.3.2.** Apply coniferous wood chip mulch in acid tolerant planting beds to a minimum depth of 100 mm, except around tree trunks where chips are to be pulled back, leaving only a 25 mm depth.
- 3.3.3.** Apply deciduous wood chip mulch to a minimum depth of 100 mm.
- 3.3.4.** Apply softwood lumber chips in maximum layers of 50 mm to 100 mm.

3.4. 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.

3.5. 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 Community Services.

| 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.

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 Milkvech (*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);
- 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*);
7.5% Tufted Hair Grass (*Deschampsia caespitosa*);
7.5% 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. Mesh must be removed prior to installation on big roll sod on sports fields.

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 3 horizontal to 1 vertical or steeper with Parks Naturalization Mix as in Clause **Error! Reference source not found.**. In other latter areas use Canada #1 Mix as in Clause 0. 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.** Handle sod carefully when loading and installing to prevent tearing or breaking.

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

- 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.
- 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.

3.8. SODDING ON SLOPES 3 HORIZONTAL TO 1 VERTICAL OR STEEPER

If sodding occurs on any slope steeper than 3 Horizontal to 1 Vertical, sod may be pegged, 25 per 10 m², with short wooden pegs to prevent sod from slipping. Pegs to be pounded flush with ground.

3.9. WARRANTY

- 3.9.1.** All grass either seeded or sodded shall have a one-year warranty period from issuance of the Construction Completion Certificate.
- 3.9.2.** Areas showing deterioration, bare spots or thin areas shall be re-seeded or re-sodded at the Contractor's expense.

3.10. MAINTENANCE

3.10.1. 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.

3.11. FINAL INSPECTION

3.11.1. Final inspection of seeded or sodded areas will be made prior to the end of the warranty period.

3.11.2. At the time of inspection all the areas shall be alive and in a healthy satisfactory growing condition and free from weeds.

3.12. CLEAN-UP

3.12.1. 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. GENERAL**1.1 SCOPE**

Supplying trees, shrubs, ground covers, fertilizing, watering, mulching, staking, maintenance and inspection.

1.2 RELATED SECTIONS

Topsoil Section 02910

1.3 EXAMINATION

- 1.3.1** Report to the City, in writing, any conditions or defects encountered on the site during construction upon which the work of this section depends and which may adversely affect its performance.
- 1.3.2** Do not commence work until such conditions or defects have been investigated and corrected.
- 1.3.3** Commencement of work shall imply acceptance of surfaces and conditions and no claims for damages or extras resulting from such conditions or defects will be accepted thereafter, except in cases where such conditions cannot be known prior to or during the course of construction.

1.4 PRODUCT DELIVERY HANDLING AND STORAGE

- 1.4.1** Supply manufactured items such as fertilizer and mulch, in standard containers, clearly indicating contents, weight, component analysis and the name of the manufacturer.
- 1.4.2** Store manufactured materials subject to deterioration, in a weatherproof place on site and in such a manner that their effectiveness is not impaired.
- 1.4.3** Supply plant material as specified on the plant list outlined on the approved landscape drawings.
- 1.4.4** Handle plant material with reasonable care and skill to prevent injuries to trunk, branches, roots, rootballs and containers.
- 1.4.5** Protect plants during shipment with tarpaulin or other suitable covering and carefully tie in all branches before transporting, to prevent excessive drying from sun and wind or breakage from wind and equipment. Pad all points of contact between plant material and equipment.
- 1.4.6** For trees dug by tree spade the root ball shall be placed in burlap and a wire basket. Wire basket shall be laced at the top and of sufficient strength to withstand lifting the tree by the top loops of the basket at a minimum of two points.
- 1.4.7** Trees (in foliage) that are moved by the Basket Method or Balled and Burlapped Method; the foliage and root ball must be covered by a tarp.
- 1.4.8** Container stock should be handled as much as possible by the pot only, in order to reduce breakage.
- 1.4.9** All plants should be unloaded and checked immediately upon arrival and should be watered as required. Trees with cracked or broken root balls will not be accepted.

- 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 request 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

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. The consultant must request inspection with Forestry five business days prior to tree root trenching. A Forestry delegate must inspect the trenching process prior to completion of the trenching project with approved top soil.

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 and vigorous and 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 Annual 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

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; Section 2.

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 300 mm. Reference detail 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 Cut back weed liner, if provided, at each tree and shrub location with three cuts at 120 degrees from the centre of the proposed plant. Ensure weed liner is cut back sufficiently to accommodate excavation of root zone for tree or shrub. Excavate tree and shrub root holes as per standard planting details and install plant material.

3.5.6 Construct watering swales using topsoil from around the base of the plant and roll back the weed liner. 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.

3.5.7 Install optional landscape edgers around perimeter of planting shrub beds. Landscape edging to be a maximum 12 mm higher than existing surrounding grades. Ensure weed liner, if provided, is rolled down the interior face of the landscape edging a minimum of 100 mm

- 3.5.8** Install 100 mm of wood mulch as specified by landscape drawings. Finished grade of mulch to match adjacent turf grades or top of landscaping edging upon final settlement. Reference detail LA108.

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 shall have a minimum of 300 mm of class B topsoil surrounding the sides of the root ball. Reference details LA102 – LA113.
- 3.6.3** All shrubs shall have 150 mm of specified topsoil surrounding the sides of the containerized roots or exposed bare roots. Reference details LA108 – LA110.
- 3.6.4** 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.
- 3.6.5** 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 details LA104 – LA105. Soil glazing from the tree spade shovels must be scarified.
- 3.6.6** 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.
- 3.6.7** Trees and shrubs shall be faced to give the best appearance or relationship to adjacent structures, walkways or park features.
- 3.6.8** 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.
- 3.6.9** 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 B & B 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.
- 3.6.10** 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.
- 3.6.11** 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.
- 3.6.12** The planting topsoil shall not be placed while frozen or muddy.
- 3.6.13** Add 100 mm of wood chip mulch over exposed portion of tree root ball and extend mulch 150 mm beyond edge of root hole. Reference details LA102 – LA113.

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 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** Newly planted trees may require the application of a completely water-soluble high phosphorous fertilizer e.g. 10-52-10. No fertilizer should be applied during 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 Community Services Department.
- 3.9.10** 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.
- 3.9.11** 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.

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 details LA102 – LA113.

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 Community Services 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 Community Services 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 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 4.8.3 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 Tree Policy C456A.

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; |
| Mulches | Section 02914; |
| Seed and Sod | Section 02920; |
| Trees, Shrubs and Groundcovers | Section 02930; |

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 regarding supply and handling of mulches.

1.3.3 Refer to Section 02920 regarding supply and handling of seed.

1.3.4 Refer to Section 02930 regarding supply and handling of plant material.

1.4 DEFINITIONS

Natural Appearing: appears non man made.

Native Material: plants and grasses native to the area. In certain cases, plants similar to or related to truly native species may be accepted.

Naturalization: the creation of a self sustaining native plant community, generally with the intent of creating a natural appearing installation while minimizing installation and on going maintenance costs.

Planting Bed Naturalization: construction of an excavated and topsoiled shrub bed reference detail LA110-LA111. A more expensive alternative suitable where larger material is specified to achieve a more immediate effect and less plant loss is desired and on barren sites where there are no existing organic soils, plants or grasses that might be retained.

Individual Plant Naturalization: excavation of individual pits for each plant. A less expensive alternative suitable for locations where there are existing soils, plant materials and/or grasses that may be retained to lessen disruption.

Plant Mats: excavated mats of native material containing plants, roots and related soil.

Live Soil: soils containing native plant material roots.

Custom Installations: dependent on site conditions and with the approval of the Director/Parks, other installation techniques may be considered.

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 the Director/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

Utilize Class 'B' topsoil as per Section 02910 – TOPSOIL, SUBGRADE PREPARATION. Amend as required through the addition of compost.

2.3 CONIFEROUS SHREDDED BARK MULCH

Coniferous shredded bark mulch as per Section 02914 - MULCHES is the preferred mulch.

2.4 DECIDUOUS WOOD CHIP MULCH

2.4.1 Deciduous wood chip mulch as produced by the City of Edmonton from pruned or removed trees may be used after FAC for topping up the mulch, if required.

2.4.2 Mulching of naturalization areas is generally not desired after establishment.

3. EXECUTION

3.1 SHRUB BED NATURALIZATION

3.1.1 Construct a typical planting bed and install plant material as per Section 02930 - TREES, SHRUBS AND GROUNDCOVERS. For larger material install in individual pits in the planting bed reference details LA102 – LA113.

3.1.2 Space all material to ensure a full coverage.

3.2 INDIVIDUAL PLANT NATURALIZATION

3.2.1 Reference detail LA110-LA111.

3.2.2 Remove surface debris that might inhibit planting.

3.2.3 Remove grass from area to be planted by killing grasses over entire area with an approved spray or mechanically by removing grass over individual pits for each tree/shrub.

3.2.4 Construct individual pits for each plant as detailed.

3.2.5 For larger material install in individual pits reference details LA102 – LA113.

3.2.6 Space all material to ensure a full coverage.

3.3 LIVE SOIL

Gather live soil and transport to site ensuring material is kept moist. Spread live soil to a minimum 150mm depth over the existing ground. Water thoroughly.

3.4 PLANT MATS

- 3.4.1** Excavate a 300mm depth pit and install 150mm depth of moderately compacted Class 'B' topsoil.
- 3.4.2** Excavate a plant mat from the source site and transport to the site minimizing breakup of the mat and ensuring material remains moist.
- 3.4.3** Install the mat on the topsoil and cover all exposed edges with moderately compacted topsoil, ensuring stability of mats. Water thoroughly.

3.5 MULCHES

- 3.5.1** Apply mulch to 100mm settled depth. Neither a weed barrier blanket or an edger are required.

3.6 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.

3.7 MAINTENANCE

- 3.7.1** Refer to Specification 02930 TREES, SHRUBS AND GROUNDCOVERS for weed free requirements at inspection points, throughout the warranty period and thereafter.
- 3.7.2** 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.
- 3.7.3** During the period between CCC and FAC inspections, the installer is to top up mulch applications to retain minimum required depth.
- 3.7.4** After FAC acceptance, the City of Edmonton will be responsible for maintaining mulch applications to the specified depth and quality. Over time, as plants mature and grow together, the mulch requirement is to be phased out.

END OF SECTION

1. GENERAL**1.1. SCOPE**

Supply and installation of collected stone and feature boulders.

1.2. RELATED SECTIONS

| | | |
|-----------------------|---------------|-------------------|
| Grading | Section 02310 | Volume 2 Roadways |
| Clearing and Grubbing | Section 02231 | Volume 2 Roadways |

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 detail LA600.
- 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