



Design and Construction Standards

Volume 1 General

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DESIGN AND CONSTRUCTION STANDARDS

VOLUME 1

GENERAL

CHAPTER 1 - INTENT AND USE OF THE DESIGN STANDARDS

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GENERAL PROVISIONS FOR DEVELOPERS

CONSTRUCTION SPECIFICATIONS

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1. APPLICATION OF THESE DESIGN STANDARDS

This document has been prepared to guide the designer employed on behalf of the development industry in the design of municipal improvements and systems that will meet the requirements of the City of Edmonton. It is intended to fulfil the following needs:

- 1.1 To encourage conformance of development and servicing proposals to the land development approval process and the applicable statutory, engineering and administrative requirements as projects progress from planning through concept and design stages. These processes and requirements are in place to ensure that Developers provide municipal improvements and systems that are acceptable to the City for operation and maintenance.
- 1.2 To provide a consolidated statement of City policies and expectations regarding the standard of municipal improvements required.
- 1.3 To promote consistency and quality in the standard of municipal improvements provided throughout the City.
- 1.4 To ensure that the municipal improvements and systems as designed will be robust and perform reliably in all circumstances and upon acceptance by the City, subject the public to normal, reasonable and tolerable responsibilities and costs for maintenance and operation.
- 1.5 To identify those design criteria that the City considers to be the minimum standards acceptable for typical conditions.
- 1.6 To identify the City's preference and requirements when there are alternative technical options available to address a particular servicing issue.
- 1.7 To outline for Developers and Consultants the various stages of system planning and design, levels of analyses required and procedures to be followed to obtain approval of conceptual, preliminary and detail design for their municipal improvement proposals.

2. DEFINITIONS AND INTERPRETATION OF TERMS

For the purposes of interpretation of the Design Standards the following definitions shall apply:

- 2.1 The **City** may refer to, as appropriate to the context, the City of Edmonton as a corporate body, or a City owned corporation. Throughout this document, references to City department may refer to or include, where applicable, a City owned corporation.
- 2.2 The **Consultant** refers to the professional engineer responsible for the preparation of designs, reports, studies, engineering drawings and associated documents and for the execution and implementation of such designs, normally on behalf of a Developer. The Consultant must hold a valid permit to practice within the Province of Alberta and be registered as an Engineer in good standing with APEGGA.
- 2.3 The **Developer** refers to the proponent of a land development proposal, or the Owner as defined in a Servicing Agreement. Requirements of the Developer stated in these standards may, where appropriate, be referred to a consultant, contractor or other agent acting on the Developer's behalf.
- 2.4 The **Engineer** refers to the professional engineer authorized by the City department to review and approve design submissions, reports, proposals and engineering drawings in relation to land development servicing proposals and designs of municipal improvements under the terms of Servicing Agreements between the City and a Developer.

- 2.5 The **Landscape Architect** refers to the consultant acting normally on behalf of the Developer to coordinate the preparation of all landscape drawings, inspect all on site work and coordinate with Parks Branch, Asset Management & Public Works Department the issuance of construction completion certificates (C.C.C.s) and final acceptance certificates (F.A.C.s). The Landscape Architect must be a member in good standing of the Alberta Association of Landscape Architects.
- 2.6 The **Servicing Agreement** refers to a legal agreement between Developers and the City which specifies the financial obligations and the terms and conditions for the construction and warranty of municipal improvements necessary to service lands approved for development.
- Servicing Agreement
 - Municipal Improvement Servicing Agreement
 - Municipal Improvement Agreement
- 2.7 The **Engineering Drawings** are the plans that set out the scope and detail of the municipal improvements to be provided by the Developer under the terms of the Servicing Agreement and shall refer to or include, where applicable, landscape drawings. The Engineering Drawings must be assembled under cover of a Consultant eligible to practice engineering within the Province of Alberta and registered with APEGGA.

3. USE OF THESE DESIGN STANDARDS

- 3.1 These standards set out the minimum requirements to be satisfied in the planning and design of municipal improvements within the City of Edmonton. The standards are to be utilized as a reference document for planners, designers and engineers engaged in work in the City, or preparation of engineering drawings and associated reports that will be subject to the approval of the City.
- 3.2 The performance standards and the detailed requirements defined in these standards shall apply to the preparation of engineering drawings and the execution of projects by Developers under the terms of Servicing Agreements with the City.
- 3.3 These standards shall not be considered a rigid requirement and Consultants are encouraged to continuously seek new and better solutions. Where a variation to the standards could achieve a better technical and economical result a proposal should be presented for approval.
- 3.4 When using these standards and specifications, the Developer and the Consultant remain fully responsible for the design and construction of municipal improvements according to good engineering standards that address the specific needs and site conditions of their project. Without limiting that broad and general obligation, these standards and specifications shall be the minimum requirement. The Consultant must be satisfied of the applicability of the design criteria in these standards to the project at hand and apply more stringent criteria where appropriate.
- 3.5 The Engineer's approval covers only compliance with these standards and is not a warranty of the design of the work. Further, the City expressly disclaims any responsibility for the suitability of the drawings or the designs to a particular site but requires the Consultant to assume full responsibility in this regard.

4. CHANGES FROM THE DESIGN STANDARDS AND ITEMS NOT COVERED

4.1 Revision of Standards by the Engineer

These standards have been established based on an assessment of current and future needs and the knowledge available to the date of their preparation. The City recognises that many of the criteria and design parameters contained in the standards may require review and re-evaluation over time based on new or improved knowledge. The City will monitor and evaluate the performance of existing municipal improvements and systems and this may identify the need to revise the content of this document. Certain issues relating to municipal improvement requirements are not addressed within

these standards and further innovations in design may identify the need for new standards. While these situations may often be addressed on a case by case basis through the application of good engineering practice, establishment of new standards may be necessary to ensure that the issues are addressed consistently for future applications. In consideration of these needs, the Engineer reserves the right to alter or revise the standards from time to time. Incorporation of such revisions into the standards will be co-ordinated through the Office of Development Coordination, Planning and Development Department, providing reasonable notice to the development industry.

4.2 Proposals from the Developer

- 4.2.1 If the Developer wishes to apply methods which differ from a standard or specification in this document, or if these standards or specifications do not cover a subject of concern to a specific design, or if the Developer proposes to use materials not approved in this document, then the responsibility shall be upon the Developer to justify the proposal or resolve the concern to the satisfaction of the City. The concern shall be the subject of a report that the Developer shall have prepared by a professional engineer and signed, sealed and submitted to the City for review.
- 4.2.2 The report shall present the alternatives for resolution of the concern and shall make a recommendation on the proposed standard or material to be used, with justifications in terms of implementation feasibility and economic, engineering, environmental, operational and maintenance criteria.
- 4.2.3 Notwithstanding the review of this report by the Engineer and the acceptance by the Engineer of the alternatives recommended in the report, the Developer and the Consultant remain fully responsible for the design and construction of the municipal improvements according to good engineering practice adequate to address the specific needs and site conditions.

5. FINAL DECISION ON DESIGN STANDARDS

The City reserves the right to the final decision regarding the interpretation of the intent of these standards and the acceptability of changes from the standards proposed by the Developer. Interpretations and approvals will be given by the Engineer or the Engineer's authorized representative as defined in the Servicing Agreement. If deemed necessary, the Engineer may revise or amend the requirements. Such interpretations and approvals shall represent the Engineer's concurrence with the design basis and performance targets associated with the design and shall not be interpreted as a warranty as to the accuracy or completeness of design reports and engineering drawings. This remains the responsibility of the professional engineers authoring the documents. The City shall remain flexible and open-minded to new or innovative standards provided that they do not compromise public safety and present a net benefit to the public.

6. STATUTORY REQUIREMENTS FOR APPROVALS BY OTHER AUTHORITIES

- 6.1 It shall be a responsibility of the Consultant undertaking a development project to be aware of the statutory requirements governing such works and for compliance with those requirements. The Consultant shall obtain or arrange for all approvals from the authorities having jurisdiction.
- 6.2 Where these standards refer to bylaws, acts, regulations and standards, this shall mean the most recent edition or amendment of the referenced document.
- 6.3 Where due to amendment of statutory requirements, conflicts or inconsistencies with this standard arise, the Consultant shall be responsible for satisfaction of the more stringent requirement and shall notify the Engineer of the issue.

7. GUIDELINES TO ENGINEERING DRAWING SUBMISSIONS

7.1 Prerequisites to Review of Engineering Drawings

Engineering drawings for a proposed subdivision may not be accepted for review in the absence of the required design studies and reports and approval of a plan of subdivision by the Subdivision Authority for the City of Edmonton.

7.2 Engineering Drawing Submission and Approval Procedure

- 7.2.1 The Developer shall submit to the Office of Development Coordination, Planning and Development Department, copies of complete engineering drawings prepared by a registered professional engineer, indicating all data that is relevant to the proposed municipal improvements. Drawing submissions shall include landscape drawings, where applicable, prepared by a Landscape Architect. All engineering drawings shall be subject to the approval of the City. Incomplete submissions will not be accepted and circulated for review and approval.
- 7.2.2 The Developer shall submit such engineering drawings a minimum of 3 months before the proposed initial date of construction, subject to 7.2.3.
- 7.2.3 Should the Engineer not approve the Developer's engineering drawings or proposals, these will be returned to the Consultant with comments for revision by the Consultant to the satisfaction of the Engineer. The period from the return of the engineering drawings to the re-submission of the revised Drawings or proposals shall be deemed to be additional to that specified in the preceding paragraph. The time period for review by the City will be increased as a direct result of excessive number of cycles of review and comment as required.
- 7.2.4 All detailed engineering drawings must be approved as required by the following City departments and other utility agencies, with Planning and Development having final approval signature on all drawings:
- Drainage Services, Asset Management and Public Works
 - EPCOR Water Services
 - Development Engineering, Transportation
 - EPCOR Distribution and Transmission (underground power and landscape drawings only)
 - Transportation Operations, Transportation (street identifications and traffic signs, pavement markings, signals and street lighting drawings only)
 - Parks Branch, Asset Management & Public Works (landscape drawings only)
 - Office of Development Coordination, Planning and Development (Final Approval)
- 7.2.5 The Developer shall not proceed with construction until the Engineer has approved the engineering drawings and the City has executed a Servicing Agreement for the development.
- 7.2.6 Some City departments may require the submission of engineering drawings in an acceptable electronic format after approval.

7.3 Arterial Road Preliminary Design Plan Requirements

- 7.3.1 An arterial concept plan must be approved by the Transportation Department prior to proceeding with a preliminary design plan. The concept plan should be 1:1000 scale and must outline the turning movements, number of lanes, access locations, and right-of-way limits. The limits of a concept plan must extend from arterial road to arterial road.
- 7.3.2 The primary purposes of the preliminary plan are to establish the staging with respect to the existing and ultimate plan; provide a plan that minimizes removals when future stages are constructed; and identify potential conflicts with other improvements or utilities.
- 7.3.3 The Developer shall submit arterial road preliminary design plans (six copies required for first submission) for review and approval by the Transportation Department when a development involves improvements on an existing and/or a proposed arterial road. Approval of such plans is required prior to the submission of detailed Engineering Drawings.
- 7.3.4 Preliminary plans shall be drawn to a scale of 1:500 horizontal and 1:50 vertical and shall include the following:
- Key Plan (complete with North Arrow)
 - Appropriate signature / approval signing block
 - Design criteria/standards/considerations (for example, design and posted speed, design vehicle and e-rate) for the existing, initial and ultimate stages.
 - Proposed access locations (including width and curve radii)
 - Approved access locations and turn bay requirements (taper and bay lengths as identified with TIA).
 - Horizontal and vertical alignment.
 - Pedestrian and cyclist accessibility, curb ramps, and bus stop requirements.
 - Typical and non-typical road cross-sections showing lane width, sidewalks, shared-use path, streetlights, trees, utilities alignments, ditch, berms, noise attenuation, superelevation.
 - Pipeline/railway crossing conflicts; upgrade requirements.
 - Existing and proposed property lines, including all easements, surface and underground encroachments, and identify road right-of-way requirements
 - Pavement marking that indicates lane width and turn bay/taper requirements.
 - Existing accesses and infrastructure.
- 7.3.5 Identify permanent and temporary construction on the initial stage relative to the ultimate stage.
- 7.3.6 Conceptual horizontal and vertical alignments for storm drainage may be required.
- 7.3.7 Show both existing and proposed utilities (both surface and underground), including but not limited to streetlights, traffic signals, trolley poles, overhead signs, secondary electrical, sanitary, water, gas, power, telephone and cable.
- 7.3.8 Additional project specific information may be requested.

7.4 Complete Submissions

- 7.4.1 All engineering drawings submitted to the City for approval must be signed and sealed by a registered professional engineer and shall be stamped with a permit to practice seal where appropriate. Engineering drawing submissions shall be complete and shall be accompanied by all supporting documents, calculations, cost information and geotechnical reports or other information as required by the City.
- 7.4.2 Incomplete submissions, submissions found to contain excessive omissions or errors, or which do not include appropriate authentication of professional authorship, may be returned without review or comment, at the discretion of the Engineer.

7.5 General Requirements for Engineering Drawings

- 7.5.1 Each drawing shall include the following:
- a suitable title and key plan, identifying the name and location of the project;

- the scale of the drawing;
- a north direction indicator; and
- an appropriate signature block for City approvals.

7.5.2 All dimensions and measurements shown in the engineering drawings shall be in metric units. All elevations shown in the engineering drawings shall be referenced to geodetic datum and shall be noted as such.

7.5.3 The standard drawing size of 841 mm by 594 mm (A1) shall be used.

7.5.4 All lettering must be a minimum of 2 mm high.

7.5.5 For consistency it is suggested that abbreviations and drawing symbols used in the engineering drawings be consistent with those used by the City. These can be obtained by contacting the person noted in Section 12. A legend for these symbols and abbreviations shall also be provided on the engineering drawings.

7.5.6 The engineering drawings are to provide a complete description of all existing and proposed municipal improvements, including any provisions for future extensions of utilities and systems.

7.6 Typical Plans Included with Engineering Drawings

7.6.1 The cover sheet shall indicate the name of the subdivision as determined by the Office of Development Coordination, the stage of development, the Subdivision Authority approval number and names of both the Developer and Consultant, and a key plan.

7.6.2 The index plan shall be prepared to fit the standard size sheet. This plan should be a copy of the Legal Plan, or Preliminary Legal Plan and shall indicate that portion of a street that relates to a particular plan/profile drawing.

7.6.3 The topography and land use plan should be prepared to a 1:1000 scale and shall indicate the existing contours at a 0.5 m interval and the proposed land uses for each lot or parcel of land as defined in the Edmonton Zoning Bylaw No. 12800. The plan should also indicate all stands of trees and existing buildings that will remain.

7.6.4 The road, sidewalk and walkway overall plan shall be drawn to a scale of 1:1000 and shall indicate:

- All walks, shared-use paths, alleys, carriageway widths and alignments.
- Catch basins and manholes. However, dimensions need not be included.
- The alignments and widths of all existing and proposed immediately surrounding streets, alleys, walks, ditches and other pertinent topographical features.
- The limits of contracts and financial responsibility for the project.
- The proposed bus routing, bus stops and bus stop pads.
- Location and type of street identification signs.
- All access points into the proposed subdivision, including temporary access connections, emergency accesses, and temporary turnarounds if required.

7.6.5 The lot grading plan shall be drawn to a scale of 1:1000 and shall indicate the proposed finished lot corner elevations, the proposed finished grades at the buildings, the direction of flow of surface drainage on the lots, the original ground contours, proposed curb alignments and any required scales. Proposed building elevations and sewer service invert elevations may be shown. This plan should meet the requirements of and be acceptable to Canada Mortgage and Housing Corporation and shall comply with all requirements of the Surface Drainage Bylaw No. 11501. All lots requiring bearing certificates for foundations on fill, disturbed or unstable soil shall be clearly identified on the lot grading plan.

7.6.6 The sanitary, storm and water main overall plan shall be drawn to a scale of 1:1 000 and shall indicate the locations of the alignments of sanitary sewers, storm sewers, water mains and services, stormwater management facilities and all associated easements.

7.6.7 Telecommunications, gas and power overall plans shall indicate the alignments of telephone, gas and power utilities and shall be drawn to a scale of 1:1 000. These plans shall be included in the set of engineering drawings submitted to the City for review.

- 7.6.8 The street furniture plan shall include all surface improvements including roads, sidewalks, walkways, catch basins, entrance features, telecommunication pedestals, Canada Post mailboxes and their pads, street lights, transformers, switching cubicles and hydrants. Anticipated driveway locations and orientation should also be included if that information is available. Street identification and traffic signs should also be shown.
- 7.6.9 Detailed plans and profiles for streets and alleys shall be drawn to a scale of 1:500 horizontal and 1:50 vertical and shall include the following:
- legal subdivision;
 - street and walkway names and numbers;
 - road, alley, shared-use path and sidewalk alignments;
 - bus stop pads and walk connections;
 - alignments of immediately adjacent existing or proposed streets, walks, alleys, roads and ditches, interim access connections and alignment data;
 - chainage of proposed utility alignments;
 - chainage or property line ties to correlate plan and profile;
 - existing ground profile;
 - intersection grades, including PI and $\frac{1}{4}$ pt elevations
 - profiles of proposed lip of gutters, alley grades and cross elevations for all intersecting roadways;
 - grade of proposed and field-established elevations of existing local improvements affecting proposed design;
 - gutter elevations of catch basins;
 - curb elevations at beginning and end of corner radii, horizontal and vertical curves and locations where a break in grade takes place;
 - centreline grades on profiles may be required.
 - grind and overlay limits at tie-ins to existing roads.
 - temporary surface and underground drainage infrastructure, as required.
 - temporary and permanent easements where applicable.

Cross-sections should be shown on a separate plan. They should be cross-referenced and show the offsets of road and sidewalk, streetlight, trees, above and underground utilities, relative to the property lines, and pavement structure for roadway construction. The title should specify the exact portion of the roadway covered by each drawing.

- 7.6.10 Detailed plans and profiles for walkways and shared-use paths shall be drawn to a scale of 1:500 horizontal and 1:50 vertical and shall include the following:
- legal subdivision;
 - street and walkway names and numbers;
 - alignment of walks and immediately adjacent roads and sidewalks;
 - alignment and grade data on existing and proposed walks and shared-use paths;
 - chainage or property line ties to correlate plans and profiles;
 - existing ground profiles;
 - proposed edge of walk grades;
 - walk elevations at walk intersections, drainage locations and street intersections;
 - existing and proposed utility installations;
 - berm grading and drainage and back-of-lot elevations of adjacent subdivisions;
 - typical cross-sections showing the type of walk; and
 - pavement structure details and utility placements.

Cross-sections could be shown on a separate plan and cross-referenced. The title should specify the exact portion of walkway covered by each drawing.

- 7.6.11 Landscape plans shall be drawn to a scale of 1:500 horizontal and shall include the following:
- legal subdivision;
 - street and walkway names and numbers;
 - walk alignments;
 - utility alignments;
 - alignments of immediately adjacent existing and proposed streets, walks, roads and ditches;

- berm locations;
- selection, size, quantity, conditions and installation, specification and location of trees and shrubs;
- locations of walkway furniture, waste receptacles, other landscape enhanced amenities and street lighting;
- fence details
- entrance feature details, where applicable.

Cross-sections could be shown on a separate plan and cross-referenced. The title should specify the general location and include all applicable offsets.

- 7.6.12 Details of structures, facilities and improvements which are identical to those in the standard drawings provided in this document are to be included in the engineering drawings. PDF reproductions are acceptable. All other structures or unique improvements shall also be included on the detail plans.

7.7 Engineering Drawings Submitted for Approval

A drawing approval form should accompany the engineering drawings submitted for the City's approval.

7.8 Design Revisions after Approval

Where it is necessary, for any reason, to make any changes to the engineering drawings after they have been approved, the Consultant shall obtain approval of those changes prior to proceeding with construction of the specific part of the improvement for which the design change is proposed. Four prints of each of the original approved drawings affected shall be submitted to the appropriate City department(s) with the proposed changes shown in red, accompanied by a letter outlining reasons and justification. If the proposed changes meet with the approval of the appropriate City department(s), one copy will be signed and returned, accompanied by a letter authorizing the changes to be made on the original. The changes shall be reflected on the appropriate "as-built" drawings. No changes other than those accepted are to be made to any original approved drawing.

8. EASEMENTS AND RESTRICTIVE COVENANTS

- 8.1 The Developer shall be responsible for providing or obtaining all necessary easements to protect municipal improvements not located within a public road right-of-way or utility lot.
- 8.2 The Developer shall prepare any required right-of-way plans. Upon written request from the Developer, the City shall prepare easement and restrictive covenant documents according to the standard City formats, with special provisions as required, naming the City as the Grantee. Once easements and restrictive covenant documents have been fully executed, the Developer shall have them registered at the Land Titles Office and provide one duplicate original copy of the registered document to the Policy and Planning Section, Land and Buildings, Asset Management and Public Works Department. Similarly, the Developer shall be responsible for registering all right-of-way plans at the Land Titles Office.
- 8.3 All permanent easements shall be registered prior to application for a construction completion certificate.
- 8.4 Temporary construction easements shall normally be registered in favour of the Developer, unless otherwise required by the City. Temporary construction easements may be required to be registered prior to C.C.C. issuance at the discretion of the City.

9. PIPELINE, RAILWAY AND POWER TRANSMISSION LINE CROSSINGS

9.1 Crossing Agreement Requirement

- 9.1.1 Where a crossing of gas, oil, power transmission lines, or railway is required by a Developer in the process of servicing land, the Developer shall be responsible for obtaining and coordinating all aspects of the crossing agreement.

- 9.1.2 The Developer shall prepare and submit plans to the proper authorities and obtain the necessary permissions to enter upon, cross over, or construct under or over any gas, oil, or power transmission lines or railways.
- 9.1.3 Where the conditions or provisions of the agreement include long term commitments or obligations beyond the development build out schedule the City shall be provided an opportunity to review and approve to ensure compliance with any other franchise or master agreements.
- 9.1.4 The Developer shall comply with all terms and conditions of the crossing agreement.

9.2 Transfer of Crossing Agreement to the City

Prior to application for a construction completion certificate for a municipal improvement, the Developer shall apply to the City and the company to have all applicable crossing agreement transferred to the City's name. A construction completion certificate will not be issued until the crossing agreement is transferred to the City.

10. LAND REQUIREMENTS

10.1 Land Acquisition

- 10.1.1 The Developer is responsible to acquire any land required to accommodate the proposed municipal improvements. The land required by the City to service the development must be registered into road right-of-way, utility right-of-way, or public utility lot via road plan and/or subdivision plan.

11. GENERAL REQUIREMENTS FOR AS-BUILT DRAWINGS

Prints of revised approved design drawings showing as-built information shall be submitted by the Consultant. The drawings shall be professionally restamped, signed and dated to indicate as-built information. Some City departments may require an additional submission of as-built plans in an acceptable electronic format.

11.1 As-Built Requirements for Surface Improvements

- 11.1.1 All data shown on the construction drawings shall be changed to as-built information, including:
 - Elevations of the catch basins, manhole covers and curb returns on the plan and profile drawings, as well as any grade changes which exceed the design grade by more than 0.1% (or 25mm).
 - Curve radii, distances from back-of-walk to property line and sidewalk widths on the plan and profile drawings.
 - Type of curb, whether rolled faced or vertical faced on the overall plan.
 - Elevations at either top-of-curb or lip-of-gutter.
 - The month and year of completion and the name of the contractor.
- 11.1.2 If the cross-section design has been changed in width or structure, then this shall be changed to as-built on the typical section plan.

11.2 As-Built Requirements for Underground Improvements

- 11.2.1 Prints of approved design drawings with revisions shown in red may be acceptable, at the discretion of the Engineer. Refer to the appropriate chapters of this document for further information required on as-built drawings for drainage, water, power and landscape improvements.
- 11.2.2 After completion of construction and installation of municipal improvements and following the issuance of construction completion certificates, as-built drawings shall be submitted for review by the applicable City department not later than six months prior to the expiration of the maintenance period for each type of municipal improvement. At this stage, the drawings shall be stamped: **"This drawing indicates as-built information"**.

12. SYMBOLS AND ABBREVIATIONS FOR USE ON ENGINEERING DRAWINGS

Symbols and abbreviations for use on engineering drawings can be obtained as electronic files from the General Supervisor, Mapping and Records, Drainage Services, telephone number (780) 496 5442.

1. GENERAL

1.1 Scope

This section explains the responsibility of the Developer with respect to the Construction Specifications included in this document in accordance with the Servicing Agreement.

1.2 Responsibilities of the Developer

1.2.1 The Developer shall make certain that throughout the entire development process feasible implementation methods are established and responsibilities are assigned to ensure that all municipal improvements are constructed in accordance with the Servicing Agreement and in accordance with good engineering practices.

1.2.2 The Developer is responsible for ensuring that their Contractors carry out their responsibilities under the Construction Specifications.

1.3 Definitions

Throughout the Construction Specifications the following definitions shall apply

1.3.1 The terms the **City**, the **Developer**, the **Consultant**, the **Landscape Architect**, the **Servicing Agreement** and the **Engineering Drawings** shall be as defined in Chapter 1, Section 2.

1.3.2 The terms the **Engineer**, **Quality Control**, **Quality Assurance Laboratory** and **Qualified Laboratory** shall be as defined in Section 01420 – Definitions and Standards.

1.3.3 The **Contractor** is the company employed by the Developer to undertake all or part of the Work under the Servicing Agreement.

1.4 Compliance with Drawings and Specifications

1.4.1 Engineering Drawings

All construction of improvements shall be in compliance with the engineering drawings approved by the City. Where subsequent to approval of the engineering drawings changes are necessary to account for unexpected site conditions the Developer should obtain the approval of those changes prior to construction of the specific part for which the change is proposed. Refer to Chapter 1, Section 7.7, for the procedure to apply for approval of revisions to the engineering drawings.

1.4.2 Specifications

All construction of improvements shall be in compliance with the Construction Specifications, unless instructed otherwise in writing, and the City is the interpreter of the acceptability of the work covered by the Servicing Agreement. Should the City, acting reasonably, determine that the Work does not comply with the specifications then, notwithstanding any instructions provided to the Contractor by the Developer's Engineer, the City will have the right to refuse acceptance until all defects have been rectified.

1.4.3 Condition of Contract

The Conditions of Contract and Instructions to Bidders available through the City's website are intended for City contracts only and do not apply to contracts with a Developer.

1.5 Provision for Review During Construction

1.5.1 It is the responsibility of the Developer to ensure that the construction of all improvements is subject to review during construction by a Consultant acting on behalf of the Developer. This Consultant shall be responsible for all aspects of the execution of the project.

1.5.2 The Developer shall ensure that the Consultant has a representative on site during the construction of the improvement to ensure compliance with the Construction Specifications.

- 1.5.3** The Developer shall ensure that the Consultant provides all equipment, tools, and labour necessary for all inspection, quality control, and administrative duties required during construction. Inspection by the City is for monitoring only and is not sufficiently comprehensive to address the requirements for quality control, activity coordination or safety. The City's inspection shall not relieve the Developer of full responsibility for all aspects of the Work.

1.6 Pre-Construction Requirements

1.6.1 Identification of existing utilities

The Developer is responsible for identifying and obtaining all required agreements related to existing utilities, oil, gas, power transmission, railways, or other structures above or below ground, in or abutting the development, that may affect the proposed construction.

1.6.2 Construction at pipeline rights-of-way

1.6.2.1 Notice prior to starting work

The Consultant shall co-ordinate a meeting on site with the pipeline inspector, contractor, and City representative in attendance, 48 hours prior to any construction activity in the immediate vicinity of a pipeline right-of-way. At this meeting, the scheduling, notices, special agreement provisions, and any other requirements, will be reviewed and will be recorded by the Consultant with copies of minutes taken and distributed to the City representative.

1.6.2.2 Fencing of oil and gas pipeline rights-of-way

No construction activity is to occur in a development where there is an existing or adjoining oil or gas pipeline right-of-way until the right-of-way is fully fenced. The minimum acceptable requirement is snow fencing.

1.7 Notices to City Departments

1.7.1 Notice of commencement of work.

The Developer shall give 48 hours written notice to the City before commencement of work, change in work schedule, or working hours in order to co-ordinate adequate City inspection staff. This notice shall at the same time be conveyed directly to the City Departments responsible for the type of improvements being constructed.

1.7.2 Notice to the Traffic Engineer.

In accordance with City Policy 1074, at least 48 hours in advance of any closing of developed City streets, the Developer shall provide notice of the closing in writing to the Traffic Engineer, Transportation and Streets Department. The Traffic Engineer is also to be notified when the affected streets are re-opened to traffic. The Developer is responsible for obtaining all necessary permits for working within the existing road rights-of-way. The Developer shall follow the provisions of Section 01550 – Vehicular Access and Parking.

1.7.3 Notice when crossing utilities or railways.

Where utilities or railways will be crossed or affected by any Developer's works, notification shall be given to the agency concerned prior to construction, as required by the agency.

1.7.4 Fire hydrant use.

If water is needed at a work site, the Developer shall apply for a hydrant use permit from Epcor Water Services for using fire hydrants in accordance with their instructions and procedures, at least 5 days before the intended usage. Call Epcor Water Services at 412-6879.

1.8 Developer's Responsibility for Material

The Developer shall be responsible for all materials furnished. All municipal improvement components, materials, appurtenances and accessories shall be expedited, supplied, loaded, hauled, unloaded, distributed, and installed at the site of the project by the Developer.

1.8.1 Certification of materials quality

1.8.1.1 The Developer shall produce certification by a professional engineer or an approved independent testing authority that all materials being furnished conform to the applicable specifications.

1.8.1.2 Where material supplied not only conforms to the CSA Standards, but is also certified by the CSA, this shall be deemed to satisfy the requirement for certification by an independent testing authority.

1.8.2 Inspection and testing of material

1.8.2.1 All materials shall be subject to inspection and testing and shall be certified as conforming to the applicable materials standard by an approved independent testing authority or professional engineer. The professional engineer must be familiar with the materials being tested and the testing methods. All certifications, and test results as requested are to be provided to the City. Materials may still be subject to inspection by the City. All testing and inspection shall be done in accordance with specified standards and all material shall have a minimum of one test performed.

1.8.2.2 Certification of the material by the Canadian Standards Association shall be deemed to satisfy the requirements for certification by an independent testing authority.

1.8.3 Unsuitable materials

1.8.3.1 All materials that are defective in manufacture, have been damaged in transit or have been damaged after delivery shall be replaced by the Developer.

1.8.3.2 If other than approved materials are incorporated in the Work, or if any materials are found during the progress of the Work to have cracks, flaws, or to be otherwise unsuitable, the Engineer or the authorized City inspector will reject them. These materials are to be promptly removed from the site by the Developer.

1.8.4 Storage of materials

The Developer shall be responsible for the safe storage of all material until it has been incorporated into the completed project.

1.9 Construction site safety

1.9.1 The Developer shall ensure that the Alberta Occupational Health and Safety Regulations are followed at all times on the construction site.

1.9.2 The Developer shall be responsible for ensuring that the work carried on by contractors on the Developer's behalf is done so in a safe manner with due care to the protection of workers and the public at large.

1.10 Protection of Existing Improvements**1.10.1 Protection and repair of infrastructure**

Where work is conducted in the vicinity of existing improvements, or connections to existing systems are included in the Work, the Developer shall protect the existing improvements from damage, and repair or replace improvements damaged or removed, such repair or replacement to be to the standards applicable to new work.

1.10.2 Continuity of service to existing development

The Developer is responsible for avoiding disruption of service to existing development or customers, and shall take measures as necessary to ensure continuity of service is maintained.

1.11 Preservation of Access to Abutting Developments

1.11.1 The Developer shall provide and maintain reasonable access to abutting places of business and other property where necessary, at the Developer's expense, unless stated otherwise.

1.11.2 When a street or alley is to be closed for construction, the Developer shall notify each abutting property owner, agent or tenant in writing at least 7 days prior to starting work.

1.12 Noise Abatement

- 1.12.1** The Noise Abatement Bylaw No. 7255, and amendments thereto, restricts the levels of noise permissible at various hours in residential and commercial/industrial districts of the City, and provides penalties for violations. The Developer may, before commencing work, apply in writing to the General Manager of Corporate Services, 4th Floor, Chancery Hall, for a special permit suspending provisions of the bylaw.

2. TRAFFIC CONTROL**2.1 OSCAM Permit**

Pursuant to Section 1306 of the Edmonton Traffic Bylaw (No. 5590), as amended, a permit shall be obtained from the Manager of Traffic Operations, Transportation and Streets Department, prior to performing on-street construction and maintenance work. The Developer is responsible for ensuring that such a permit exists for each location.

2.2 Procedures Manual for On-Street Construction Safety

The Developer shall obtain a copy of the "Procedures Manual for On-Street Construction Safety" from the Traffic Operations Branch of the Transportation and Streets Department and follow the standards and recommended procedures therein, and instruct field personnel accordingly.

2.3 Traffic Safety Devices

- 2.3.1** Except as provided in paragraphs 2.3.2 and 2.3.3 below, the Developer's contractor shall supply install and maintain signs, barricades bearing the Contractor's name, flashing lights, other safety devices, and flag-persons necessary to handle traffic around or through job sites and through designated detour routes. Before interfering with traffic flow, if requested by the City, the Developer shall submit for approval and information, a sketch plan showing the proposed layout of signs, barricades and lights. Failure to properly place and maintain devices will result in the issuance of a stop-work order until the problem is rectified, or will cause the City to place and maintain such devices and charge costs to the Developer.
- 2.3.2** The Traffic Operations Branch of the Transportation and Streets Department, with a minimum of 2 weeks prior notice, will provide and install regulatory signs, and will remove or cover them when necessary. The Developer shall maintain such signs in place.
- 2.3.3** The Traffic Operations Section of Transportation and Streets Department, with a minimum of 2 weeks prior notice, will provide, place and maintain traffic control signs and barricades for the following locations, at the Developer's expense:
- freeways;
 - downtown locations;
 - critical arterial routes;
 - major traffic re-routing when required; and
 - critical traffic conflict points.
- 2.3.4** Flag-person signs shall only be displayed when a flag-person is in the act of controlling traffic.
- 2.3.5** Advance warning signs shall only be displayed when there is interference with normal traffic flow.

3. DEALING WITH EXISTING INFRASTRUCTURE

3.1 Existing Signs and Meters

The Developer shall give at least 48 hours notice to the Traffic Operations Branch of the Transportation and Streets Department of a request to remove, cover, or relocate traffic signs and parking meters affected by construction.

3.2 Survey Monuments

The Developer shall ensure that no survey monument will be disturbed by construction activity. The City will charge the Developer for the cost of restoring disturbed monuments.

3.3 Sewer System Protection

3.3.1 The Developer shall prevent the entry into any downstream connecting sewer system silt, mud, and any other form of debris or material that might block, contaminate, or otherwise foul the downstream sewers.

3.3.2 The Developer shall provide catch basins and manholes with approved temporary covers to prevent debris from entering the sewer system. If debris does enter the system it should be cleaned out immediately if sewage is flowing, or at the end of the workday if the system is dry.

3.4 Entry and Manholes

3.4.1 No unauthorized person or equipment shall be allowed entry into any utility vault or manhole. If entry into such vault or manhole is necessary, the utility owner shall be notified at least 24 hours before the intended entry in order to obtain permission and proper instructions, and to be accompanied where necessary by a qualified representative of the utility. In addition, use proper procedures for entry into confined space as required by the Occupational Health and Safety Act and regulations thereunder.

4. TRENCH BACKFILL COMPLIANCE

4.1 Geotechnical Certificate

Upon completion of underground utility installations, the Developer shall provide to the City a certificate, issued by a geotechnical engineering firm, confirming that all backfill in utility trenches was placed in accordance with the specifications. If required by the City this certificate shall be provided before proceeding with surface improvements.

4.2 Representative Tests

Each predominant soil type encountered in the development site shall be represented by a Moisture Density relationship (standard Proctor test - ASTM D698 Method A) and an Atterberg limit test (ASTM D4318), with a minimum of two tests per development site. The standard Proctor test sample shall be obtained from the same location where a one-mould Proctor sample is taken. The results of all tests by location description and plot shall be assembled in a report that shall be submitted to the City prior to March 31 of the year following completion of the trench backfill.

5. MISCELLANEOUS

5.1 Staged Asphalt Construction

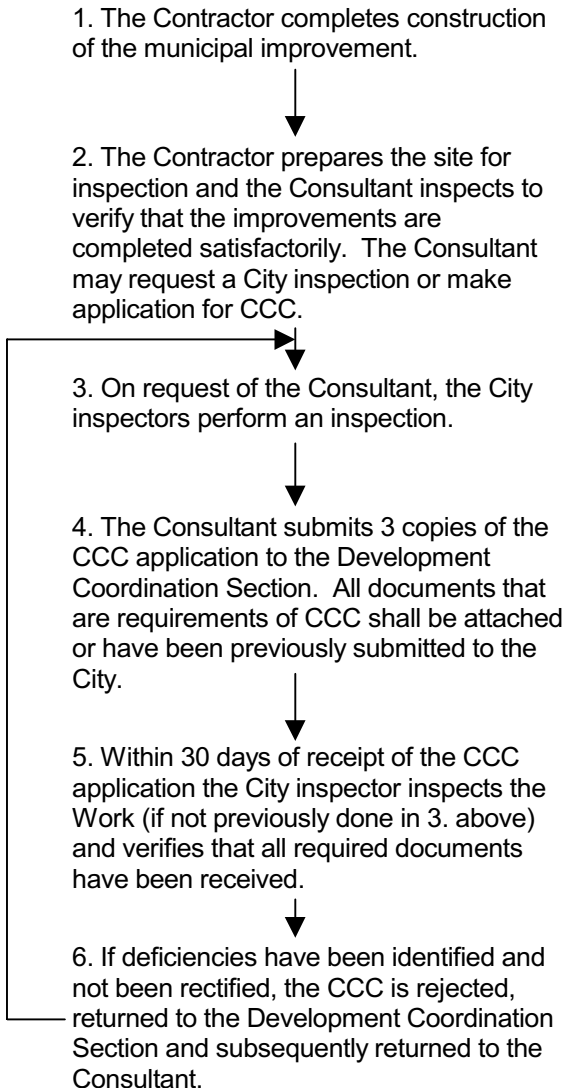
- 5.1.1 All roadways shall be constructed with the final surface lift placed in the year the subdivision is eligible for Final Acceptance. The City may accept cash-in-lieu for the final lift of asphalt if significant development has not occurred at the time of final acceptance
- 5.1.2 Asphalt placement shall be in accordance with Section 02605 – Hot-Mix Asphalt Concrete and Section 02741 - Hot-Mix Asphalt Paving, both in Volume 2 Roadways, and shall bring the roadway to its original design crown as shown on the engineering drawings, within the tolerances allowed in the FAC guidelines.
- 5.1.3 The final surface lift shall be placed after the concrete deficiencies are rectified and an additional one year materials and workmanship warranty will be required for the final lift after the final acceptance certificate is issued for surface improvements.

5.2 Topsoil Analysis

Topsoil analysis specified in Section 02910 – Topsoil, Volume 5 Landscaping will not be required for topsoil stripped from a development site and re-used on the site, unless the City suspects that the quality of the topsoil will not meet the growth and other requirements of Section 02910.

6. CONSTRUCTION ACCEPTANCE PROCEDURES FOR MUNICIPAL IMPROVEMENTS

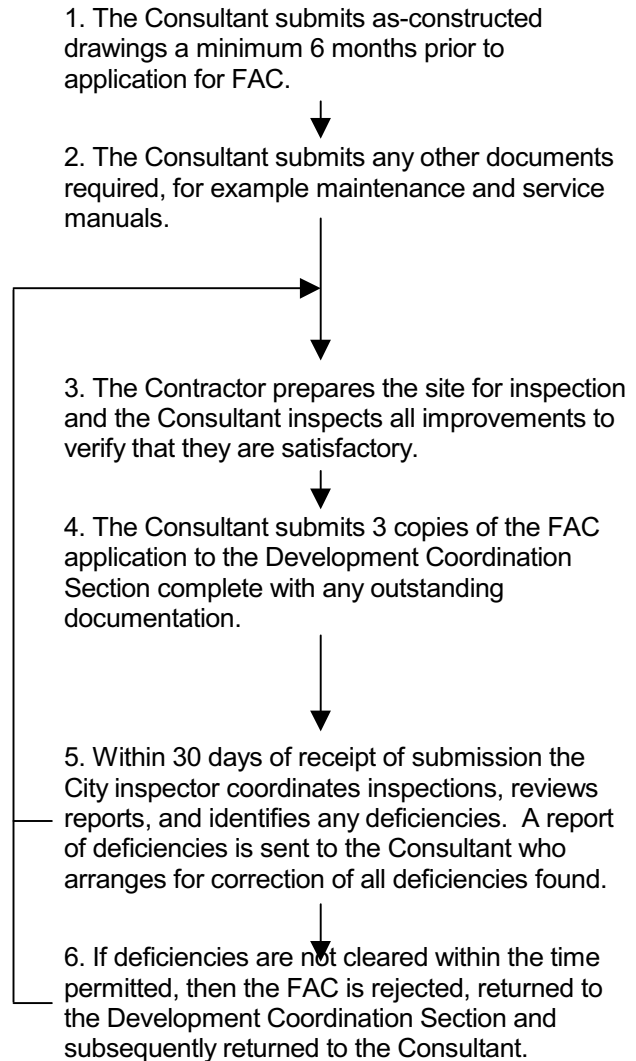
Construction Completion Certificate (CCC)



OR

The CCC is approved, maintenance starts and expiry dates are entered on the application. It is signed and returned to the Development Coordination Section for distribution.

Final Acceptance Certificate (FAC)



OR

The FAC is approved. It is signed and returned to the Development Coordination Section for distribution.

Note: If there are any discrepancies between these procedures and the terms of the Servicing Agreement, then the Servicing Agreement governs.

1.1 CONSTRUCTION SAFETY MEASURES

- 1.1.1 Observe and enforce construction safety measures required by National Building Code 1990 Part 8, Provincial Government, **Alberta Occupational Health and Safety Act and Regulations**, Workers' Compensation Board and municipal statutes and authorities.
- 1.1.2 The Contractor shall immediately bring any conflict between any provisions of the above authorities to the attention of the City, who shall give direction on which provisions shall apply.
- 1.1.3 All Contractors must complete the Transportation and Streets Department "Detour Seminar" if the City's roadways are to be affected in any way by the Work. The Contractor shall ensure that appropriate measures are taken to protect workers from the hazards created by traffic including the provision and wearing of safety vests at all times. Practices outlined in the current City of Edmonton Procedures Manual for On-Street Construction Safety should be implemented by the Contractor in conjunction with worker training.
- 1.1.4 If the work site has an existing emergency plan, the Contractor shall familiarize all of the workers on the work site of the contents of the plan.
- 1.1.5 The Contractor shall adhere to any key control system established by the City to protect the work site.
- 1.1.6 If the contract involves demolition, hot work, explosives, work over water, ground thawing, pesticide application, lasers, electrical or substance isolation (blanking, lockouts), radioactive and/or carcinogenic material then the Contractor shall develop procedures for dealing with these specific safety hazards. These procedures shall be made available to the City upon request. The Contractor shall ensure that these procedures include hazard assessment and control measures and that workers on the site that are exposed or potentially exposed to these hazards shall be familiar with and follow the procedures prescribed.
- 1.1.7 Before any demolition work commences, the demolition contractor shall hold a meeting on site with the Prime Contractor, affected contractors and subcontractors, the City and other interested parties to discuss the coordination, scheduling, safety, and all other aspects of the Work.
- 1.1.8 Before beginning construction work in any existing City facility, the Contractor shall meet with the City to discuss potentially hazardous material on the site. This shall include health hazards of a physical or chemical nature. The Contractor shall also conduct an on-site review of existing finishes, construction materials and equipment for additional hazardous material, paying special attention to any material that might contain asbestos, and notify the City in writing of their findings and proposed remediation or control measures. The City will then decide on the appropriate course of action. If further potentially hazardous material is discovered during construction, work in that area shall cease, access to the area shall be restricted and any material containing asbestos shall be protected from further deterioration. The Contractor shall immediately notify the appropriate Departmental representative to have the alleged hazardous materials identified using accepted test protocols. Authorization by the City to proceed with the Work will be contingent on test results.

1.2 SUBMISSIONS

Prior to the commencement of construction, submit to the City the following:

- 1.2.1 Copies of the Codes of Practice required by the Occupational Health and Safety Act for work to be performed on this project.
- 1.2.2 The City must receive the Codes of Practice at least 72 hours prior to commencement of construction. The City may provide comment to the Contractor regarding the Codes of Practice but this comment will not in any way reduce or limit the Contractor's responsibility for the safety of workers and/or the general public affected by the Work.

1.2.3 Information on contacts for safety matters namely:

- i. The name(s) of the person(s) who will ensure compliance with the applicable health and safety legislation.
- ii. The name of the site superintendent plus as many representatives as the Contractor determines are required to ensure adequate site supervision.
- iii. Twenty-four hour emergency contact person(s) and associated telephone number(s).

1.3 RESPONSIBILITIES FOR WORK SITES WITH MORE THAN ONE EMPLOYER

On all work sites where there is more than one employer the designated Prime Contractor is responsible for:

1.3.1 Ensuring that information is available on all contacts for safety matters as outlined in 1.2.3 above.**1.3.2** Ensuring that all information provided by the City of Edmonton on safety matters is communicated to all other work site contractors.**1.3.3** Establish and maintain a system or process that will ensure compliance with the Occupational Health and Safety Act and Regulations in respect of the work site, including:

- i. Documentation of the system or process for health and safety management that will be used at the work site.
- ii. Documentation of the site wide hazard assessment, critical tasks hazard assessment and codes of practice established for the work site.
- iii. Forwarding a copy of this documentation to the Occupational Health and Safety Services section of the Department responsible for the contract.

1.4 INSPECTION AND REPORTING**1.4.1** The Contractor shall conduct frequent inspections to ensure compliance with legislation. Any unsafe conditions or work practices observed shall be corrected as soon as possible. In the event of an imminent danger situation, Section 27 of the Occupational Health and Safety Act shall be followed. All reports provided by outside agencies, for example Alberta Human Resources and Employment, Workplace Health and Safety, shall be copied to the City within 24 hours following the inspection.**1.4.2** All serious or potentially serious accidents or incidents shall be reported as required by the Occupational Health and Safety Act. In addition the Occupational Health and Safety Services section of the appropriate Department shall be notified immediately and provided with a copy of the investigation report as soon as practicable.**1.5 ALBERTA ENVIRONMENTAL PROTECTION AND ENHANCEMENT ACT (AEPEA)**

The Contractor and subcontractors shall meet all aspects of the AEPEA. Contractors will be responsible for reporting all of their own and their subcontractors' releases or spills in or about the work site in accordance with the Act. Reporting shall be to the Director of Pollution Control, Alberta Environment. The City will be copied on all AEPEA reports.

1.6 PRE-CONSTRUCTION SAFETY MEETING**1.6.1** Prior to the commencement of work on the site, a meeting will be held with all of the personnel likely to be involved during the construction phase including consultants, designers, project managers, City safety consultants, Contractor's site and head office personnel, and subcontractors.**1.6.2** The meeting will discuss all aspects of site safety with specific reference to the way in which the Prime Contractor intends to discharge their responsibilities.**1.6.3** The City may raise particular aspects of the Occupational Health and Safety Act or related issues considered to be of special importance to the contract at this meeting.

END OF SECTION

PREAMBLE

1.0	General
1.1	Unless provision to the contrary is made in the terms of this section of the specifications, the measurement and payment stipulated shall constitute full compensation for the complete supply and installation of each item described.
1.2	Measurement and calculations made by the Engineer shall determine the quantity of work for which the Contractor shall be paid.
1.3	Monthly progress estimates shall be reasonably close to the actual work done, but do not necessarily require accurate measurement.
1.4	All work shall be accurately measured and agreed upon by the Contractor before the Construction Completion Certificate is issued.
1.5	Unless separate measurement and payment is specifically identified for any material or activity necessary to complete the project as specified any labour, equipment or material necessary for completion will be considered to be incidental to the price paid for the Work.
1.6	Payment shall be in accordance with the Schedule of Unit Prices appended to the Tender Form.
1.7	Related Contract Provisions Documents in the Contract that are related specifically to payment of work include but are not limited to the following: <div style="margin-left: 40px;"> General Conditions of Contract. Supplementary General Conditions. Tender Form: schedule of quantities and prices. Specifications: Sections applicable to each item of work. Special Provisions. </div>
2.0	Non Payment Items
2.1	Unless specifically stated otherwise the following activities shall be deemed to be included in the cost of the measurement items and/or in the general items and no additional payment will be made for these activities. <div style="margin-left: 40px;"> Provision of traffic safety Detours and accommodations to adjacent property Protection of surrounding areas from disfiguration and damage Restoration of damaged and disfigured areas. Correction of deficiencies Removal and Replacement of rejected work Protection of work Protection, maintenance and clean-up of haul routes Mix design and quality control Submittals and samples Arrangement and facilities for inspection Checkout and protection of utilities and survey monuments Clean-up of work site </div>

No.	Item	Unit	Payment Includes	Ref.
00.000	GENERAL SITE ACTIVITY			
00.001	Mobilization and Demobilization	Sum	Transport all required equipment to and from the site; supply and erect signs and markings to delineate the site; traffic control and diversions; supply and erect site offices; all other initial site works required for setting up of there move all offices, signs, temporary fencing and other equipment on completion; clean and restore all of the Work.	01520
00.002	Survey	Sum	Locate existing pins and delineate all boundaries locate existing rights-of-way, utilities, structures, etc.; establish limits of the working areas; establish project and grade lines, widths, depths, and elevations; monitor the Work for diversion from line and level; provide as-built surveys; prepare and submit as-built drawings; prepare and submit service, valve, valve chamber and hydrant reports as necessary.	01520
00.003	Site Signs	Number	Supply and erect signs; relocate as required; maintain and replace during the term of the Contract; dispose of signs as directed.	01520
99.999	Contingency Sum	Sum		S.P.

10.000 Grading
MEASUREMENT

Cubic metres of excavated material is measured by one of the following methods as determined by the Engineer:

1. Cross Section: Volume calculated by average end area method using cross sections
2. Truck Load: Volume calculated by counting full truck loads and applying the appropriate load factor, each full load deemed to be:
 - (a) For clay, silt, topsoil, peat: 2/3 of level volume of truck box.
 - (b) For sand and gravel: the level volume of truck box.
3. Negotiated: where cross-section or truck load method cannot be used, by agreement between the Engineer and Contractor prior to beginning work.

FREEHAUL

For the purposes of determining freehaul, the following definitions apply:

1. Jobsite: the area within the limits of any single location as listed in the Contract or as added under the terms of the Contract.
2. Freehaul: the hauling distance that is deemed included in the unit of excavation and defined according to the following cases:
 - (a) All hauling within a jobsite is freehaul.
 - (b) Where the Contractor is responsible for disposal of material to a dump location of the Contractor's choice, freehaul is the entire hauling distance.
 - (c) Where the Special Provisions designates a dump or borrow location for a particular excavation or borrow item, freehaul is the entire hauling distance between the jobsite and the designated dump or borrow location for that item.

(The Engineer reserves the right to designate an alternate dump or 'borrow location for that item at the same price, plus or minus any adjustment to the freehaul distance as agreed to between Contractor and Engineer.)

 - (d) Where the Contractor is directed to haul to a particular destination other than that referred to in the immediately preceding paragraphs 2.1, 2.2 and 2.3, freehaul is 1 kilometre outside the jobsite limits.

11.000	PAVEMENT AND CONCRETE REMOVAL			
11.011	Concrete walkway	Square Metre	Sawcut limits of removal where required; break and excavate; separate materials and/or remove unacceptable reinforcement; load, haul, and stockpiles salvageable materials at designated locations; haul and dispose of surplus materials including dumping fees if any; dust control; maintain and cleanup haul routes Variable: course type and thickness	02224
11.012	Concrete curb ramp			
11.013	Concrete crossing			
11.014	Concrete slab-on grade			
11.031	Concrete slab of varying thickness	Sq. Metre Centimetre		
11.032	Asphalt course			
11.033	Concrete course			
11.034	Soil cement course			
11.041	Concrete curb & gutter	Lineal Metre		
11.042	Concrete curb			
11.043	Concrete gutter up to 500 mm wide			
11.044	Concrete gutter greater than 500 mm. wide			

No.	Item	Unit	Payment Includes	Ref.
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12.000	CLEARING AND GRUBBING			
12.011	Clearing	Hectare	Fell trees; cut shrubs and other vegetation; saw, trim, chip or otherwise reduce debris to workable size, and load and haul to dump site; pay dumping fees if any; protect, maintain and cleanup haul routes.	02231
12.012	Clearing	Sq. Metre		
12.021	Clearing & Grubbing	Hectare	Fell trees; cut shrubs and other vegetation; saw, trim, chip or otherwise reduce debris to workable size; remove stumps and roots; separate topsoil from debris, load and haul to dump site; pay dumping fees if any; protect, maintain and cleanup haul routes.	
12.022	Clearing & Grubbing	Sq. Metre		

13.000	TRENCH AND BACKFILL			
	Excavate and Backfill Trenches	Lineal Metres	Excavate trench; supply and place Class B bedding as specified in table 02060.2; designation 7; class 10; supply imported fill where necessary; backfill and compact; dispose of surplus material.	02318 02060
	Type 1 Backfill			
	Pipe Size <= 150 mm			
13.011	<2m deep			
13.012	2 - 3 m deep			
13.013	3 - 4 m deep			
13.014	4 - 5 m deep			
13.015	5 - 6 m deep			
13.016	> 6m deep			
	Pipe Size 200 mm			
13.021	<2m deep			
13.022	2 - 3 m deep			
13.023	3 - 4 m deep			
13.024	4 - 5 m deep			
13.025	5 - 6 m deep			
13.026	> 6m deep			
	Pipe Size 250 mm			
13.031	<2m deep			
13.032	2 - 3 m deep			
13.033	3 - 4 m deep			
13.034	4 - 5 m deep			
13.035	5 - 6 m deep			
13.036	> 6m deep			
	Pipe Size 300 mm			
13.041	<2m deep			
13.042	2 - 3 m deep			
13.043	3 - 4 m deep			
13.044	4 - 5 m deep			
13.045	5 - 6 m deep			
13.046	> 6m deep			
	Pipe Size 375 mm			
13.051	<2m deep			
13.052	2 - 3 m deep			
13.053	3 - 4 m deep			
13.054	4 - 5 m deep			
13.055	5 - 6 m deep			
13.056	> 6m deep			
	Pipe Size 450 mm			
13.061	<2m deep			
13.062	2 - 3 m deep			
13.063	3 - 4 m deep			
13.064	4 - 5 m deep			
13.065	5 - 6 m deep			
13.066	> 6m deep			

No.	Item	Unit	Payment Includes	Ref.
13.071 13.072 13.073 13.074 13.075 13.076	Pipe Size 525 mm <2m deep 2 - 3 m deep 3 - 4 m deep 4 - 5 m deep 5 - 6 m deep > 6 m deep	Lineal Metre	Excavate trench; supply and place Class B bedding as specified in table 02060.2; designation 7; class 10; supply imported fill where necessary; backfill and compact; dispose of surplus material.	02318 02060
13.081 13.082 13.083 13.084 13.085 13.086	Pipe Size 600 mm <2m deep 2 - 3 m deep 3 - 4 m deep 4 - 5 m deep 5 - 6 m deep > 6 m deep			
13.091 13.092 13.093 13.094 13.095 13.096	Pipe Size 675 mm <2m deep 2 - 3 m deep 3 - 4 m deep 4 - 5 m deep 5 - 6 m deep > 6 m deep			
13.101 13.102 13.103 13.104 13.105 13.106	Pipe Size 750 mm <2m deep 2 - 3 m deep 3 - 4 m deep 4 - 5 m deep 5 - 6 m deep > 6 m deep			
13.111 13.112 13.113 13.114 13.115 13.116	Pipe Size 900 mm <2m deep 2 - 3 m deep 3 - 4 m deep 4 - 5 m deep 5 - 6 m deep > 6 m deep			
13.121 13.122 13.123 13.124 13.125 13.126	Pipe Size 1050 mm <2m deep 2 - 3 m deep 3 - 4 m deep 4 - 5 m deep 5 - 6 m deep > 6 m deep			
13.131 13.132 13.133 13.134 13.135 13.136	Pipe Size 1200 mm <2m deep 2 - 3 m deep 3 - 4 m deep 4 - 5 m deep 5 - 6 m deep > 6 m deep			
13.141 13.142 13.143 13.144 13.145 13.146	Pipe Size 1350 mm <2m deep 2 - 3 m deep 3 - 4 m deep 4 - 5 m deep 5 - 6 m deep > 6 m deep			

No.	Item	Unit	Payment Includes	Ref.
13.151 13.152 13.153 13.154 13.155 13.156	Pipe Size =>1500 mm <2m deep 2 - 3 m deep 3 - 4 m deep 4 - 5 m deep 5 - 6 m deep > 6 m deep	Lineal Metre	Excavate trench; supply and place Class B bedding as specified in table 02060.2; designation 7; class 10; supply imported fill where necessary; backfill and compact; dispose of surplus material.	02318 02060
13.301	Additional Payment for Granular backfill (Type 2)	Lineal Metre	Additional payment to supply and place Type 2 backfill from top of bedding to underside of surface restoration.	02318
13.302	Additional Payment for Granular backfill (Type 3)	Lineal Metre	Additional payment to supply and place Type 3 backfill from top of bedding to underside of surface restoration.	
13.303	Additional Payment for Fillcrete backfill (Type 4)	Lineal Metre	Additional payment to supply and place Type 4 backfill from top of bedding to underside of surface restoration.	02317 02318
13.311	Additional Payment for Fine Granular Bedding	Tonne	Additional payment to supply and place fine granular bedding.	02318 02515
13.312	Additional Payment for Coarse Granular Bedding	Tonne	Additional payment to supply and place coarse granular bedding.	02318 02515
13.313	Additional Payment for Washed Gravel Bedding	Tonne	Additional payment to supply and place washed gravel bedding.	
13.411	Additional Payment for Class A Bedding	Lineal Metre	Additional payment to supply and place Class A bedding.	
13.412	Additional Payment for Class C Bedding	Lineal Metre	Additional payment to supply and place Class C bedding.	
13.413	Additional Payment for Class D Bedding	Lineal Metre	Additional payment to supply and place Class D bedding.	
13.511	Additional Payment for Rock Excavation	Lineal Metre	Drill, blast or jack hammer rock; remove and dispose of rock; supply of backfill material to replace removed rock; backfill and compact.	02318
13.512	Additional Payment for Extra Excavation of Unsuitable Material	Lineal Metre	Excavate, remove and dispose of unsuitable material; provide all equipment and material required to stabilize ground; Supply of backfill material to replace unsuitable material; backfill and compact. ground water control and disposal.	

16.000	GRANULAR MATERIAL			
16.011 16.012	Supply Gravel to City Pile 3-20 3-63	Tonne	Furnish pit material, crush and screen; haul processed aggregate to designated location and stockpile; provide weigh tickets and where necessary, weigh scales and checker accommodation. The mass of moisture in excess of 4% by mass of dry aggregate shall be deducted from the tonnage supplied. Variable: Aggregate designation and class as per Table 02060.1 and 02060.2.	02060
16.021	Supply Gravel to Jobsite Gravel 3-20 base by weight	Tonne	Supply to designated jobsite; adjust aggregate moisture content as necessary; mix and spread in required lifts to crown and grade; compact; provide weigh tickets and where necessary, weigh scales and checker accommodation. 	

No.	Item	Unit	Payment Includes	Ref.		
16.041 16.042	Supply City Gravel from Stockpile to Jobsite 3-20 by weight 3-20 base by weight	Tonne	Load and haul from City stockpile to designated jobsite; adjust aggregate moisture content as necessary; mix and spread in required lifts to crown and grade; compact; provide weigh tickets where necessary. Variable: Aggregate designation and class as per Table 02060.1 and 02060.2	02060		
16.043 16.044 16.045 16.046	50 mm. gravel 3-20 base 100 mm. gravel 3-20 base 150 mm. gravel 3-20 base 200 mm. gravel 3-20 base	Square Metre				
16.051 16.052	3-63 by weight 3-63 base by weight	Tonne				
16.053 16.054 16.055 16.056 16.057 16.058	100 mm. gravel 3-63 base 150 mm. gravel 3-63 base 200 mm. gravel 3-63 base 250 mm. gravel 3-63 base 300 mm. gravel 3-63 base 450 mm. gravel 3-63 base	Square Metre				
16.061	Scarify and restore gravel road	Square Metre				
16.062	Windrow and restore gravel road	Square Metre				
					Clean area; scarify to depth indicated; pulverize to 50 mm pieces; mix; dry or wet as necessary; respread to crown and grade and compact.	
					Clean area, windrow and move gravel; respread, scarify to depth indicated; pulverize; mix; dry or wet as necessary; final spreading to crown and grade and compact. Subsoil excavation, backfill, and subgrade preparation will be paid for separately.	
17.000	GABIONS					
17.010	Gabions	Cubic Metre	Supply gabion baskets, components, binding wire or fasteners, and connecting wires; assemble and place baskets on site; place geotextile if required; supply and place rock fill.	02373		
18.000	GEOTEXTILE FILTER FABRIC					
18.010	Non-woven Geotextile Filter Fabric	Square Metre	Supply and lay under or over stone filter media. Include for preparing surfaces, fastening in position, all overlaps or wrapping and protection as required.			
20.000	CONCRETE					
20.011 20.021	Joint sealant Preformed joint filler	Lineal Metre	Supply and application of sealant. Supply and placement of filler. Variable: Filler thickness and depth.	03055 03060 03310		
20.031 20.032 20.033 20.034	Extra reinforcing bar 10M Extra reinforcing bar 15M Extra tie bar 10M Extra tie bar 15M	Lineal Metre	Supply, cut and place reinforcing or tie bars if ordered in addition to those originally specified in the work item. Variable: Reinforcing or tie bar size.	03210		
20.041	Extra wire mesh	Square Metre	Supply, cut and place wire fabric if ordered in addition to that originally specified for an item.	03055 03210		

No.	Item	Unit	Payment Includes	Ref.
20.201	Class A Concrete Pavement Volume	Cubic Metre	Clean subgrade or subbase surface; supply materials; design and produce class A concrete mix; supply and place concrete, tie bars, curing compound; finish; make construction and isolation joints; backfill at lane edges; remove and replace rejected concrete pavement.	02751 03060
20.202	150 mm. thick	Square Metre		
20.203	175 mm. thick			
20.204	200 mm. thick			
20.205	225 mm. thick			
20.206	250 mm. thick			
20.207	150 mm. thick in lane			
20.211	Sawcut and Seal Concrete Joint	Lineal Metre	Premark lines of cut; cut with concrete saw clean the sawcut; supply and apply sealant; Variable: Type of joint and sealant.	
20.221	Additional Payment for Stronger Class A Concrete High extra strength	Cubic Metre	Extra payment when Class A concrete poured on or before September 30 has attained its specified 7-day minimum strength.	02751 03060
20.222	5 MPa high extra strength		Extra payment for providing a strength higher than that originally specified for Class A concrete. The extra payments are due only if the Engineer ordered the higher strengths and they are confirmed by the applicable strength tests. Variable: Higher strength increments of 5MPa and 10 MPa.	
20.223	10 MPa high extra strength			
20.224	Extra Payment for Type 50 Cement		Extra payment for using Type 50 in lieu of Type 10 cement in Class A concrete. This extra payment is due only if such cement substitution was ordered by the Engineer.	
20.231	Class B Concrete Base By volume	Cubic Metre	Clean subgrade or subbase surface; supply materials; design and produce Class B concrete mix; place concrete and tie bars; finish; make joints; supply curing compound and cure; backfill at lane edges. Variable: Completed base thickness in mm; Road unless lane is specified	03060 02712
20.232	150 mm. thick	Square Metre		
20.233	175 mm. thick			
20.241	Additional Payment for Stronger Class B Concrete High early strength	Cubic Metre	Extra payment when Class B concrete poured on or before September 30 has attained its specified 7-day minimum strength.	03060 02712
20.242	5 MPa high strength		Extra payment for providing a strength higher than that originally specified for Class B concrete. The extra payments are due only if the Engineer ordered the higher strengths and they are confirmed by the applicable strength tests.	
20.243	10 MPa high strength			
20.244	Extra Payment for Type 50 Cement		Extra payment for using Type 50 in lieu of Type 10 cement in Class B concrete. This extra payment is due only if the cement substitution was ordered by the Engineer.	
20.251	Supply of Concrete Class C mix	Cubic Metre	Supply materials; design and produce specified class of concrete mix; supply concrete mix to jobsite.	03060
20.261	Class D mix			
20.271	Class E mix			

No.	Item	Unit	Payment Includes	Ref.
20.252	Additional Payment for Stronger Class C Concrete High early strength	Cubic Metre	Extra payment when Class C concrete poured on or before September 30 has attained its specified 7-day minimum strength.	
20.253 20.254	5 MPa high strength 10 MPa high strength		Extra payment for providing a strength higher than that originally specified for Class C concrete. The extra payments are due only if the Engineer ordered the higher strengths and they are confirmed by the applicable strength tests.	
20.255	Extra Payment for Type 50 Cement		Extra payment for using Type 50 in lieu of Type 10 cement in Class C concrete. This extra payment is due only if the cement substitution was ordered by the Engineer.	
	Additional Payment for Stronger Class D Concrete	Cubic Metre		03060
20.262	High early strength		Extra payment when Class D concrete poured on or before September 30 has attained its specified 7-day minimum strength.	
20.263 20.264	5 MPa high strength 10 MPa high strength		Extra payment for providing a strength higher than that originally specified for Class D concrete. The extra payments are due only if the Engineer ordered the higher strengths and they are confirmed by the applicable strength tests.	
20.265	Extra Payment for Type 50 Cement		Extra payment for using Type 50 in lieu of Type 10 cement in Class D concrete. This extra payment is due only if the cement substitution was ordered by the Engineer.	
	Additional Payment for Stronger Class E Concrete	Cubic Metre		03060
20.272	High early strength		Extra payment when Class E concrete poured on or before September 30 has attained its specified 7-day minimum strength.	
20.273 20.274	5 MPa high strength 10 MPa high strength		Extra payment for providing a strength higher than that originally specified for Class E concrete. The extra payments are due only if the Engineer ordered the higher strengths and they are confirmed by the applicable strength tests.	
20.275	Extra Payment for Type 50 Cement		Extra payment for using Type 50 in lieu of Type 10 cement in Class E concrete. This extra payment is due only if the cement substitution was ordered by the Engineer.	

ROAD BASE

30.000	SUBGRADE PREPARATION			
	Subgrade Preparation			02335
30.010 30.020	150 mm. deep 300 mm. deep	Square Metre	Disk or scarify the soil; dry or wet the soil as necessary; compact to the specified density; trim to final grade Variable: Prepared subgrade depth in mm	

No.	Item	Unit	Payment Includes	Ref.
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31.000	CEMENT STABILIZED SUBGRADE			
31.010 31.020	Cement Stabilized Subgrade 150 mm. thick 300 mm. thick	Square Metre	Pregrade soil to designated grade and cross section; scarify, pulverize, blade and dry soil as necessary; supply mix soil, cement and water; repulverize and remix where required; spread, shape and compact the mixture to required density; moistening the surface and trim to final grade. Variable: stabilized subgrade depth in mm	02342
31.030	Cement for Stabilizing by Weight	10 Kg	Supply and spread cement at designated rate for stabilizing subgrade. If cement spread is less than the designated rate, only the actual quantity spread will receive payment. No payment will be made for cement spread in excess of the designated rate.	

33.000	SOIL CEMENT			
	Plant-mix Soil Cement		Supply of materials; design and plant production of soil cement mix supply of mixture to jobsite; spread, compact and finish; make joints; supply curing seal and cure: protect finished surface; curing seal and curing; supply, spread and remove blotting sand if required. Variable: thickness in mm of completed soil cement base or subbase; road unless lane is specified in item.	02713
	For Roads			
33.011	By Weight	Tonne		
33.012 33.013 33.014	150 mm thick 200 mm thick 250 mm thick	Square Metre		
	For Lanes			
33.021 33.022	By Weight 150 mm thick	Tonne Square Metre		
33.211 33.212 33.213	Road-mix Soil Cement 150 mm thick for roads 200 mm thick for roads 150 mm thick for lanes	Square Metre	Exploratory cutting; recompact the exploratory cut; preshape surface; scarify and pulverize base; dry out material if required; supply water mix aggregate, cement and water; spread the mix, compact and finish make joints; supply curing seal and cure; protect finished surface; supply and spread blotting sand if required. Cement supply and spreading is covered in Item 33.231	02714
33.231	Cement for Road-mix by Weight	10 Kg	Supply and spread cement at designated rate for road-mix soil cement. If cement spread is less than designated rate, only the actual quantity spread will receive payment. No payment will be made for cement spread in excess of the designated rate.	03060
33.301 33.302	Geotextile fabric woven Geotextile fabric unwoven	Square Metre	SP required because no M&P exist.	S.P.
22.401 33.402 33.403 33.404	25 polystyrene insulation 50 polystyrene insulation 75 polystyrene insulation 100 polystyrene insulation	Square Metre	SP required because no M&P exist.	S.P.

No.	Item	Unit	Payment Includes	Ref.
PAVING				
40.000	ASPHALT CONCRETE			
40.211	Tack Coat	Square Metre	Clean surface of loose and foreign matter; supply and apply specified liquid asphalt; protect and cure coated surfaces.	
40.212	Prime Coat	Square Metre	Clean surface of loose and foreign matter; supply and apply specified liquid asphalt; protect and cure coated surfaces.	
40.411	Asphalt Surface By Weight	Tonne	Prepare the receiving surface including supply and application of tack coat; supply of materials; design and produce asphalt surface hot-mix; supply of hot mix to jobsite, spread and compact; place joints; finish. Variable: Completed surface thickness in mm.; Road unless lane is specified.	
40.412	50 mm. Asphalt surface	Square Metre		
40.413	75 mm. Asphalt surface	Square Metre		
40.421 40.422	Asphalt overlay (ACS) Asphalt overlay (ACO)	Tonne	Sweep the pavement; supply and apply tack coat and hot-mix levelling course; supply of materials; design and produce asphalt overlay hot-mix; supply of hot mix to jobsite; place, compact and finish. Variable: Completed overlay thickness in mm.	
40.431	Asphalt Base By Weight	Tonne	Prepare the receiving surface including supply and application of tack coat; supply of materials; design and produce asphalt base hot-mix; supply hot-mix to jobsite; spread and compact Variable: Thickness in mm. unless stated	
40.432	75 mm. thick in road	Square Metre		
40.433	75 mm. thick in lane	Square Metre		
40.441	Asphalt overlay, walk	Tonne	Prepare the receiving surface including supply and application of tack coat; supply of materials; design and produce asphalt surface hot-mix; supply of hot mix to jobsite, spread and compact; place joints; finish. Variable: Completed residential overlay thickness mm. Road unless lane is specified.	02741
40.451	Residential Asphalt In Road By Weight	Tonne	Prepare the receiving surface including supply and application of tack coat; supply of materials; design and produce asphalt surface hot-mix; supply of hot mix to jobsite, spread and compact; place joints; finish. Variable: Completed residential overlay thickness mm.	02741
40.452	50 mm. average depth	Square Metre		
40.453	75 mm. average depth	Square Metre		
40.454	100 mm. average depth	Square Metre		
40.461	In Lane By Weight	Tonne		
40.462	50 mm. average depth	Square Metre		
40.463	75 mm. average depth	Square Metre		
40.471 40.472	Miscellaneous Overlay, by weight Lane prefill	Tonne		
40.481	Adjust Water, Telephone and Power Vault to Final Grade	Number	Supply all equipment and material to adjust the vaults; backfill and compact around raised vault; finish concrete or asphalt surface to vault cover and frame.	S.P.
40.611 40.612	Recycled asphalt base by weight, for road by weight, for lane	Tonne	Prepare the receiving surface including supply and application of tack coat; supply materials; process RAP; design and produce recycled asphalt base hot-mix; supply hot-mix to jobsite; spread and compact; place joints; finish. Variable: Road unless lane is specified in item.	02966 02969
40.613	By area, for road	Square Metre per Centimetre		
40.614	By area, for lane	Square Metre per Centimetre		

No.	Item	Unit	Payment Includes	Ref.
40.621	Recycled residential asphalt By Weight	Tonne	Prepare the receiving surface including supply and application of tack coat; supply materials; process RAP; design and produce recycled residential asphalt hot-mix; supply hot-mix to jobsite, spread and compact; place joints; finish. Variable: Thickness in mm. of completed recycled residential asphalt. Road unless lane is specified in item.	02966 02969
40.622	50 mm. thick	Square		
40.623	75 mm. thick	Metre		
40.901	Miscellaneous Clean and Patch Joint	Metre	See special provisions.	S.P.
40.902	Asphalt Patch Mix	Tonne	See special provisions	
40.903	Joint repair asphalt base 600 mm wide	Tonne	See special provisions	
40.904	Glasgrid	Metre	See special provisions	
41.000	PAVEMENT COLD MILLING			
41.011	Cold Milling by weight	Tonne	Clean pavement surface before milling; mill asphalt or concrete surface; load and haul millings to designated location or Contractor's stockpile; cleanup of milled surface; cleanup spillage on haul route.	02961
41.012	by area	Square Metre per Centimetre		
41.013	25 mm. depth	Square Metre		
41.014	50 mm. depth			
41.015	0-50 mm. depth			
41.016	0-75 mm. depth			
41.017	25-50 mm. depth			
41.018	50-75 mm. depth			
41.019	75-100 mm. depth			
41.021	225 mm. depth			
41.022	225-250 mm. depth			
41.031	50-100 mm., 600 mm.wide	Metre		
42.000	PAVEMENT CRACK SEALING			
42.010	Crack rout and seal	Lineal Metre	Rout and clean cracks and joints; supply and apply sealant; supply and place blotting sand where required.	02975
42.020	Lane crack rout and seal			
42.030	Residential crack rout and seal			
42.040	Crack seal only	Lineal Metre	Clean cracks and joints; supply and apply sealant; supply and place blotting sand where required.	
43.000	SLURRY SEAL			
43.010	Slurry seal type 1	Square Metre	Supply materials; design and produce emulsified asphalt slurry seal; clean and prepare the existing pavement surface for sealing; supply and apply slurry seal	02786
43.011	Slurry seal type 2			

No.	Item	Unit	Payment Includes	Ref.
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OTHER ROADWORK

50.0	CONCRETE CURB, GUTTER, WALKWAY AND SLABS			
50.011 50.012 50.013 50.014	150 mm. Curb and Gutter 250x200 mm 250x225 mm 250x250 mm 250x275 mm	Lineal Metre	Trim and clean subgrade or base: supply materials; design and produce Class C concrete mix; supply and place concrete, tie bars, curing compound; finish; make joints; supply and place backfill behind curb.	02770
50.021 50.022 50.023 50.024	150 mm. Curb and Gutter 500x200 mm 500x225 mm 500x500 mm 500x275 mm	Lineal Metre		
50.031 50.032	25 mm. Face Increment to 250 mm gutter to 500 mm gutter	Lineal Metre		
50.033 50.034	50 mm. Height Increment to 150 mm curb to 150 mm mono curb	Lineal Metre		
50.041 50.042 50.043 50.044 50.045 50.046 50.047 50.048	200 mm. Curb and Gutter 250x200 mm 250x225 mm 250x250 mm 250x275 mm 500x200 mm 500x225 mm 500x500 mm 500x275 mm	Lineal Metre	Trim and clean subgrade or base; supply materials; design and produce Class C concrete mix; supply and place concrete, tie bars and curing compound; finish; make joints; supply and place backfill behind curb. Note: Only to be used where there is existing 200 mm curb.	02770
50.051 50.052 50.053 50.054 50.055	Rolled Curb and Gutter Gutter 200x250 mm Gutter 200x250 mm with 250 mm doweled curb Gutter 500x200 mm Gutter 1000x225 mm Gutter 1000x250 mm	Lineal Metre	Trim and clean subgrade or base; supply materials; design and produce Class C concrete mix; supply and place concrete, tie bars and curing compound; finish; make joints; supply and place backfill behind curb.	
50.061 50.062 50.063 50.064 50.065 50.066 50.067	Miscellaneous Concrete Installations Walk Curb ramp Lane/commercial crossing Private crossing Median strip 150 mm. median slab-on 200 mm. median slab-on	Square Metre	Supply and place granular levelling course as necessary; supply materials; design and produce Class C concrete mix; supply and place concrete, tie bars dowels, reinforcement; supply curing compound and cure; finish; make joints; supply and place backfill along edges. Variable: Size and depths as per drawings.	
50.101 50.102 50.103 50.104 50.105 50.106 50.107 50.108	Monolithic 1.5 metre Walkway, 150 mm. Curb and Gutter Gutter 250x200 mm deep Gutter 250x225 mm deep Gutter 250x250 mm deep Rolled curb and gutter 250x200 mm deep Gutter 500x200 mm deep Gutter 500x225 mm deep Gutter 500x250 mm deep Gutter 500x275 mm deep	Lineal Metre	Supply and place granular levelling course as necessary; supply materials; design and produce Class C concrete mix; supply and place concrete, tie bars, reinforcement, curing compound; finish; make joints; supply and place backfill along edges.	

No.	Item	Unit	Payment Includes	Ref.
50.111	Monolithic 1.5 metre Lane/Commercial Crossing 150 mm. Curb Gutter 250x200 mm deep			
50.112	Gutter 250x225 mm deep			
50.113	Gutter 250x250 mm deep			
50.114	Gutter 500x200 mm deep			
50.115	Gutter 500x225 mm deep			
50.116	Gutter 500x250 mm deep			
50.117	Gutter 500x275 mm deep			
50.121	Monolithic 1.5 metre Private Crossing 150 mm. Curb Gutter 250x200 mm deep			
50.122	Gutter 250x225 mm deep			
50.123	Gutter 250x250 mm deep			
50.124	Gutter 500x200 mm deep			
50.125	Gutter 500x225 mm deep			
50.126	Gutter 500x250 mm deep			
50.127	Gutter 500x275 mm deep			
50.150	Sawcut Concrete Joint	Lineal Metre	Premark line of cut, saw and clean the sawcut joint ready for sealant.	
50.151	Concrete Sawcutting	Metre Centimetre	Cut concrete with concrete saw.	
50.152	Adjust Curb and Gutter	Lineal Metre	Raise or lower curb and gutter; supply and place compacted granular base; restore ground behind curb.	
50.201	Supply and Install Concrete Pavers 60 mm. thick	Square Metre	Prepare surface of base for bedding sand; supply and place bedding sand, concrete pavers and joint sand. Variable: Shape and colour	02783
50.202	80 mm. thick			
50.211	Supply Only Concrete Pavers 60 mm. thick	Square Metre	Supply concrete pavers; deliver to site and stack at designated location. Variable: Shape and colour	
50.212	80 mm. thick			
50.221	Paver Edge Restraint	Lineal Metre	Supply and place specified materials. Variable: Type of restraint	
50.231	Paver Weed Barrier	Lineal Metre	Supply and place specified weed barrier materials. Paver Weed Barrier Variable: Type of weed barrier	
50.232	Paver Insulation	Square Metre	Supply and place specified insulation materials. Variable: Type and thickness of insulation.	
50.401	Patterned Concrete Pavement	Square Metre	Clean subgrade or subbase surface; supply materials; design and produce class A coloured concrete mix; supply and place concrete mix, dowels, reinforcement, tie bars, curing compound; finish as per specified pattern and texture; make construction and isolation joints; backfill at lane edges; provide the City with stamping tools for repair and maintenance purposes. Variable: complete pavement thickness in mm. Road unless lane is specified in item.	02782
50.402	Patterned Concrete Sawcut Joint	Lineal Metre	Premark lines of cut; cut with concrete saw; clean the sawcut; supply and apply sealant. Variable: Type of joint and sealant.	

No.	Item	Unit	Payment Includes	Ref.
50.403	Patterned Concrete Walkway	Square Metre	Supply and place granular levelling course as necessary; supply materials; design and produce class C coloured concrete mix; supply reinforcement, dowels, tie bars, curing compound; finish as per specified pattern and texture; making joints; supply and placing of backfill along edges; provide the City with stamping tools for repair and maintenance purposes. Removing and replacing rejected work; correcting deficiencies; cleanup; and providing the City with stamping tools for repair and maintenance purposes. Variable: concrete slab type and width.	
50.601	Paving Brick on Sand Bed	Square Metre	Prepare surface of base for bedding sand; supply and place bedding sand, paving brick, and joint sand; correction of deficiencies; cleanup. Variable: Brick thickness in mm. shape	02781
50.602	Paving Brick Supply Only	Square Metre	Supply of paving brick, delivery to and stacking at designated location. Variable: Brick thickness in mm. shape and colour.	
50.603	Mortared Paving Brick	Square Metre	Prepare concrete surface for mortar; supply and place bedding, mortar, paving brick, and joint mortar; Variable: Brick thickness in mm. shape and colour.	02783

51.000	PAVEMENT MARKINGS			
	See Special Provisions for Measurement and Payment of Pavement Markings			S.P.

52.000	SLAB JACKING			
52.153	Slab Jacking	Cubic Metre	See Special Provisions	S.P.

55.000	CONCRETE BARRIER			
55.011 55.012	Slipformed median barrier Slipformed parapet	Lineal Metre	Supply materials; design and produce concrete mix; supply and place concrete, reinforcement, tie bars, joint sealant and curing compound; hand form and place concrete around light poles and at transition segments; finish; place joints; Variable: Type of barrier and cross sectional dimensions as per reference drawings	02841
55.021 55.023	Precast median barrier Precast parapet	Number	Supply and install precast units at designated locations. Variable: Type of barrier and cross sectional dimensions as per reference drawings	
55.031 55.032 55.033 55.034 55.035	Precast MinibARRIER Supply only Supply and place Haul and place Relocate on jobsite (SP required for end treatments)	Number	Supply only: supply and deliver precast units to designated locations. Supply and Place: supply and install precast units at designated locations. Haul and Place: load precast units from designated pickup location, deliver and install at designated site. Remove to Stockpile: remove and load precast units from designated site and delivery to designated storage location. Relocate on Jobsite: pick up and re-install from one location to another within the jobsite.	

No.	Item	Unit	Payment Includes	Ref.
57.000	BOX BEAM GUARD RAIL			
57.011	Box Beam Guard Rail	Lineal Metre	Fabricate, supply and deliver to site box beam guard rail and associated posts, fittings and fastenings; saw or drill post holes as necessary; set posts; patch holes; install rail.	02845
57.021 57.022	Approach Rail End Rail	Number	Fabricate, supply and deliver to site approach or end rail and associated posts, fittings and fastenings; saw or drill post holes as necessary; set posts; patch holes; install rail; excavate backfill and restore surface for anchor; supply and set concrete anchor.	

WATER MAINS AND SERVICES

61.000	WATER MAINS			
61.001 61.002 61.003 61.004 61.005 61.006 61.007	Install New Water Mains by Trenching PVC 150 mm. diameter 200 mm. diameter 250 mm. diameter 300 mm. diameter 450 mm. diameter 600 mm. diameter 750 mm. diameter	Lineal Metre	Supply and install pipe, fittings, flange, isolation kits, transition connections, couplings & field closures; supply and install thrust restraint; supply and install cathodic protection as required; CCTV inspection if specified; pressure test; chlorinate; flush; water control and disposal. supply and install cathodic protection as required.	02511
61.021 61.022 61.023 61.024 61.025 61.026 61.027 61.028 61.029 61.030 61.031	Steel 150 mm. diameter 200 mm. diameter 250 mm. diameter 300 mm. diameter 450 mm. diameter 600 mm. diameter 750 mm. diameter 900 mm. diameter 1050 mm. diameter 1200 mm. diameter 1350 mm. diameter			
61.041 61.042 61.043 61.044 61.045 61.046 61.047	Concrete Cylinder 450 mm. diameter 600 mm. diameter 750 mm. diameter 900 mm. diameter 1050 mm. diameter 1200 mm. diameter 1350 mm. diameter			
61.061 61.062 61.063 61.064 61.065 61.066 61.067 61.068 61.069 61.070 61.071	Ductile Iron 150 mm. diameter 200 mm. diameter 250 mm. diameter 300 mm. diameter 450 mm. diameter 600 mm. diameter 750 mm. diameter 900 mm. diameter 1050 mm. diameter 1200 mm. diameter 1350 mm. diameter			

No.	Item	Unit	Payment Includes	Ref.
61.091 61.092	PVC Hydrant Lead 150 mm. diameter 200 mm. diameter			
61.301 61.302 61.303 61.304 61.305	Replace Existing Water Mains by Trenching PVC 150 mm. diameter 200 mm. diameter 250 mm. diameter 300 mm. diameter 450 mm. diameter	Lineal Metre	Remove existing pipe as required; supply and install pipe, fittings, flange, isolation kits, transition connections, couplings and field closures; supply and install thrust restraint; supply and install cathodic protection as required; provide temporary water supply to affected properties; replace and restore existing utilities; CCTV inspection if specified; pressure test; chlorinate; flush; water control and disposal.	
61.321 61.322 61.323 61.324 61.325	Steel 150 mm. diameter 200 mm. diameter 250 mm. diameter 300 mm. diameter 450 mm. diameter			
61.361 61.362 61.363 61.364 61.365	Ductile Iron 150 mm. diameter 200 mm. diameter 250 mm. diameter 300 mm. diameter 450 mm. diameter			
61.391 61.392	PVC Hydrant Lead 150 mm. diameter 200 mm. diameter			
61.501 61.502 61.503 61.504 61.505 61.506 61.507	Install New Water Main by Augering, Boring or Tunnelling PVC 150 mm. diameter 200 mm. diameter 250 mm. diameter 300 mm. diameter 450 mm. diameter 600 mm. diameter 750 mm. diameter	Lineal Metre	Supply and install: casing pipe, casing insulators and spacers; pipe, fittings, flange isolation kits, transition connections, couplings and field closures; thrust restraint and cathodic protection. Excavate, backfill and compact auger and receiving pits. Replace and restore existing utilities. Pressure test, chlorinate and flush; water control and disposal.	02511
61.521 61.522 61.523 61.524 61.525 61.526 61.527 61.528 61.529 61.530 61.531	Steel 150 mm. diameter 200 mm. diameter 250 mm. diameter 300 mm. diameter 450 mm. diameter 600 mm. diameter 750 mm. diameter 900 mm. diameter 1050 mm. diameter 1200 mm. diameter 1350 mm. diameter			

No.	Item	Unit	Payment Includes	Ref.
61.541 61.542 61.543 61.544 61.545 61.546 61.547 61.548 61.549 61.550 61.551	Ductile Iron 150 mm. diameter 200 mm. diameter 250 mm. diameter 300 mm. diameter 450 mm. diameter 600 mm. diameter 750 mm. diameter 900 mm. diameter 1050 mm. diameter 1200 mm. diameter 1350 mm. diameter			
61.591 61.592	PVC Hydrant Lead 150 mm. diameter 200 mm. diameter			
61.601 61.602 61.603 61.604 61.605	Replace Existing Water Main by Pipe Bursting or Extraction PVC 150 mm. diameter 200 mm. diameter 250 mm. diameter 300 mm. diameter 450 mm. diameter	Lineal Metre	Excavate insertion and receiving pits; supply pipe bursting or extraction equipment; supply and install pipe, fittings, transition connections, couplings and field closures; backfill and compact pits; restore surface; replace and restore existing utilities; pressure test, chlorinate and flush; water control and disposal	02511
61.701 61.702 61.703 61.704 61.705 61.706	Reline Existing Water Main with H.D. Polyethylene 150 mm. diameter 200 mm. diameter 250 mm. diameter 300 mm. diameter 450 mm. diameter 600 mm. diameter	Lineal Metre	Excavate insertion and receiving pits; prepare existing water main for lining insertion; supply and install liner; reconnect existing lines and services; backfill and compact pits; restore surface; pressure test, chlorinate and flush; water control and disposal	

No.	Item	Unit	Payment Includes	Ref.
61.801 61.802 61.803 61.804 61.805	Abandon Water Main 150 mm. diameter 200 mm. diameter 250 mm. diameter 300 mm. diameter 450 mm. diameter	Lineal Metre	Close off ends of water mains; remove services and fill with sand or sand/cement grout as required.	02511
62.000	VALVES AND HYDRANTS			
62.001 62.002 62.003 62.004 62.005	Install Buried Valves Gate Valves 150 mm. diameter 200 mm. diameter 250 mm. diameter 300 mm. diameter 450 mm. diameter	Number	Supply and install valve and casing set; supply and place thrust restraint; apply protective coating; supply, install and test cathodic protection.	02512
62.021 62.022 62.023 62.024 62.025 62.026	Butterfly Valves 150 mm. diameter 200 mm. diameter 250 mm. diameter 300 mm. diameter 375 mm diameter 450 mm. diameter			
62.101 62.102 62.103 62.104 62.105 62.106 62.107 62.108 62.109 62.110	Install Valves in Chamber Gate Valves 150 mm. diameter 200 mm. diameter 250 mm. diameter 300 mm. diameter 450 mm. diameter 600 mm. diameter 750 mm. diameter 900 mm. diameter 1050 mm. diameter 1200 mm. diameter	Number	Supply and install main line valves and actuators in sizes noted; include the following, not measured separately: - air and/or vacuum release valve, - check valves, - pipeline drain control valves, - fittings and pipe supports, - pipe restraints, - flange isolation kits. Supply and construct chamber including all ladders, access covers, pipe lifting hooks, ventilation and marker posts. Waterproof exterior of chamber.	02511
62.121 62.122 62.123 62.124 62.125 62.126 62.127 62.128 62.129 62.130 62.131	Butterfly Valves 150 mm. diameter 200 mm. diameter 250 mm. diameter 300 mm. diameter 450 mm. diameter 600 mm. diameter 750 mm. diameter 900 mm. diameter 1050 mm. diameter 1200 mm. diameter 1350 mm. diameter			
62.141 62.142 62.143 62.144 62.145 62.146 62.147 62.148	Valve Actuators up to 300 mm. diameter 450 mm. diameter 600 mm. diameter 750 mm. diameter 900 mm. diameter 1050 mm. diameter 1200 mm. diameter 1350 mm. diameter			

No.	Item	Unit	Payment Includes	Ref.
62.201 62.202	Hydrants new replacement	Number	Remove and dispose of existing hydrant where necessary; supply and install hydrant, control valve, main between control valve and hydrant; supply and place bedding; backfill and compact to finished surface; surface restoration; paint hydrant on completion; water control and disposal.	02513
63.000	CATHODIC PROTECTION	Apply only to the installation of Cathodic Protection systems and/or components on existing water distribution or transmission mains as a separate operation. Cathodic Protection for new or replacement mains shall be included in the price of those activities.		
63.101 63.102 63.103	Individual Anodes Magnesium 7.7 kg 9.1 kg 14.5 kg	Number	Excavate; supply and install anodes; run anode wire to test station; backfill holes and compact to base of surface restoration; restore surface.	02516
63.121 63.122 63.123	Zinc 2.3 kg 5.5 kg 10.9 kg			
63.201	Test Station Standard	Number	Excavate, supply and install cast iron anode casing c/w water main wires, continuity bond, interference cell, reference cell, utility wires, supply and place bedding and backfill and compact to base of surface restoration; restore surface.	
63.202	Test Station Isolation Joint	Number	Excavate; install isolation joint; supply and install cast iron anode casing c/w water main wires; supply and place bedding; backfill and compact to base of surface restoration; restore surface.	
63.301 63.302 63.303 63.304 63.305	Anode Banks Horizontal Offset 4 anodes per bank 6 anodes per bank 8 anodes per bank 10 anodes per bank 12 anodes per bank	Number	Supply and install anodes and PVC conduit as required, header cables, anode lead wires; perform all wire connections; run anode lead wires to test station; backfill holes and compact to base of surface restoration; restore surface.	
63.321 63.322 63.323 63.324 63.325	Anode Banks Vertical Offset 4 anodes per bank 6 anodes per bank 8 anodes per bank 10 anodes per bank 12 anodes per bank			
63.401	Continuity Bonds/Test Leads in Chambers	Number	Supply and install test leads, and continuity bonds in valve and meter chambers.	
63.501	Isolation Joint without Test Station	Number	Excavate; supply and install isolation joint; supply and place bedding; backfill and compact to base of surface restoration; restore surface.	

No.	Item	Unit	Payment Includes	Ref.
64.000	WATER SERVICES	Measured from outside of main water line to property line or point of connection if less.		
64.001 64.002 64.003 64.004 64.005 64.006 64.007 64.008	Install New Water Services 20 mm. diameter 25 mm. diameter 40 mm. diameter 50 mm. diameter 100 mm. diameter 150 mm. diameter 200 mm. diameter 250 mm. diameter	Number	Excavate to property line; dispose of existing service if necessary; supply and install piping, corporation cock, curb cock, casings and spindle; connect to main line; supply, install and test cathodic protection; supply and place bedding; backfill and compact to base of surface restoration; restore surface; install temporary marker post if required.	02514
64.101 64.102 64.103 64.104 64.105 64.106 64.107 64.108	Install Replacement Water Service, Short Side 20 mm. diameter 25 mm. diameter 40 mm. diameter 50 mm. diameter 100 mm. diameter 150 mm. diameter 200 mm. diameter 250 mm. diameter	Number		
64.201 64.202 64.203 64.204 64.205 64.206 64.207 64.208	Install Replacement Water Service, Long Side 20 mm. diameter 25 mm. diameter 40 mm. diameter 50 mm. diameter 100 mm. diameter 150 mm. diameter 200 mm. diameter 250 mm. diameter	Lineal Metre		
64.301 64.302 64.303 64.304 64.305 64.306 64.307 64.308	Reconnecting Existing Water Services 20 mm. diameter 25 mm. diameter 40 mm. diameter 50 mm. diameter 100 mm. diameter 150 mm. diameter 200 mm. diameter 250 mm. diameter	Number		
64.401 64.402 64.403 64.404 64.405 64.406 64.407 64.408	Replace Existing Curb Cocks Short Side 20 mm. diameter 25 mm. diameter 40 mm. diameter 50 mm. diameter 100 mm. diameter 150 mm. diameter 200 mm. diameter 250 mm. diameter	Number	Excavate; dispose of existing curb cock; supply and install curb cock; supply , install and test cathodic protection; supply and place bedding; backfill and compact to base of surface restoration; restore surface.	

No.	Item	Unit	Payment Includes	Ref.
64.501 64.502 64.503 64.504 64.505 64.506 64.507 64.508	Replace Existing Curb Cocks Long Side 20 mm. diameter 25 mm. diameter 40 mm. diameter 50 mm. diameter 100 mm. diameter 150 mm. diameter 200 mm. diameter 250 mm. diameter	Number	Excavate; dispose of existing curb cock; supply and install curb cock; supply , install and test cathodic protection; supply and place bedding; backfill and compact to base of surface restoration; restore surface.	02514
64.601	Adjust water valve	Number	Remove the top casing during construction and replace to final grade; backfill and compact. If the casing seizes or breaks due to no fault of the Contractor, the cost of replacing the casing including additional backfill and compaction will be considered extra work; Water valve adjustment that involve only turning the casing up or down to final grade will not be paid for.	02512

SEWERS

70.000	INSTALL SEWERS, DRAINS, AND CULVERTS BY TRENCHING	Measured between centre lines of manholes, c.b. manholes and catch basins unless stated.		
70.001 70.002 70.003 70.004 70.005 70.006 70.007 70.008 70.009 70.010 70.011 70.012 70.013 70.014	Reinforced Concrete Main Line Pipe 250 mm. diameter 300 mm. diameter 375 mm. diameter 450 mm. diameter 525 mm. diameter 600 mm. diameter 675 mm. diameter 750 mm. diameter 900 mm. diameter 1050 mm. diameter 1200 mm. diameter 1350 mm. diameter 1500 mm. diameter 1650 mm diameter and up	Lineal Metre	Remove existing pipe if necessary; supply and install pipe; connect to manholes; C.C.T.V. inspection; infiltration/exfiltration testing; water control and disposal; bypass pumping as required. Variable: Depths as shown on drawings Class and type of pipe	02535 02634
70.021 70.022 70.023 70.024 70.025 70.026	Unreinforced Concrete Main Line Pipe 250 mm. diameter 300 mm. diameter 375 mm. diameter 450 mm. diameter 525 mm. diameter 600 mm. diameter			
70.030 70.031 70.032 70.033 70.034 70.035 70.036 70.037 70.038 70.039	PVC Main Line Pipe 200 mm. diameter 250 mm. diameter 300 mm. diameter 375 mm. diameter 450 mm. diameter 525 mm. diameter 600 mm. diameter 675 mm. diameter 750 mm. diameter 900 mm. diameter			

No.	Item	Unit	Payment Includes	Ref.
70.201 70.202 70.203	Concrete Catch Basin Leads 200 mm. diameter 250 mm. diameter 300 mm. diameter	Lineal Metre	Remove existing pipe if necessary; supply and install pipe; connect to manholes; C.C.T.V. inspection; infiltration/exfiltration testing; water control and disposal; bypass pumping as required. Variable: Depths as shown on drawings Class and type of pipe	02634
70.211 70.212 70.213	PVC Catch Basin Leads 200 mm. diameter 250 mm. diameter 300 mm. diameter			
70.301 70.302 70.303 70.304 70.305 70.306 70.307 70.308 70.309 70.310	Abandon Sewers 200 mm. diameter 250 mm. diameter 300 mm. diameter 375 mm. diameter 450 mm. diameter 525 mm. diameter 600 mm. diameter 675 mm. diameter 750 mm. diameter 900 mm. diameter	Lineal Metre	Close off ends of sewers; remove services and fill with sand or sand/cement grout as required.	02535 02634
70.401 70.402 70.403 70.404 70.405 70.406 70.407 70.408 70.409	Corrugated Steel Pipe (C.S.P.) Culvert 300 mm. diameter 400 mm. diameter 500 mm. diameter 600 mm. diameter 700 mm. diameter 800 mm. diameter 900 mm. diameter 1000 mm. diameter 1200 mm. diameter	Lineal Metre	Trench excavation; remove soft subsoil replace with compacted fill; compact base; supply, spreading and compact pipe and accessories; supplying, granular and clay bedding; assemble and lay pipe; repair damaged coating; supply, place and compact granular backfill to base of surface restoration; place clay seal; supply, place and remove temporary protective fill; water control and disposal.	02640
70.421 70.422 70.423 70.424 70.425 70.426 70.427 70.428 70.429	C.S.P. Culvert Flared Ends 300 mm. diameter 400 mm. diameter 500 mm. diameter 600 mm. diameter 700 mm. diameter 800 mm. diameter 900 mm. diameter 1000 mm. diameter 1200 mm. diameter	Number	Supply and install flared end; backfill and compact; form finished surface to upper edge of flare.	
70.441	Riprap Bags	Number	Supply of low slump concrete and burlap sacks bag; place the filled bags; moist cure.	
70.451	Trash Rack	Number	Supply and installation of trash rack.	
70.461 70.462 70.463 70.464 70.465 70.466 70.467 70.468 70.469	Remove CSP Culvert up to 300 mm. diameter 400 mm. diameter 500 mm. diameter 600 mm. diameter 700 mm. diameter 800 mm. diameter 900 mm. diameter 1000 mm. diameter 1200 mm. diameter	Lineal Metre	Excavate; remove existing culvert pipe and deliver to designated location or dispose of; replace with compacted backfill if required.	02640
70.601	Subdrain Pipe	Lineal Metre	Excavate; supply and install pipe; supply and place geotextile fabric and filter; place aggregate; connect pipe to catch basin, manhole, or sewer; backfill and compact. Variable: Type of pipe	02620

No.	Item	Unit	Payment Includes	Ref.
70.801 70.802 70.803 70.804 70.805	Sewer Services 100 mm. diameter 150 mm. diameter 200 mm. diameter 250 mm. diameter 300 mm. diameter	Lineal Metre	Excavate to property line; dispose of existing service; supply and install service; connect to main sewer line and existing service; backfill and compact; restore surface; provide location marker at property boundary if required.	02538
71.000	INSTALL SEWERS BY AUGERING BORING, MICROTUNNELLING, PIPE JACKING OR PIPE BURSTING		Measured between outside of driving or receiving pits	
71.001 71.002 71.003 71.004 71.005 71.006 71.007 71.008	By Augering/Boring Concrete Main Line Pipe 250 mm. diameter 300 mm. diameter 375 mm. diameter 450 mm. diameter 525 mm. diameter 600 mm. diameter 675 mm. diameter 750 mm. diameter	Lineal Metre	Supply, auguring or boring equipment; excavate and backfill pits; supply and install pipe; remove existing pipe; backfill and compact pits; restore surface; C.C.T.V. inspection; infiltration/exfiltration testing; water control and disposal; bypass pumping as required.	02445
71.020 71.021 71.022 71.023 71.024 71.025 71.026 71.027 71.028	PVC Main Line Pipe 200 mm. diameter 250 mm. diameter 300 mm. diameter 375 mm. diameter 450 mm. diameter 525 mm. diameter 600 mm. diameter 675 mm. diameter 750 mm. diameter			
71.041 71.042 71.043	Concrete C.B. Lead 250 mm. diameter 300 mm. diameter 375 mm. diameter			
71.061 71.062 71.063	PVC C.B. Lead 250 mm. diameter 300 mm. diameter 375 mm. diameter			
71.401 71.402 71.403 71.404 71.405 71.406 71.407 71.408 71.409 70.410	By Pipe Jacking Concrete Main Line Pipe 450 mm. diameter 525 mm. diameter 600 mm. diameter 675 mm. diameter 750 mm. diameter 900 mm. diameter 1050 mm. diameter 1200 mm. diameter 1350 mm. diameter 1500 mm. diameter and up	Lineal Metre	Supply, pipe jacking equipment; excavate and backfill pits; supply and install pipe; remove existing pipe; backfill and compact pits; restore surface; C.C.T.V. inspection; infiltration/exfiltration testing; water control and disposal; bypass pumping as required.	02426

No.	Item	Unit	Payment Includes	Ref.
71.601 71.602 71.603 71.604 71.605 71.606 71.607 71.608	By Pipe Bursting Concrete Main Line Pipe 300 mm diameter 375 mm diameter 450 mm. diameter 525 mm. diameter 600 mm. diameter 675 mm. diameter 750 mm. diameter 900 mm. diameter	Lineal Metre	Supply pipe bursting equipment; excavate and backfill pits; supply and install pipe; remove existing pipe; backfill and compact pits; restore surface; C.C.T.V. inspection; infiltration/exfiltration testing; water control and disposal; bypass pumping as required.	02955
71.621 71.622 71.623 71.624 71.625 71.626 71.627	PVC Main Line Pipe 300 mm diameter 375 mm diameter 450 mm. diameter 525 mm. diameter 600 mm. diameter 675 mm. diameter 750 mm. diameter			02445
71.641 71.642 71.643 71.644 71.645 71.646 71.647	High Density Polyethylene (HDPE) 300 mm diameter 375 mm diameter 450 mm. diameter 525 mm. diameter 600 mm. diameter 675 mm. diameter 750 mm. diameter			
71.801 71.802 71.803 71.804 71.805 71.806 71.807	By Microtunnelling Concrete Main Line Pipe 450 mm. diameter 525 mm. diameter 600 mm. diameter 675 mm. diameter 750 mm. diameter 900 mm. diameter 1050 mm. diameter	Lineal Metre	Supply microtunnelling equipment; excavate and backfill pits; supply and install pipe; remove existing pipe; backfill and compact pits; restore surface; C.C.T.V. inspection; infiltration/exfiltration testing; water control and disposal; bypass pumping as required.	02441
71.821 71.822 71.823 71.824 71.825 71.826	Fibreglass Reinforced Resin Main Line Pipe 450 mm. diameter 525 mm. diameter 600 mm. diameter 675 mm. diameter 750 mm. diameter 900 mm. diameter			
71.841 71.842 71.843 71.844 71.845	Steel Main Line Pipe 450 mm. diameter 500 mm. diameter 600 mm. diameter 750 mm. diameter 900 mm. diameter			

No.	Item	Unit	Payment Includes	Ref.
72.000	SEWAGE FORCE MAIN			
	Install by Trenching			
	Steel	Lineal Metre	Supply and install pipe; connect to manholes; C.C.T.V. inspection; infiltration/exfiltration testing; water control and disposal	02531 02535
72.001	150 mm. diameter			
72.002	200 mm. diameter			
72.003	250 mm. diameter			
72.004	300 mm. diameter			
72.005	450 mm. diameter			
	PVC			
72.021	150 mm. diameter			
72.022	200 mm. diameter			
72.023	250 mm. diameter			
72.024	300 mm. diameter			
72.025	450 mm. diameter			
	H.D. Polyethylene			
72.041	150 mm. diameter			
72.042	200 mm. diameter			
72.043	250 mm. diameter			
72.044	300 mm. diameter			
72.045	450 mm. diameter			
	By Augering/Boring			
	Steel	Lineal Metre	Supply auguring or boring equipment; excavate and backfill pits; supply and install pipe; backfill and compact pits; restore surface; C.C.T.V. inspection; infiltration/ exfiltration testing; water control and disposal.	02445 02531
72.201	150 mm. diameter			
72.202	200 mm. diameter			
72.203	250 mm. diameter			
72.204	300 mm. diameter			
72.205	450 mm. diameter			
	PVC			
72.221	150 mm. diameter			
72.222	200 mm. diameter			
72.223	250 mm. diameter			
72.224	300 mm. diameter			
72.225	450 mm. diameter			
	H.D. Polyethylene			
72.241	150 mm. diameter			
72.242	200 mm. diameter			
72.243	250 mm. diameter			
72.244	300 mm. diameter			
72.245	450 mm. diameter			

73.000	MANHOLES, C. B. MANHOLES CATCH BASINS AND SHAFTS		Measured from lowest pipe invert or top of structure to finished surface	
	Manholes			
73.001	1200 mm. diameter	Vertical Metre	Any additional excavation required outside of the trench; supply and install materials including T-riser, frame and cover; connect sewer or c.b. lead; bench; make water tight; adjust to final grade; supply imported backfill where necessary; additional work to backfill and compact around manhole; remove debris.	02631
73.002	1500 mm. diameter			
	Catch Basin Manholes			
73.101	900 mm. diameter	Vertical Metre	Any additional excavation required outside of the trench; supply and assemble materials (excluding frame and cover); connect lead pipe; adjusting to final grade; supply of imported backfill where necessary; additional work to backfill and compact around manhole; remove debris.	
73.102	1200 mm. diameter			

No.	Item	Unit	Payment Includes	Ref.
73.201 73.202	Catch Basins 525/600 mm. diameter 900 mm. diameter	Vertical Metre	Any additional excavation required outside of trench; assemble materials (excluding frame and inlet grate); connect lead pipe; adjust to final grade; supply of imported backfill where necessary; backfill and compact; dispose of surplus material; remove debris.	02631
73.301 73.302 73.303 73.304 73.305 73.306 73.307 73.308 73.309 73.410 73.411 73.412	Frame and Cover Type K-7 Type NF-80 Type NF-90 Type 2A Type 2 Type 4 Type 6 Type 7 Type 8 Type 6A Type F-51 Type F-51, c/w side inlet	Number	Supply and fit on top of catch basin or manhole; adjust to final grade.	
73.401 73.402	Adjust Manhole, Catch Basin Manhole or Catch Basin Up to 600 mm. vertically Over 600 mm. vertically	Number Vertical Metre	Supply and assemble materials; excavate; remove and reset frame and cover; install masonry to final grade; supply specified backfill material; backfill and compact; dispose of surplus material; clean catch basin or manhole of debris.	
73.501	Abandon Manhole, Catch Basin Manhole or Catch Basin	Number	Remove rings and blocks; cut or remove barrels; remove debris from site; supply, place and compact backfill; plug the lead. Where an abandoned catch basin or manhole is within an excavation and no backfilling, plugging or special work is required other than outright removal, no payment will be made for abandoning the catch basin or manhole which shall be deemed part of the excavation.	
73.601	Remove Frame and Cover	Number	Remove, load, transport and unload at a designated storage yard. Less deduction for damaged units at replacement cost.	
74.000	SEWER AND MANHOLE REHABILITATION	Measured between centre lines of manhole		
74.001 74.002 74.003 74.004 74.005 74.006 74.007 74.008 74.009 74.010	Clean Sewer Line and Cut Protruding Services up to 250mm diameter 300 mm diameter 375 mm diameter 450 mm diameter 525 mm diameter 600 mm diameter 675 mm diameter 750 mm diameter 900 mm diameter 1050 mm diameter and up	Lineal Metre	Review tapes and record drawings; inspect sewer by C.C.T.V. prior to starting work; record all deformations; design of the cleaning and rehabilitation scheme; bypass pumping as required; cut all protruding services; clean the sewer of debris Variable: Type and Condition of line	02953

No.	Item	Unit	Payment Includes	Ref.
74.101 74.102 74.103 74.104 74.105 74.106 74.107 74.108 74.109 74.010	Reline Sewer With Cast-in-Place Pipe (CIPP) Liner up to 250mm diameter 300 mm diameter 375 mm diameter 450 mm diameter 525 mm diameter 600 mm diameter 675 mm diameter 750 mm diameter 900 mm diameter 1050 mm diameter and up	Lineal Metre	Prepare sewers for accepting liner system, incl. flushing and cleaning; supply and install liner system; provide alternate sanitary services to homeowners; C.C.T.V. inspection; exfiltration testing; bypass pumping as required; reconnect existing services.	02957
74.201 74.202 74.203 74.204 74.205 74.206 74.207 74.208 74.209 74.210	With High Density Polyethylene Liner up to 250mm diameter 300 mm diameter 375 mm diameter 450 mm diameter 525 mm diameter 600 mm diameter 675 mm diameter 750 mm diameter 900 mm diameter 1050 mm diameter and up			
74.301 74.302 74.303 74.304 74.305 74.306 74.307 74.308 74.309 74.310	With Fold and Form Pipe up to 250mm diameter 300 mm diameter 375 mm diameter 450 mm diameter 525 mm diameter 600 mm diameter 675 mm diameter 750 mm diameter 900 mm diameter 1050 mm diameter and up			
74.401 74.402 74.403 74.404 74.405 74.406 74.407 74.408 74.409 74.410	Joint Grout Existing Concrete Sewers up to 250mm diameter 300 mm diameter 375 mm diameter 450 mm diameter 525 mm diameter 600 mm diameter 675 mm diameter 750 mm diameter 900 mm diameter 1050 mm diameter and up	Lineal Metre	Supply all materials and equipment for joint grouting; inspect, flush and clean lines; test joints; produce and maintain records of joints: exfiltration testing; bypass pumping as required.	02956
74.501 74.502 74.503 74.504 74.505 74.506 74.507 74.508 74.509 74.510	Spot Relining of Sewers up to 250mm diameter 300 mm diameter 375 mm diameter 450 mm diameter 525 mm diameter 600 mm diameter 675 mm diameter 750 mm diameter 900 mm diameter 1050 mm diameter and up	Lineal Metre	Test and CCTV existing sewers; prepare sewers for accepting liner system, including flushing and cleaning; supply and install liner system; provide alternate sanitary services as required; C.C.T.V. inspection; reconnect existing services; exfiltration testing; bypass pumping as required.	02957
			Variable: Condition of line and magnitude of repair	

No.	Item	Unit	Payment Includes	Ref.
74.601	Rehabilitate Manholes	Number	Supply all material and equipment; ventilate manhole during rehabilitation operation; clean manhole; remove existing benching; place new benching as detailed; seal pipe in manhole walls; supply and install pipe clean-out as required; grout manhole joints as required; apply exterior waterproofing; remove debris.	02631
75.000	TUNNELS AND UNDERGROUND STRUCTURES	Tunnels measured between outside of access and retrieval shafts.		
75.001 75.002 75.003 75.004 75.005 75.006 75.007 75.008	Tunnel Excavated by Machinery Cast-in-place 1.98 metre finished i.d. 2.13 metre finished i.d. 2.59 metre finished i.d. 3.05 metre finished i.d. 3.50 metre finished i.d. 3.66 metre finished i.d. 4.27 metre finished i.d. 4.88 metre finished i.d.	Lineal Metre	Supply tunnel boring machine, sequential excavation machinery, hoist, spoil removal devices and all other equipment required; supply and install all materials for temporary and permanent liners including segmental liners if appropriate; control ground water; additional access shafts required for access for equipment or power supply; ground stabilization if necessary; disposal of excavated material; concrete and joint finishing; infiltration testing; remove debris from tunnel and wash clean	02412 02415 02422
75.101 75.102	Segmental Liner 2.34 metre finished i.d. 2.92 metre finished i.d.	Lineal Metre		02427
75.200 75.201 75.202 75.203 75.204 75.205	Hand Tunnel 0.92 metre arch rib 1.22 metre arch rib 1.83 metre arch rib 1.68 metre oval 2.08 metre outside dia. 1.93 metre outside dia.	Lineal Metre	Supply all equipment and tools required; Supply and install all materials for temporary and permanent liners; control ground water; dispose of excavated material.	02412 02422
75.301	Grouting Voids Variable: Grout Strength and Grouting Pressure	Cubic Metre	Supply of grouting equipment; supply of cement grout to specified strengths; drill grout holes: mix and inject grout to agreed pressure; seal grout holes and finish.	02435
75.401	Stabilize Ground	Lump Sum	Supply of equipment and material required to stabilize or freeze ground ahead of tunnelling operations; design and implementation of approved ground stabilization scheme; monitor results; additional costs involved in the special disposal of excavated stabilized ground if necessary.	S.P.
75.501 75.502	Access Shaft Retrieval Shaft	Vertical Metre	Drill and/or excavate shaft to invert of tunnel; supply and install temporary Supports; dispose of excavated material; install permanent access structure on completion of tunnel; remove temporary supports; supply specified backfill material; backfill and compact to base of surface restoration; restore surface.	02444
75.601	Underground Concrete Structure	Lump Sum	Excavate for structure as detailed; place and level mud slab; supply and erect formwork, support structure and reinforcement; supply, place, vibrate, finish concrete; protect concrete whilst curing; strip and dismantle formwork and support structure; finish concrete; install access steps, ladders, covers and frames as required; supply and place granular surround if designated; water control and disposal; clean out and dispose of debris; inspect and test. Variable: Size and Depth of Installation to the designated limits on the drawing	03100 03210 03310

No.	Item	Unit	Payment Includes	Ref.
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76.000	CONCRETE BOX SEWERS			
	Precast Concrete Box Sewer			
	0 to 3.5 metres deep			
76.001	1200mm x 600mm.	Lineal Metre	Excavate; supply and install box sections; supply and place bedding and surround if required; supply and install joint sealant; supply and install insulation; backfill and compact; water control and disposal; clean out and dispose of debris; inspect and test.	02645
76.002	1200mm x 900mm.			
76.003	1800mm x 900mm.			
76.004	1800mm x 1200mm.			
76.005	2400mm x 1200mm.			
76.006	2400mm x 1500mm.			
76.007	2400mm x 1800mm.			
76.008	2400mm x 2400mm.			
76.009	3000mm x 1500mm.			
76.010	3000mm x 2400mm.			
	3.5 to 7.0 metres deep			
76.101	1200mm x 600mm.	Lineal Metre	Excavate; supply and install box sections; supply and place bedding and surround if required; supply and install joint sealant; supply and install insulation; backfill and compact; water control and disposal; clean out and dispose of debris; inspect and test.	02645
76.102	1200mm x 900mm.			
76.103	1800mm x 900mm.			
76.104	1800mm x 1200mm.			
76.105	2400mm x 1200mm.			
76.106	2400mm x 1500mm.			
76.107	2400mm x 1800mm.			
76.108	2400mm x 2400mm.			
76.109	3000mm x 1500mm.			
76.110	3000mm x 2400mm.			

LANDSCAPING

90.000	TOPSOIL			
90.010	Add Peat Moss	Cubic Metre	Supply, spread and mix with topsoil as required.	02910
90.020	Add Lime	Kilogram	Supply, spread and mix with topsoil as required.	
90.030	Place City Topsoil in bulk	Cubic Metre	Gain access to and uncover City stockpile; load and haul to site; correct minor irregularities in grade; remove weed, rocks, and foreign matter; prepare subsoil; spread, cultivate and compact topsoil; control dust.	
90.032	100 mm deep	Square Metre		
90.034	150 mm deep	Metre		
90.040	Supply and Place Topsoil in bulk	Cubic Metre	Topsoil analysis by an approved laboratory; supply topsoil to site; supply and mix additives if necessary; correct minor irregularities in grade; remove weed, rocks, and foreign matter; prepare subsoil, prepare subsoil, cut existing turf for even butt joint; spread, cultivate and compact topsoil; dust control.	
90.042	100 mm deep	Square Metre		
90.044	150 mm deep	Metre		

No.	Item	Unit	Payment Includes	Ref.
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91.000	SEED AND SOD			
91.010	Seeding	Square Metre	Remove and dispose of weeds and debris from topsoil; cultivate and roll seedbed; supply and spread seed and fertilizer; mulch seed slope protection where required; weed control; maintenance until acceptance.	02920
91.020	Hydroseeding	Square Metre	Remove and dispose of weeds and debris from topsoil; cultivate and roll seedbed; supply and spread seed and fertilizer; mixture with a hydroseeding machine; seed slope protection where required; weed control; maintenance until acceptance.	
91.030	Sodding	Square Metre	Remove and dispose of weeds and debris from topsoil; cultivate and roll sod bed; roll sod bed; supply and place; wire mesh, pegs and posts; supply and place sod and fertilizer; roll sod after laying; water; slope protection where required; weed control; maintenance until acceptance.	
91.040	Extra Seed Mix	Kilogram	Supply, spread and mulch seed mixture ordered in addition to the specified amount.	
91.050	Extra Fertilizer	Kilogram	Supply fertilizer ordered in addition to the specified amount; spread, and mix with topsoil where required.	

92.000	TREES, SHRUBS AND			
	Coniferous Evergreen Trees			02930
		Number	Remove and dispose of weeds and debris from topsoil; cultivate bed; supply and place tree and fertilizer; water; slope protection where required; weed control; maintenance until acceptance.	
92.001	Balsam fir (2.5 m ht.)			
92.002	Jack Pine (2.5 m ht.)			
92.003	Jack Pine (3.0 m ht.)			
92.004	Lodge pole pine (2.5 m ht.)			
92.005	Lodge pole pine (3.0 m ht.)			
92.006	Austrian pine (2.5 m ht.)			
92.007	Austrian pine (3.0 m ht.)			
92.008	Scots pine (2.5 m ht.)			
92.009	Scots pine (3.0 m ht.)			
92.010	Norway spruce (2.5 m ht.)			
92.011	Norway spruce (3.0 m ht.)			
92.012	White spruce (2.5 m ht.)			
92.013	White spruce (3.0 m ht.)			
	Colorado green spruce			
92.014	2.5 m ht.			
92.015	3.0 m ht.			
	Colorado blue spruce			
92.016	2.5 m ht.			
92.017	3.0 m ht.			
92.018	Tamarack (1.5 m ht.)			
92.019	Tamarack (2.5 m ht.)			
92.020	Siberian larch (1.5 m ht.)			
92.021	Siberian larch (2.5 m ht.)			

No.	Item	Unit	Payment Includes	Ref.
	Coniferous Evergreen Shrubs			
	Golden Pfitzer juniper	Number	Remove and dispose of weeds and debris from topsoil; cultivate bed; supply and place tree and fertilizer; water; slope protection where required; weed control; maintenance until acceptance.	02930
92.051	600 mm sp.			
92.052	750 mm sp.			
	Prince of Wales juniper			
92.053	600 mm sp.			
92.054	750 mm sp.			
92.055	Creeping juniper (600 mm sp.)			
92.056	sp.)			
92.057	Creeping juniper (750 mm sp.)			
92.058	sp.)			
	Andorra juniper (600 mm sp.)			
	Andorra juniper (750 mm sp.)			
	Compact Andorra juniper			
92.060	600 mm sp.			
92.061	750 mm sp.			
92.062	Savin juniper (600 mm sp.)			
92.063	Savin juniper (750 mm sp.)			
92.064	Arcadia juniper (600 mm sp.)			
92.065	Arcadia juniper (750 mm sp.)			
	Skandia juniper			
92.067	600 mm sp.			
92.068	750 mm sp.			
	Armstrong juniper			
92.070	600 mm sp.			
92.071	750 mm sp.			
92.072	Pfitzer juniper (600 mm sp.)			
92.073	Pfitzer juniper (750 mm sp.)			
	Japagarden juniper			
92.075	600 mm sp.			
	Calgary carpet juniper			
92.077	600 mm sp.			
92.078	750 mm sp.			
	Tamarix leaved juniper			
92.080	600 mm sp.			
92.081	750 mm sp.			
92.082	Mugo pine (600 mm ht.)			
92.083	Mugo pine (1.0 m sp.)			
	Compact mugo pine			
92.085	500 mm sp.			
	Dwarf mugo pine			
92.087	500 mm sp.			

No.	Item	Unit	Payment Includes	Ref.
	Deciduous Trees			
92.101	Black ash (60 mm cal.)	Number	Remove and dispose of weeds and debris from topsoil; cultivate bed; supply and place tree and fertilizer; water; slope protection where required; weed control; maintenance until acceptance.	02930
92.102	Black ash (75 mm cal.)			
92.103	Green ash (60 mm cal.)			
92.104	Green ash (75 mm cal.)			
	Patmore green ash			
92.106	60 mm cal.			
92.107	75 mm cal.			
	Fallgold black ash			
92.109	45 mm cal.			
92.110	60 mm cal.			
92.111	75 mm cal.			
92.112	Manchurian ash (60 mm cal.)			
92.113	Manchurian ash (75 mm cal.)			
92.114	Paper birch (60 mm cal.)			
	Young's weeping birch			
	50 mm cal.			
92.117	Multi stem birch			
	3 stems/2.5 m ht.			
92.119	Amur cherry (50 mm cal.)			
92.120	Amur cherry (60 mm cal.)			
92.121	May day tree (50 mm cal.)			
92.122	May day tree (60 mm cal.)			
92.123	Pincherry (45 mm cal.)			
92.124	Pincherry (50 mm cal.)			
	Western chokecherry			
92.126	45 mm cal.			
92.127	50 mm cal.			
92.128	60 mm cal.			
	Shubert chokecherry			
92.130	45 mm cal.			
92.131	50 mm cal.			
92.132	60 mm cal.			
	Siberian flowering crab			
92.134	45 mm cal.			
92.135	50 mm cal.			
	Thunderchild crabapple			
92.137	45 mm cal.			
92.138	50 mm cal.			
	Strathmore crabapple			
92.140	45 mm cal.			
92.141	50 mm cal.			
92.143	Red splendor crabapple			
	45 mm cal.			
92.145	Selkirk crabapple (45 mm cal.)			
92.147	Royalty crabapple (45 mm cal.)			

No.	Item	Unit	Payment Includes	Ref.
92.148	Japanese elm (60 mm cal.)	Number	Remove and dispose of weeds and debris from topsoil; cultivate bed; supply and place tree and fertilizer; water; slope protection where required; weed control; maintenance until acceptance.	02930
92.149	American elm (60 mm cal.)			
92.150	American elm (75 mm cal.)			
92.151	Brandon elm (60 mm cal.)			
92.152	Brandon elm (75 mm cal.)			
92.153	Brandon elm (100 mm cal.)			
92.154	Siberian elm (60 mm cal.)			
92.155	Manitoba maple (60 mm cal.)			
92.156	Manitoba maple (75 mm cal.)			
92.157	Silver maple (60 mm cal.)			
92.158	Silver maple (75 mm cal.)			
92.159	Bur oak (50 mm cal.)			
92.160	Bur oak (60 mm cal.)			
92.161	Russian olive (50 mm cal.)			
92.162	Russian olive (60 mm cal.)			
	Swedish columnar aspen			
92.164	3.0 m ht.			
92.165	60 mm cal.			
92.166	75 mm cal.			
	Brooks #6 poplar			
92.168	60 mm cal.			
92.169	75 mm cal.			
	Northwest poplar			
92.171	60 mm cal.			
92.172	75 mm cal.			
92.173	100 mm cal.			
92.174	Tower popular (60 mm cal.)			
92.175	Tower popular (75 mm cal.)			
92.176	Cottonwood (60 mm cal.)			
92.177	Cottonwood (75 mm cal.)			
92.178	Cottonwood (100 mm cal.)			
92.179	Trembling aspen (45 mm cal.)			
92.180	Japanese tree lilac			
92.181	60 mm cal.			
92.182	Hawthorn (2.0 m ht.)			
92.183	Trembling aspen (60 mm cal.)			
92.184	Trembling aspen (75 mm cal.)			
92.185	Laurel leaf willow (60 mm cal.)			
92.186	Laurel leaf willow (75 mm cal.)			
92.187	Sharp leaf willow (60 mm cal.)			
92.188	Sharp leaf willow (75 mm cal.)			
92.189	Golden willow (60 mm cal.)			
92.190	Golden willow (75 mm cal.)			
92.191	Basswood (60 mm cal.)			
92.192	Basswood (75 mm cal.)			
92.193	Little leaf linden (60 mm cal.)			
92.194	Little leaf linden (75 mm cal.)			
92.195	Chocolate hawthorn (2.0 m ht)			
92.201	Deciduous Shrubs Silver buffaloberry 600 mm ht.	Number	Remove and dispose of weeds and debris from topsoil; cultivate bed; supply and place shrub and fertilizer; water; slope protection where required; weed control; maintenance until acceptance.	02930
92.203	Tusset buffaloberry 450 mm ht.			
92.205	Sea buckthorn (600 mm ht.)			
92.206	Caragana (600 mm ht.)			
92.207	Pygmy caragana (450 mm ht.)			
92.208	Sandcherry (450 mm ht.)			

No.	Item	Unit	Payment Includes	Ref.
92.209	Western sandcherry 450mm ht.	Number	Remove and dispose of weeds and debris from topsoil; cultivate bed; supply and place shrub and fertilizer; water; slope protection where required; weed control; maintenance until acceptance.	02930
92.211	Mongolian cherry 500 mm ht.			
92.213	Purple leaved sandcherry 450 mm ht.			
92.215	Russian almond (450 mm ht.)			
92.216	Double flowering plum 600 mm ht.			
92.218	Flowering plum (600 mm ht.) Shrubby cinquefoil			
92.220	450 mm ht.			
92.221	600 mm ht. Abbotswood potentilla			
92.223	450 mm ht.			
92.224	600 mm ht.			
92.225	Farreri potentilla (450 mm ht.) Jackman's potentilla			
92.227	450 mm ht.			
92.228	600 mm ht.			
92.230	Forestii potentilla 600 mm ht.			
92.231	European cotoneaster 600 mm ht. Highbush cranberry			
92.234	600 mm ht.			
92.235	1.0 m ht.			
92.236	Dwarf Highbush cranberry 1.0 m ht.			
92.238	Gary Pink' – American highbush cranberry 750 mm ht.			
92.241	Alpine currant 450 mm ht.			
92.242	600 mm ht.			
92.243	750 mm ht.			
92.244	Red osier dogwood 600 mm ht.			
92.246	Golden twig dogwood 600 mm ht.			
92.248	Siberian coral dogwood 600 mm ht.			
92.250	Argeto-marginata' tatarian Dogwood (750 mm ht.) Japanese tree lilac			
92.253	600 mm ht.			
92.254	750 mm ht.			
92.255	Late lilac (600 mm ht.) Common lilac			
92.256	600 mm ht.			
92.257	1.0 m ht. Amur maple			
92.258	1.0 m ht.			
92.259	1.5 m ht.			
92.260	Common ninebark (600 mm ht.)			
92.262	Golden ninebark (600 mm ht)			

No.	Item	Unit	Payment Includes	Ref.
92.263	Saskatoon	Number	Remove and dispose of weeds and debris from topsoil; cultivate bed; supply and place shrub and fertilizer; water; slope protection where required; weed control; maintenance until acceptance.	02930
92.264	600 mm ht.			
92.265	1.0 m ht.			
	1.5 m ht.			
	Froebel's spirea			
92.266	450 mm ht.			
92.267	600 mm ht.			
	Three lobed spirea			
92.269	450 mm ht.			
92.270	600 mm ht.			
92.271	750 mm ht.			
	Wolf willow			
92.272	600 mm ht.			
92.273	750 mm ht.			
92.274	Snowberry (450 mm ht.)			
92.275	Virginia creeper (2 years old)			
	Roses			
92.301	Common wild rose (600 mm ht.)			
92.303	Prickly rose (600 mm ht.)			
92.304	Chuthbert grant rose			
	450 mm ht.			
92.306	Smooth rose (600 mm ht.)			
92.307	Betty bland smooth rose			
	600 mm ht.			
92.308	Hansa rose (600 mm ht.)			
92.309	David Thompson rose			
	600 mm ht.			
92.310	Sunshine rose (600 mm ht.)			
92.311	Prickly rose (600 mm ht.)			
	Perennials			
92.351	Day lilies (300 mm ht.)			
92.352	Perennial phlox (300 mm ht.)			
92.353	Sweet william phlox			
	200 mm ht.			
	Common Annuals			
92.361	Geranium (5" pot)			
92.362	Marigold (pot/flats.)			
	Rooted Cuttings			
92.371	Red-osier dogwood(1gal.pot)			
92.372	Common wild rose(1gal.pot)			
92.373	Green alder (1 gal. pot)			
92.374	Beaked willow (1 gal. pot)			
92.375	Balsom poplar (1 gal. pot)			

No.	Item	Unit	Payment Includes	Ref.
94.000	CHAIN LINK FENCE			
94.010	Install Chain Link Fence 1.5 metre high	Lineal Metre	Supply materials (including barbed wire overhang if specified); excavate post holes; set to line and level; concrete in position; adjust fence tension; alter ground levels at fence to close gaps; restore surface at post holes.	02821
94.020	1.8 metre high			
94.030	2.1 metre high			
94.040	2.4 metre high			
	Install Chain Link Fence plus Barbed Wire			
94.110	1.5 metre high	Number	Supply gates and gate posts (including barbed wire overhang, hold-back restraint if specified; excavate gatepost holes; set to line and level; concrete gatepost holes; set gaps due to uneven finished surface elevation; restore surface at gatepost holes).	
94.120	1.8 metre high			
94.130	2.1 metre high			
	Install Single Gate			
94.210	1.5 metre high			
94.220	1.8 metre high			
94.230	2.1 metre high			
94.240	2.4 metre high			
	Install Single Gate plus Barbed Wire			
94.310	1.5 metre high			Number
94.320	1.8 metre high			
94.330	2.1 metre high			
	Install Double Gate			
94.410	1.5 metre high			
94.420	1.8 metre high			
94.430	2.1 metre high			
94.440	2.4 metre high			
	Install Double Gate plus Barbed Wire			
94.510	1.5 metre high			
94.520	1.8 metre high			
94.530	2.1 metre high			

END OF SECTION

1.1 CONSTRUCTION SCHEDULE**1.1.1 Requirements**

One week prior to commencing construction submit a detailed construction progress schedule to the Engineer.

1.1.2 Format

1.1.2.1 Prepare schedule in the form of a horizontal bar chart.

1.1.2.2 Provide a separate bar for each operation.

1.1.2.3 Provide horizontal time scale identifying the first day of the week.

1.1.3 Submittals

1.1.3.1 Submit initial schedules within 15 working days after award of contract.

1.1.3.2 Submit four copies. The Engineer will retain three copies.

1.1.3.3 Engineer will review schedule and return one reviewed copy within 10 working days after receipt.

1.1.3.4 Resubmit finalized schedule within five working days after receipt.

1.1.3.5 Submit revised progress schedule when requested by the Engineer.

1.1.4 Construction Progress Schedule

1.1.4.1 Include the completion sequence of construction activities.

1.1.4.2 Include the dates for the commencement and completion of each major element of construction.

1.1.4.3 Progress shall be reviewed at scheduled meetings.

1.2 PRE-CONSTRUCTION MEETINGS

1.2.1 The Engineer will arrange pre-construction meetings after the Contract is awarded.

1.2.2 Meetings will be held at the Engineer's office or at an alternate location at or near the site.

1.3 PROGRESS MEETINGS

1.3.1 Progress meetings will be held on a regular weekly basis or more frequently if requested by the Engineer.

1.3.2 The Contractor is to provide accommodation for progress meetings at or near the site.

1.3.3 The Engineer will give all parties advance notice of meeting dates, times and locations.

1.3.4 The Contractor shall have in attendance the Superintendent, the Project Manager and representatives of the subcontractors if requested by the Engineer.

1.3.5 The Engineer will have the Project Manager or the Resident Engineer in attendance.

1.3.6 The Engineer will take minutes and copies will be distributed to attendees.

END OF SECTION

1.1 SECTION INCLUDES

- 1.1.1 List of items that the Contractor shall submit or provide at the designated time to the authorized recipient.
- 1.1.2 Shop drawings.
- 1.1.3 Consult each specification section for more detailed requirements.

1.2 SUBMITTALS

The term days in this table refers to working days. Sections up to and including 0360 are in Volume 2 Roadways. Sections 02620 and 02640 are in Volume 3 Drainage whilst 02910 and 02920 are in Volume 5 Landscaping.

Section: Paragraph	Item	When	To Whom
02060:			
1.3.1	Weigh scale certificates	Prior to contract first production and as requested	Engineer
1.3.2	Weigh ticket for each load of aggregate	On delivery	Engineer
02065:			
1.4.1	Refinery data on asphalt cement (AC) with temperature-viscosity charts	With mix design and as requested	Engineering Services
1.4.2	AC mix design (Marshall) for each mix type and for each change in supplier and material source	10 days prior to AC production	Engineering Services
1.4.2.2	Mineral filler mill tests	With mix design and as requested	Engineering Services
1.4.3	Plant scale certificates	Prior to contract first production and as required	Engineering Services
1.4.4	Quality control plan	Prior to contract first production	Engineering Services
1.4.5	Aggregate sieve analysis and other tests	With mix design and during production	Engineering Services
1.4.6	Job-mix formula	With mix design	Engineering Services
02713:			
1.4.1.1	Soil cement mix design	7 days prior to production	Engineering Services
1.4.1.2	Aggregate sieve analysis	With mix design	Engineering Services
1.4.2	Job-mix formula	7 days prior to production	Engineering Services
02781:			
1.3.1	Manufacturer's data and brick paver samples	14 days prior to delivery	Engineer
1.3.2	Gradation and source of bedding and joint sand	7 days prior to delivery	Engineering Services

Section: Paragraph	Item	When	To Whom
02783:			
1.3.1	Manufacturer's data and concrete paver samples	14 days prior to delivery	Engineer
1.3.2	Gradation and source of bedding and joint sand	7 days prior to use	Engineering Services
02841:			
1.3.1	Precast concrete mix design for barrier and minibarrier	14 days prior to delivery	Engineer
02963:			
1.2.1	Refinery data on liquid asphalt for each type and source	Prior to contract first use and as requested	Engineering Services
02975:			
1.2.1	Manufacturer's data on sealant	7 days prior to use	Engineering Services
03055			
1.3.1	Portland cement mill tests	Once a month	Engineering Services
1.3.2	Fly ash mill tests	Once a month	Engineering Services
03060			
1.3.1	Petrographic analysis of aggregates	With mix design	Engineering Services
1.3.2	Ironstone content in aggregates	Weekly during production	Engineering Services
1.3.3	Tests on concrete with fly ash	With mix design	Engineering Services
1.3.4	Initial concrete mix design for each class	14 days prior to contract start	Engineering Services
1.3.5	Mix design for change in material, source, or proportioning	3 days prior to production	Engineering Services
02620			
2.1.1 2.1.3	Manufacturer's data on drain pipe and geotextile	7 days prior to use	Engineering Services
02640			
2.1.1	Manufacturer's data on corrugated steel pipe	7 days prior to use	Engineering Services
02910			
2.1.2.2	Analysis of topsoil supplied by Contractor	21 days prior to delivery	Engineer
02920			
2.1.1 to 2.1.3	Manufacturer's data on seed and fertilizer	14 days prior to use	Engineer

1.3 SHOP DRAWINGS**1.3.1 General**

- 1.3.1.1** The Contractor shall submit shop drawings to ensure that the specified products are furnished and installed in accordance with the design intent.
- 1.3.1.2** Until submissions are reviewed, work involving relevant products may not proceed.
- 1.3.1.3** Where the phrase "or equal", "or approved equal", "or approved alternative" and "or equal as approved by the Engineer" occurs in the Contract Documents, do not assume that material, equipment or methods will be accepted as equal by the Engineer, unless the item has been specifically accepted for this Work by the Engineer in writing.
- 1.3.1.4** In general, submissions shall be in accordance with the Alberta Standard Guide for Shop Drawings and Submittal Procedures - A.C.A. Document E 1986 - Alberta Construction Association.
- 1.3.1.5** All shop drawings shall be accurately drawn to a scale sufficiently large to show all pertinent features of the item and its method of connection to the work.
- 1.3.1.6** All shop drawings shall be sealed and signed by a Professional Engineer registered in Alberta.
- 1.3.1.7** Unless otherwise specifically directed by the Engineer, make all shop drawing prints in blue or black line on white background.
- 1.3.1.8** Submit six copies of all shop drawings.
- 1.3.1.9** Resubmissions of shop drawings shall be clearly identified. The revisions being resubmitted shall be marked or flagged on the drawings and it shall be the Contractor's responsibility to identify and mark all revisions from the original submission.

1.3.2 Identification

- 1.3.2.1** Completely identify each submission and resubmission of shop drawings by clearly showing:
- Name and address of submitter, plus name and phone number of contact person for further information.
 - Date of transmittal.
 - Name and address of recipient.
 - Project title.
 - Purpose - for action, information, review or resubmission.
 - Drawing number and specifications to which the submission applies.
 - Listing of enclosures or attachments.
 - Signature of person responsible for transmittal.

1.3.3 Coordination

- 1.3.3.1** Prior to submission for Engineer's review, use all means necessary to fully coordinate all material, including the following procedures:
- Determine and verify all field dimensions and conditions, materials, catalogue numbers and similar data.
 - Coordinate as required with all trades and with all public agencies involved.
 - Secure all necessary approvals from public agencies and other and signify by stamp, or other means that they have been secured.
 - Clearly indicate all deviations from the Contract Documents.

1.3.4 Timing

- 1.3.4.1** Make all submissions far enough in advance of scheduled dates of installation to provide all required time for reviews, for securing necessary approvals, for possible revisions and resubmittal and for placing orders and securing delivery.
- 1.3.4.2** In scheduling, allow at least ten working days for the Engineer's review following receipt of the submittal.
- 1.3.4.3** Costs of delays occasioned by tardiness of submittals will not be borne by the City.

END OF SECTION

1.1 SECTION INCLUDES:

Definitions and references to established standards common to all sections of the Construction Specifications.

1.2 DEFINITIONS

1.2.1 Engineer: is the person authorized by the City or the Developer, under the contract with the Contractor, to enforce the Construction Specifications and includes individuals authorized by the Engineer to perform on her or his behalf any of the Engineer's functions

1.2.2 Quality Control - a program of testing and inspection that will ensure or prove conformance of the Contractor's mix designs, products and workmanship to specified requirements. The Contractor is responsible for implementing this program. The Contractor may engage a qualified laboratory to perform quality control, or may use their own facilities subject to acceptance by the Engineer.

1.2.3 Quality Assurance Laboratory - is the Engineering Services Section, Roadways Engineering Branch, Transportation and Streets Department, or other qualified laboratory designated by the City to perform quality assurance testing and inspection to determine acceptability of the Contractor's work and materials.

1.2.4 Qualified Laboratory - a laboratory practising under the Engineering, Geological and Geophysical Professions Act of Alberta and having the expertise and facilities to perform the specified mix design or testing.

1.3 ORGANIZATIONS ISSUING THE STANDARDS

1.3.1 In the reference to a standard, the following acronyms or abbreviations are used to denote the organization that issues that standard.

1.3.1.1 General

AASHTO	American Association of State Highway and Transportation Officials
ACI	American Concrete Institute
ACPA	American Concrete Pipe Association
AI	Asphalt Institute
AISC	American Institute of Steel Construction
AISI	American Iron and Steel Institute
ARCA	Alberta Roofing Contractors Association
ASA	American Standards Association
ASCE	American Society of Civil Engineers
ASTM	American Society for Testing and Materials
AWPA	American Wood Preservers Association
AWS	American Welding Society
BCLMA	B.C. Lumber Manufacturer's Association
CAN	National Standard of Canada
CCA	Canadian Construction Association
CGSB	Canadian General Standards Board
CISC	Canadian Institute of Steel Construction
CITC	Canadian Institute of Timber Construction
CNTA	Canadian Nurseries Tree Association
CPCI	Canadian Prestressed Concrete Institute
CRCA	Canadian Roofing Contractors Association
CRSI	Concrete Reinforcing Steel Institute
CSA	Canadian Standards Association
CWB	Canadian Welding Bureau

FCCHR of the USC	Foundation for Cross Connection Control and Hydraulic Research of the University of Southern California
ISO	International Organization for Standardization
LANTA	Landscape Alberta Nursery Trades Association
NBC	National Building Code
NSF	National Sanitation Foundation
PCA	Portland Cement Association
PCI	Prestressed Concrete Institute
PMBC	Plywood Manufacturer's Association
PPI	Plastic Pipe Institute
SJI	Steel Joist Institute
SSPC	Steel Structures Painting Council
TAC	Transportation Association of Canada
WCB	Worker's Compensation Board

1.3.1.2 Utilities

API	American Petroleum Institute
AWWA	American Water Works Association
CGA	Canadian Gas Association
CSPI	Corrugated Steel Pipe Institute
IAO	Insurer's Advisory Organization
ULC	Underwriters Laboratories of Canada
USA	United States of America Standards (ASA)

1.3.1.3 Mechanical

AFBMA	Anti Friction Bearing Manufacturer's Association
AGMA	American Gear Manufacturer's Association
AMCA	Air Moving and Conditioning Association
ANSI	American National Standards Institute
ACR	Air Conditioning and Refrigeration Institute
ASHRAE	American Society of Heating Refrigerating and Air Conditioning Engineers
NFPA	National Fire Protection Association

1.3.1.4 Electrical

SAE	Society of Automotive Engineers Electrical
AIEE	American Institute of Electrical Engineers
CEC	Canadian Electrical Code
CEMA	Canadian Electrical Manufacturer's Association
EEMAC	Electrical and Electronic Manufacturer's Association of Canada
IEC	International Electrotechnical Commission
IEEE	Institute of Electrical and Electronic Engineers
IES	Illuminating Engineers Society
IPCEA	Insulated Power Cable Engineer's Association
LEMA	Lighting Equipment Manufacturer's Association
NEC	National Electrical Code
NEMA	National Electrical Manufacturers Association
NESC	National Electrical Safety Code

1.3.2 Alphanumeric designations following the abbreviations denote the specification, method, or standard.

1.4 STANDARDS

1.4.1 References to standards, manuals or guides through out the specification are to the latest editions of those documents at the time a tender is advertised. It is the Contractor's responsibility to ensure that they possess all of the information from the correct edition.

1.4.2 **Soils** - testing of soils shall conform to the following standards:

ASTM D422	Test Method for Particle-Size Analysis of Soils
ASTM D698	Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft ³ (600 kN-m/m ³))
ASTM D1556	Test Method for Density and Unit Weight of Soil in Place by the Sand-Cone Method
ASTM D2167	Test Method for Density and Unit Weight of Soil in Place by the Rubber Balloon Method
ASTM D2922	Test Methods for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth)
ASTM D3017	Test Method for Water Content of Soil and Rock in Place by Nuclear Methods (Shallow Depth)
ASTM D4318	Test Method for Liquid Limit, Plastic Limit, and Plasticity Index of Soils

1.4.3 **Aggregates** - tests on aggregates shall conform to the following standards:

CAN/CGSB-8.2-M	Sieves, Testing, Woven Wire, Metric
ASTM C136	Test Method for Sieve Analysis of Fine and Coarse Aggregates

1.4.4 **Soil cement** - tests on soil cement shall conform to the following standards:

ASTM D558	Test Methods for Moisture-Density Relations of Soil-Cement Mixtures
ASTM D1556	Test Method for Density and Unit Weight of Soil in Place by the Sand-Cone Method
ASTM D1632	Practice for Making and Curing Soil-Cement Compression and Flexure Test Specimens in the Laboratory
ASTM D1633	Test Method for Compressive Strength of Molded Soil-Cement Cylinders
ASTM D2167	Test Method for Density and Unit Weight of Soil in Place by the Rubber Balloon Method
ASTM D2922	Test Methods for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth)
ASTM D3017	Test Method for Water Content of Soil and Rock in Place by Nuclear Methods (Shallow Depth)
Soil-Cement Laboratory Handbook	"Short-Cut Test Procedures for Sandy Soils", Method B – Chapter 6

1.4.5 Asphalt

1.4.5.1 **Asphalt cement** - tests on asphalt cement shall conform to the following standards:

ASTM D5	Test Method for Penetration of Bituminous Materials
ASTM D92	Test Method for Flash and Fire Points by Cleveland Open Cup
ASTM D113	Test Method for Ductility of Bituminous Materials
ASTM D1754	Test Method for Effects of Heat and Air on Asphaltic Materials (Thin-Film Oven Test)
ASTM D2042	Test Method for Solubility of Asphalt Materials in Trichloroethylene
ASTM D2170	Test Method for Kinematic Viscosity of Asphalts (Bitumens)
ASTM D2171	Test Method for Viscosity of Asphalts by Vacuum Capillary Viscometer

1.4.5.2 Asphalt concrete - the mix design, production and testing of asphalt concrete mixtures shall conform to the following standards:

Manual Series No. 2 (MS-2)	Mix Design Methods For Asphalt Concrete and Other Hot Mix Types (Marshall Method)
ASTM D995	Specification for Mixing Plants for Hot-Mixed, Hot-Laid Bituminous Paving Mixtures
ASTM D5581	Test Method for Resistance to Plastic Flow of Bituminous Mixtures Using Marshall Apparatus (6-Inch Diameter Specimen)

1.4.5.3 Asphalt paving - the following publications from the Asphalt Institute will serve as guides for good practice in asphalt hot-mix production and paving:

Manual Series No. 3 (MS-3)	Asphalt Plant Manual
Manual Series No. 8 (MS-8)	Asphalt Paving Manual

1.4.5.4 Crack sealant - shall conform to the following standards:

ASTM D1190	Specification for Concrete Joint Sealer, Hot-Poured Elastic Type.
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1.4.5.5 Slurry Seal: - shall conform to the following standards:

ASTM D244	Test Methods for Emulsified Asphalts
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1.4.6 Concrete - the mix design, production, placement and testing of Portland cement concrete shall conform to the following standards:

CAN/CSA-A5	Portland Cement (Included in CSA-A3000)
CAN/CSA-A8	Masonry Cement (Included in CSA-A3000)
CSA-A23.1	Concrete Materials and Methods of Concrete Construction
CSA-A23.2	Methods of Test for Concrete.
CSA-A23.2-1C	Sampling Plastic Concrete
CSA-A23.2-3C	Making and Curing Concrete Compression and Flexural Test Specimens
CSA-A23.2-4C	Air Content of Plastic Concrete by the Pressure Method
CSA-A23.2-5C	Slump of Concrete
CSA-A23.2-6C	Density, Yield, and Cementing Materials Factor of Plastic Concrete
CSA-A23.2-9C	Compressive Strength of Cylindrical Concrete Specimens
CSA-A23.2-14C	Obtaining and Testing Drilled Cores for Compressive Strength Testing
CSA-A23.3	Design of Concrete Structures
CSA-A23.4	Precast Concrete - Materials and Construction
CSA-A23.5	Supplementary Cementing Materials (Included in CSA-A3000)
CAN3-A23.7	Material Constituents
CAN/CSA-A257.4	Precast Reinforced Circular Concrete Manhole Sections, Catch Basins, and Fittings
CSA-A3000	Cementitious Materials Compendium
CSA-G30.3	Cold-Drawn Steel Wire for Concrete Reinforcement
CSA-G30.5	Welded Steel Wire Fabric for Concrete Reinforcement.
CAN/CSA-G30.18	Billet-Steel Bars for Concrete Reinforcement.
CSA-G40.21	Structural Quality Steels
CSA-S269.1	Falsework for Construction Purposes
CAN/CSA-S269.3	Concrete Formwork

ASTM C309	Specification for Liquid Membrane-Forming Compounds for Curing Concrete
ASTM C457	Test Method for Microscopical Determination of Parameters of the Air-Void System in Hardened Concrete
ASTM C979	Specification for Pigments for Integrally Colored Concrete
ASTM D1190	Specification for Concrete Joint Sealer, Hot-Poured Elastic Type.
ASTM D1751	Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types)
ASTM D3963/D3963M	Specification for Epoxy-Coated Reinforcing Steel
CRSI	CRSI Manual of Standard Practice

1.4.7 Unit Pavers

1.4.7.1 Concrete pavers - shall conform to the following standard:

ASTM C936	Specification for Solid Concrete Interlocking Paving Units
CSA-A231.2	Precast Concrete Pavers

1.4.7.2 Paving brick - shall conform to the following standards:

ASTM C902	Specification for Pedestrian and Light Traffic Paving Brick
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1.4.8 Metal

1.4.8.1 Chain link fence - shall conform to the following standards:

CAN/CGSB-138.1	Fabric for Chain Link Fence
CAN/CGSB-138.2	Steel Framework for Chain Link Fence
CGSB 1-GP-178M	Zinc Pigmented Paint.
ASTM A53	Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated Welded and Seamless
ASTM A121	Specification for Zinc-Coated (Galvanized) Steel Barbed Wire

1.4.8.2 Box beam guard rail - shall conform to the following standards:

CSA-W47.1	Certification of Companies for Fusion Welding of Steel Structures
CSA-W59-M	Welded Steel Construction (Middle Arc Welding)
ASTM A36/A36M	Specification for Carbon Structural Steel
ASTM A123/A123M	Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products
ASTM A325M	Specification for High-Strength Bolts for Structural Steel Joints (Metric)
ASTM A501	Specification for Hot-Formed Welded and Seamless Carbon Steel Structural Tubing

1.4.9 Sewers - manufactured products used in the construction of sewers shall conform to the following standards:

CAN/CSA-A5	Portland Cement (Included in CSA-A3000)
CAN/CSA-A257 Series	Standards for Concrete Pipe
CAN/CSA-A257.0	Methods for Determining Physical Properties of Circular Pipe, Manhole Sections, Catch Basins, and Fittings
CAN/CSA-A257.1	Circular Concrete Culvert, Storm Drain, Sewer Pipe, and Fittings
CAN/CSA-A257.2	Reinforced Circular Concrete Culvert, Storm Drain, Sewer Pipe, and Fittings

CAN/CSA-A257.3	Joints for Circular Concrete Sewer and Culvert Pipe, Manhole Sections, and Fittings Using Rubber Gaskets
CAN/CSA-A257.4	Precast Reinforced Circular Concrete Manhole Sections, Catch Basins, and Fittings
CSA-A3000	Cementitious Materials Compendium
CSA-B182.2	PVC Sewer Pipe and Fittings (PSM Type)
CSA-B182.4	Profile PVC Sewer Pipe and Fittings
ASTM A48	Specification for Gray Iron Castings
ASTM A536	Specification for Ductile Iron Castings

1.4.10 Corrugated steel pipe - shall conform to the following standard:

CSA-G401	Corrugated Steel Pipe Products
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1.4.11 Water mains and fittings - shall conform to the following standards:

AWWA C104	American National Standard for Cement-Mortar Lining for Ductile-Iron Pipe and Fittings for Water
AWWA C105	American National Standard for Polyethylene Encasement for Ductile-Iron Pipe Systems
AWWA C110	American National Standard for Ductile-Iron and Gray-Iron Fittings, 3 In. Through 48 In. (75mm Through 1200mm), for Water and Other Liquids
AWWA C111	American National Standard for Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings
AWWA C151	American National Standard for Ductile-Iron Pipe, Centrifugally Cast, for Water and Other Liquids
AWWA C200	AWWA Standard for Steel Water Pipe - 6 In. (150mm) and Larger
AWWA C207	AWWA Standard for Steel Pipe Flanges for Waterworks Service - Sizes 4 In. Through 144 In. (100mm Through 3600mm)
AWWA C208	AWWA Standard for Dimensions for Fabricated Steel Water Pipe Fittings
AWWA C209	AWWA Standard for Cold-Applied Tape Coatings for the Exterior of Special Sections, Connections, and Fittings for Steel Water Pipelines
AWWA C210	AWWA Standard for Liquid-Epoxy Coating Systems for the Interior and Exterior of Steel Water Pipelines
AWWA C213	AWWA Standard for Fusion-Bonded Epoxy Coating for the Interior and Exterior of Steel Water Pipelines
AWWA C214	AWWA Standard for Tape Coating Systems for the Exterior of Steel Water Pipelines
AWWA C219	AWWA Standard for Bolted, Sleeve-Type Couplings for Plain End Pipe
AWWA C301	AWWA Standard for Prestressed Concrete Pressure Pipe, Steel-Cylinder Type, for Water and Other Liquids
AWWA C303	AWWA Standard for Concrete Pressure Pipe, Bar-Wrapped, Steel-Cylinder Type
AWWA C500	AWWA Standard for Metal-Seated Gate Valves for Water Supply Service
AWWA C502	AWWA Standard for Dry-Barrel Fire Hydrants
AWWA C504	AWWA Standard for Rubber-Seated Butterfly Valves
AWWA C509	AWWA Standard for Resilient-Seated Gate Valves for Water Supply Service

AWWA C900	AWWA Standard for Polyvinyl Chloride (PVC) Pressure Pipe, 4 In. Through 12 In. (100 mm Through 300 mm), for Water Distribution
AWWA C905	AWWA Standard for Polyvinyl Chloride (PVC) Pressure Pipe and Fabricated Fittings, 14 In. Through 48 In. (350 mm Through 1,200 mm), for Water Transmission and Distribution
AWWA C907	AWWA Standard for Polyvinyl Chloride (PVC) Pressure Fittings for Water - 4 In. Through 8 In. (100 mm Through 200 mm)
CSA-B137.3	Rigid Polyvinyl Chloride (PVC) Pipe for Pressure Applications
CSA-C22.2 No. 38	Thermoset Insulated Wires and Cables
ASTM A105/A105M	Specification for Carbon Steel Forgings for Piping Applications
ASTM A307	Specification for Carbon Steel Bolts and Studs, 60 000 PSI Tensile Strength
ASTM B418	Specification for Cast and Wrought Galvanic Zinc Anodes
ASTM G57	Test Method for Field Measurement of Soil Resistivity Using the Wenner Four-Electrode Method
ASTM G97	Test Method for Laboratory Evaluation of Magnesium Sacrificial Anode Test Specimens for Underground Applications

1.4.12 Pavement Marking

1.4.12.1 Pavement marking material - shall conform to the following standard:

CGSB 1-GP-12.C	Standard Paint Colours
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1.4.12.2 Pavement marking material testing- shall conform to the following standards:

ASTM D256	Test Methods for Impact Resistance of Plastics and Electrical Insulating Materials
ASTM D523	Test Method for Gloss
ASTM D570	Test Method for Water Absorption of Plastics
ASTM D638	Test Method for Tensile Strength and Elongation
ASTM D638-68	Test Method for Adhesion Shear Strength
ASTM D713	Method for Conducting Road Service Tests on Traffic Paint
ASTM D821	Method of Evaluating Degree of Abrasion, Erosion, or a Combination of Both, in Road Service Tests of Traffic Paint
ASTM D868	Method of Evaluating Degree of Bleeding of Traffic Paint
ASTM D913	Method of Evaluating Degree of Resistance to Wear of Traffic Paint
ASTM D969	Method of Laboratory Test for Degree of Bleeding of Traffic Paint
ASTM D1214	Test Method for Sieve Analysis for Glass Spheres
ASTM D4060	Test Method for Abrasion Resistance of Organic Coatings by Taber Abrasion
ASTM E28	Test Method for Softening Point by Ring and Ball Apparatus
ASTM E303	Test Method for Skid Resistance
ASTM E1347	Test Method for Directional Reflectance Factor, 45° 0°, of Opaque Specimens by Broad-Band Filter Reflectometry
ASTM S1394	Method of Chemical Analysis of White Titanium Pigments
CGSB 1-GP-71	Methods of Testing Paints and Pigments
CGSB 1-GP-71 Method 49.1	Test Method for Index of Refraction on Glass Beads
Federal Test Method Standard No. 141a (Method 6192)	Test Method for Abrasion Resistance
Federal Test Method Standard 370	Test Method for Retroreflectivity

END OF SECTION

1.1 SECTION INCLUDES

- 1.1.1 Quality assurance inspection and testing by the Engineer.
- 1.1.2 Facilities for inspection and testing.

1.2 QUALITY ASSURANCE INSPECTION AND TESTING

- 1.2.1 The Engineer will conduct inspections, either on site or in the plant or both and the quality assurance laboratory will perform testing to establish the acceptability of the Contractor's products and workmanship as specified in the individual sections.
- 1.2.2 The Engineering Services Section of the Transportation and Streets Department, or any qualified laboratory designated by the City, will conduct quality assurance testing and plant inspection where necessary.
- 1.2.3 Quality assurance inspection and testing do not relieve the Contractor of the responsibility to supply products and perform the work in accordance with the specifications.
- 1.2.4 Testing will be in accordance with the relevant standards as set out in Section 01420 – Definitions and Standards.
- 1.2.5 Weekly summaries of test results will be provided to the Contractor at the Engineer's discretion.

1.3 FACILITIES FOR INSPECTION AND TESTING

- 1.3.1 Cooperate with the Engineer and facilitate the conduct of inspections and testing.
- 1.3.2 Notify the Engineer sufficiently in advance of operations to allow for inspection.
- 1.3.3 Provide safe access to work to be inspected and tested.
- 1.3.4 Make good work that is disturbed by inspection and tests.
- 1.3.5 Provide storage on site for the testing laboratory's exclusive use to store equipment and cure test samples.

END OF SECTION

1.1 SECTION INCLUDES

Quality control inspection and testing by the Contractor.

1.2 QUALITY CONTROL INSPECTION AND TESTING

- 1.2.1** The Contractor is responsible for carrying out at the Contractor's expense an adequate inspection and testing program to ensure or provide evidence that their mix designs, products and workmanship conform to requirements as specified in the individual sections.
- 1.2.2** The Contractor is also responsible for inspection and testing required by laws, ordinances, rules, regulations, or orders of public authorities.
- 1.2.3** To perform the testing, the Contractor may engage the services of a qualified laboratory, or may use the Contractor's own qualified staff and facilities subject to the Engineer's approval.
- 1.2.4** Testing shall be in accordance with the relevant standards as set out in Section 01420 – Definitions and Standards.
- 1.2.5** The Contractor shall provide copies of test results promptly to the Engineer.
- 1.2.6** The Engineer may require further quality control testing at the Contractor's expense if initial results are not satisfactory.

END OF SECTION

1.1 SECTION INCLUDES

Requirements for utilities used on site during construction.

1.2 ELECTRICITY

1.2.1 Provide and pay all costs for the use of electricity for any purpose of the Work including lighting. Also provide and erect all necessary temporary wiring, distribution boxes and panels, and remove on completion of the Contract.

1.2.2 The City will pay for costs associated with traffic control devices.

1.3 TELEPHONE

Provide, maintain and pay all costs for a telephone for the use of the Contractor if needed. The Engineer will not require the use of a telephone.

1.4 WATER

1.4.1 Provide and pay all costs for all water required for the performance of the Work, in accordance with governing regulations and ordinances.

1.4.2 Furnish and install all necessary temporary water piping and remove on completion of the Work.

1.4.3 When connecting or disconnecting temporary water services, the Contractor shall have at least one representative on site until it has been determined that all affected customers have water service. The Contractor must do this determination by personally checking with each customer.

1.4.4 Walkway ramps are to be placed by the Contractor over temporary water service hoses where those hoses cross private or City sidewalks.

1.5 GAS

1.5.1 Provide and pay all costs for gas required for the performance of the Work, in accordance with governing regulations and ordinances.

1.5.2 Furnish and install all necessary temporary gas piping and remove on completion of the Work.

1.6 HEATING AND VENTILATING

1.6.1 Provide and pay all costs for heating and ventilating, coverings and enclosures as necessary to protect and perform the Work.

1.6.2 Furnish and install all necessary temporary equipment, piping, wiring and ducting to perform the Work and remove on completion.

1.6.3 Temporary heating and ventilating shall be in accordance with all governing regulations and ordinances.

1.6.4 Temporary heating and ventilating shall be provided to:

- facilitate progress of the Work;
- protect the Work and products against dampness and cold;
- prevent moisture condensation on surfaces;
- provide an atmosphere for curing materials as required;
- provide adequate ventilation to meet safety regulations;
- prevent hazardous accumulation of dust, fumes, mists, vapours or gases in areas occupied during construction; and
- ventilate storage spaces containing hazardous or volatile materials.

1.6.5 Ventilate underground works in accordance with all applicable regulations. Details of proposed ventilation schemes should be submitted to the Engineer at least 10 working days prior to the start of the underground excavation.

1.6.6 The Contractor is responsible for damage to the Work due to failure to provide adequate heat and protection during construction.

1.7 SANITARY FACILITIES

1.7.1 Supply, erect and maintain adequate temporary sanitary toilet facilities for the use of all Workers. Comply with all mandatory requirements of the applicable regulations and ordinances and maintain in a clean and sanitary condition for the duration of the Contract.

1.7.2 Allow the Engineer's staff access to these facilities at all times.

END OF SECTION

1.1 SECTION INCLUDES

All facilities that are to be provided as part of the construction.

1.2 FIRST AID SUPPLIES

Provide medical supplies and equipment at the site for first aid service to all persons injured in connection with the Work, in accordance with Occupational Health and Safety requirements.

1.3 FIRE PROTECTION

Provide and pay all costs for adequate fire protection of the Work and adjacent property.

1.4 TEMPORARY ENCLOSURES

Furnish, install and maintain for the duration of construction all required scaffolds, tarpaulins, barricades, canopies, warning signs, steps, bridges, platforms, fences and other temporary construction necessary for proper completion of the Work in compliance with all pertinent safety and other regulations.

1.5 FALSEWORK AND TEMPORARY CONSTRUCTION SUPPORTS

1.5.1 The Contractor shall be responsible for the methods to be used for temporary works.

1.5.2 On major structures employ a qualified Professional Engineer, registered in Alberta, for the design of temporary works and design in accordance with CSA-S269.1.

1.5.3 Record design calculations and drawings to show that temporary works are adequate. Provide design loads, material details and dimensions. Sign and seal design calculations and drawings, and any revisions.

1.5.4 The Engineer's approval to proceed with temporary works shall not relieve the Contractor of responsibility.

1.6 WINTER CONSTRUCTION

Special construction methods required to perform the contract in severe weather shall be the responsibility of the Contractor.

1.7 CONSTRUCTION WITHIN RESIDENTIAL AREAS**1.7.1 General**

Most projects are within residential areas. The Contractor will be required to protect the public and maintain access to local traffic with as little disruption as possible.

1.7.2 Notification of Business and Residences Prior to Construction

Notify, in writing, every business or resident whose lot is fronting, backing or immediately adjacent to the construction site, at least seven days in advance of construction in the affected area. Print notice on the Contractor's letterhead and submit to the Engineer for approval prior to delivery. Give approximate dates of construction in affected block(s) and clearly indicate Contractor's name, address and telephone number, as well as a telephone number which residents can call for 24-hour emergency service. The notice shall also include a contact person for reporting damage to personal property, alternative parking, access, garbage disposal and temporary water systems. It is recommended that a notice that warns parents of the dangers that exist on construction sites be delivered to every household in the vicinity of construction. The City of Edmonton contact's name and telephone number are to be included in the notice.

1.7.3 Notification of Disruption of Water and Sanitary Services

In the event that it should become necessary to disrupt water or sanitary services to any residences during the course of construction, the Contractor is required to give 48-hours written notice of the intended disruption to all affected residences and businesses. The notice is to be delivered to an adult member of the household.

1.7.4 Providing, Repairing and Maintaining Temporary Utility Services

1.7.4.1 Provide, maintain repair temporary water, sewer, gas, power and other utility services.

1.7.4.2 The responsibilities and costs for providing temporary utility services shall be borne by the Contractor and no extra payment will be allowed.

1.7.4.3 During construction and warranty periods Contractor shall respond to customers or property owners requests for remedial work to maintain or repair temporary utility services or to correct faulty work or products within reasonable time, normally one to two hours. If the Contractor does not do this then the City shall have the right to carry out the necessary remedial work using the City's own forces or another contractor and shall either charge the Contractor for the cost of this work or deduct the cost from the contract value or any money due to the Contractor.

1.8 SURVEY**1.8.1 Survey Monuments**

Know the location of survey monuments in the vicinity of the Work site before commencing Work. Ensure that no monument will be disturbed by construction activity. The City will charge the Contractor for the cost of restoring disturbed monuments unless the Engineer authorizes such disturbance.

1.8.2 Survey Stakes

1.8.2.1 The Engineer will set out, free of charge, survey stakes or marks necessary for laying out the principal alignments and grades for construction. Give the Engineer at least 48 hours notice prior to requiring stakes at any location.

1.8.2.2 Know and verify the meaning and accuracy of all stakes and marks. No claim will be allowed on account of alleged inaccuracies in setting stakes, unless the Engineer is notified immediately when inaccuracies are discovered, or the Contractor's reasonable inspection of the stakes could not have revealed any inaccuracies.

1.8.2.3 Ensure that stakes and marks are not disturbed or removed. The City will deduct the cost of replacement stakes from money owing to the Contractor.

END OF SECTION

1.1 SCOPE

- 1.1.1 The standards contained in this section apply to the maintenance of soft landscaping on all City projects.
- 1.1.2 Maintenance activities include turf maintenance, weed and litter control and the maintenance of shrubs, trees and flowerbeds.

1.2 MAINTENANCE

- 1.2.1 The Contractor shall be responsible for the scheduled maintenance of plant, shrub and turf areas from the date of installation and planting until the issuance of a Final Acceptance Certificate at the end of the warranty period.

1.2.2 Clean-up and Replacement

- 1.2.2.1 All planting areas shall be kept clean and free of litter, debris and excess soil resulting from planting or road maintenance. This includes the removal of winter sand deposited on any constructed area within the worksite.
- 1.2.2.2 The Contractor shall collect litter from the site a minimum of twice every 28 days.
- 1.2.2.3 Replace plant material that is dead or diseased during regular scheduled maintenance. The worksite shall not contain dead plant material at any time. Remove and replace any sod showing growth failure or deterioration.
- 1.2.2.4 All replacements shall be shown on the maintenance log.

1.2.3 Weeding

- 1.2.3.1 All planting areas, including shrub beds, tree beds and tree wells are to be kept free of weeds.
- 1.2.3.2 Weeds shall be pulled in such a way as to remove the root and not damage the existing plant material.
- 1.2.3.3 All project sites are to be weeded a minimum of twice every 28 days and all pulled weeds removed from the site immediately.
- 1.2.3.4 The Contractor shall comply with any weed notices issued by the City under the *Weed Control Act*, R.S.A. 2000 and its regulations. Should the Contractor fail to comply by the day stipulated in the notice then the weeds will be controlled by the City at the Contractor's expense.
- 1.2.3.5 The spot spraying of weeds with an appropriate herbicide, as per manufacturer's recommendations, may be undertaken upon approval by the City and the appropriate authorities. The Contractor is responsible for acquiring all necessary licenses and permits prior to commencing spraying.

1.2.4 Watering

- 1.2.4.1 All trees, shrubs and turf shall be watered as frequently as necessary to maintain optimum soil moisture content for continued growth.
- 1.2.4.2 Trees shall be watered individually using a water probe.

1.2.5 Fertilizing

All trees and turf shall be fertilized according to C.N.T.A., accepted horticultural practices and appropriate for soils analyses performed under the contract.

1.2.6 Pruning

- 1.2.6.1 All dead or broken branches shall be removed using approved pruning practices
- 1.2.6.2 Any cuts or wounds on trees shall be treated with approved pruning practices.
- 1.2.6.3 Pruning shall be undertaken in such a manner as to preserve the natural character of the plant material.

1.2.7 Mowing

- 1.2.7.1 Mow at regular intervals to maintain a grass blade height between 60 mm and 75 mm.
- 1.2.7.2 Do not cut more than 1/3 of blade height at any one mowing.
- 1.2.7.3 Remove all clippings immediately.

1.3 MAINTENANCE LOG

- 1.3.1 Submit a maintenance log for approval to Parkland Services, Project Management at the pre-construction meeting.
- 1.3.2 Submit a maintenance log to Parkland Services, Project Management with monthly invoicing identifying the maintenance work carried out during the month and the areas in which maintenance activities were performed.
- 1.3.3 Submit a maintenance log for maintenance work undertaken during the warranty period.
- 1.3.4 The maintenance log shall contain the following information:
 - 1. Watering Litres/Time/Date/ Location
 - 2. Mowing/Trimming Time/Date/Location
 - 3. Fertilizing Product/Time/Date/ Location
 - 4. Plan Material Replacement Number/Species/Date/Location
 - 5. Sod and Seed Maintenance Square Metres/Date/Location
 - 6. Weeding Date/Location
 - 7. Litter Pickup Time/Date
 - 8. Observations

END OF SECTION

1.1 AUTHORIZATION

- 1.1.1 Authority has been granted to the Director of Traffic Operations through Traffic Bylaw 5590 and City Policy C452 to control all work occurring on road right-of-way.
- 1.1.2 Contractors shall obtain an O.S.C.A.M. permit as outlined in 1.1.3 below:
- BY PHONE: Business Hours: 07:30 - 16:30 hours
496-2680 or 496-2681
- IN PERSON: Traffic Operations Section
15th Floor, Century Place
9803 - 102A Avenue, Edmonton
- 1.1.3 Notify the Transportation and Streets Department of the construction completion date. O.S.C.A.M. permits shall be kept up to date. Evidence of an expired permit is not sufficient reason for a Contractor to continue work at a site.
- 1.1.4 An O.S.C.A.M. Permit is required for:
- All work that involves excavation of roadways, sidewalks, and boulevards.
 - Non-excavation work that interferes with traffic flows on arterial roadways during peak hours (A.M. 7:00 - 9:00; P.M. 15:30 - 18:00 HOURS).
 - All work with a duration of more than four hours at one location.
- 1.1.5 Enter the work site only with prior permission from the Engineer.
- 1.1.6 Notify the Engineer if a work site is to be left without construction activity and traffic safety devices are to be removed. Obtain the Engineer's permission to re-enter the site and resume work.
- 1.1.7 Construct and complete individual locations in the order determined by the Engineer.
- 1.1.8 **Local Improvement Sites**

Construction of local improvements identified as assessable in the list of locations cannot proceed until the covering property share bylaw is finally passed by City Council and certified by the Local Authorities Board.

1.2 PARKING

1.2.1 Business or Local Resident

- 1.2.1.1 Off-street parking and access shall be maintained where possible. If parking will be lost, the responsible Contractor shall provide nearby alternate parking.
- 1.2.1.2 With 48 hours notice, the Contractor may request Traffic Operations, 496-2671, to remove a parking restriction on a City roadway to provide alternative on-street parking. **Usually this is not possible on an arterial or freeway.**

1.2.2 Contractor Vehicles

Do not park vehicles and equipment where there is a local parking shortage for local businesses and residents.

1.2.3 Parking Meters

- 1.2.3.1 At locations where parking meters must be removed, contact Traffic Operations, 496-2671, with seven working days notice.
- 1.2.3.2 Traffic Operations shall be contacted 48 hours in advance to bag meters. Contractor and employee vehicles and equipment shall not park at bagged meters. The cost of bagging the meters will be borne by the Contractor. For each day a meter is bagged, the Contractor shall bear the cost of compensation for the loss of meter revenue to the City's Transportation and Streets Department. The cost to be paid is currently \$10.00 per meter per day.
- 1.2.3.3 Courtesy parking permits may be issued to local businesses or residents only for the purpose of alternate on-street parking.

1.2.4 Temporary Parking Spaces

Provide temporary parking spaces for property owners whose access to their normal parking spaces, e.g. garages and parking lots, are affected by the construction. The costs for providing temporary parking spaces and other related costs shall be borne by the Contractor and no extra payment will be allowed.

1.2.5 Installation of Temporary No Parking Signs

- 1.2.5.1 Upon determination of need, the City representative will approve the placement of temporary "No Parking" signs for construction or street maintenance 24 hours prior to on-site activity and return the proper records to Traffic Operations.
- 1.2.5.2 The City representative will ensure that the license numbers of all vehicles parking in the affected area are recorded during the placement of signs.
- 1.2.5.3 The completed licensing form will be delivered by the jobsite representative during normal working hours, 7:30 to 16:30 hours, to Traffic Operations, 15th Floor, Century Place, 9803 - 102A Avenue, or outside normal working hours to Roadway Operations, 10517 - 95 Street.
- 1.2.5.4 The sign and A-Frame mounting must be in accordance with Drawing 3.920 and must be clearly marked with the owner's name.
- 1.2.5.5 When police enforcement of temporary "No Parking" signs is requested, the City representative, with the record of license numbers, will meet the police on-site to verify the validity of the signs.
- 1.2.5.6 The City representative will ensure that temporary "No Parking" signs are not placed until required and are removed immediately upon completion of work.
- 1.2.5.7 Temporary "No Parking" signs will not be used at parking meters. If there is a requirement for "No Parking" at meter locations, a meter hooding request must be made to Traffic Operations
- 1.2.5.8 Traffic Operations reserves the right to refuse the temporary installation of "No Parking" signs, and will remove and destroy any unauthorized signs.

1.3 TEMPORARY ACCESSES TO PRIVATE OR CITY PROPERTIES

- 1.3.1 Provide temporary accesses to private or City properties when accesses to the properties, i.e. sidewalks and driveway, are affected by construction. All direct and related costs for providing temporary accesses to private or City properties shall be borne by the Contractor and no extra payment will be allowed.
- 1.3.2 During construction period, if the Contractor shall respond to property owner's requests for providing temporary accesses to her or his property or properties within reasonable time, normally one to two hours. If the Contractor fails to do this, then the City shall have the right to provide temporary access using the City's own forces or another contractor and shall charge the Contractor for the costs of the work or deduct the costs from the contract value or any money due to the Contractor.

1.4 TRANSIT AND EMERGENCY VEHICLE PRIORITY

1.4.1 Transit routes, emergency vehicle routes, and transit zones shall be kept clear of encumbrances except with the permission of Traffic Operations, 496-2671.

1.4.2 Transit, 496-2688, shall be notified for interference's with overhead trolley lines.

1.5 PEDESTRIAN TRAFFIC

1.5.1 Maintain safe passage for pedestrians at all times by effectively separating pedestrians from vehicles and equipment.

1.5.2 Bridges and other approved means shall be used to cross open excavations. The bridges shall be of a smooth but skid-resistant walking surface not less than one metre wide with handrails on both sides. The structure shall be rigid and securely supported.

1.6 TRAFFIC SIGNALS

1.6.1 These are the responsibility of Traffic Operations, 496-2668.

1.6.2 Give at least 48 hours notice to Traffic Operations, Transportation and Streets Department to remove, cover, or relocate traffic signs affected by construction.

1.7 TRAFFIC SAFETY DEVICES

1.7.1 Follow the standards and recommended procedures contained in the Procedures Manual for On-Street Construction Safety. Free copies may be obtained from Traffic Operations, 15th Floor, Century Place, 9803 - 102A Avenue.

1.7.2 Except for locations designated in Special Provisions and regulatory signs, the Contractor shall supply, install, and maintain signs and barricades bearing the Contractor's name, flashing lights, other safety devices, and flagpersons necessary to handle traffic around or through job sites and through designated detour routes. Before interfering with traffic flow, submit if requested by the Engineer for approval and information, a sketch plan showing proposed layout of signs, barricades, and lights. Failure to properly place and maintain these devices will result in the issuance of a stop work order until the problem is rectified, or will cause the City to place and maintain such devices and deduct costs from money owing to the Contractor.

1.7.3 Regulatory Signs

1.7.3.1 Traffic Operations, Transportation and Streets Department, upon a minimum 2 weeks prior notice, will provide and install regulatory (e.g. stop, yield, no parking) signs, and will remove or cover them when necessary. The Contractor shall maintain such signs in place.

1.7.3.2 Display the flagperson sign only when the flagperson is in the act of controlling the traffic.

1.7.3.3 Display other advance warning signs only when there is interference to normal traffic.

1.7.4 Permanent Record of Traffic Safety Devices Placement

Conform to the following procedure:

1.7.4.1 Record keeping shall include the minimum required items of information indicated at the end of this section and may be supplemented by other relevant information.

1.7.4.2 Enter the correct location; dates and times of device installation, inspection, relocation, removal; signatures and other useful information.

1.7.4.3 Make up a diagram showing the relative placement of signs, barricades, barriers, lights, flagpersons and other devices using symbols from the Procedures Manual for On-Street Construction Safety. Attach photographs if necessary for clarity.

1.7.4.4 Make up a separate diagram for the initial set-up and for each repositioning of the devices.

- 1.7.4.5 Turn in to the Engineer a copy of the initial set-up after placement.
- 1.7.4.6 Submit to the Engineer monthly, or together with each progress claim, copies of records occurring within that month or claim period. Failure to submit such records will be sufficient ground for withholding progress payment.
- 1.7.4.7 Upon completion of the Contract, submit copies of all records. Failure to submit will be sufficient cause for withholding the construction completion certificate.

1.8 WORK AREA RESTRICTION

1.8.1 General

- 1.8.1.1 Confine construction activity to the amount of roadway permitted by the Engineer and by Transportation and Streets Department, as warranted by traffic volume and the availability of a detour or alternate roadway.
- 1.8.1.2 Do not encumber the roadway with piles of material, unless permitted by the Engineer and proper barricades and flashing lights are installed.
- 1.8.1.3 Park or store equipment only at places and for time periods permitted by the Engineer. Provide adequate traffic safety devices for them.

1.8.2 Access to Abutting Property

Provide and maintain reasonable access to abutting places of business and other property where necessary, at own expense, unless stated otherwise in writing.

1.8.3 Road Closure

- 1.8.3.1 When a street or lane is to be closed for construction, notify each abutting property owner, agent or tenant at least seven days prior to starting work. Total road closures shall be approved by Traffic Operations.
- 1.8.3.2 Closure of parallel streets occurring simultaneously will not be allowed.
- 1.8.3.3 Closure of consecutive intersections and/or blocks will not be allowed.
- 1.8.3.4 Road restoration or reconstruction shall follow immediately upon completion of underground construction.

1.9 PUBLIC RELATIONS

Notification stating what is happening to the roads and sidewalks shall be delivered to the local businesses and residents at least 48 hours before start of construction. The notice should be a description of what is taking place, start date, and estimated duration of the project.

1.10 RECORD FORMS

The Traffic Detour Record and the Inspection Record forms required by Clause 1.7.4 - Permanent Record of Traffic Safety Devices Placement, are appended at the end of this section.

END OF SECTION (excepting forms)

TRAFFIC DETOUR RECORD

Location: _____ OSCAM Permit No. _____

Detour Start Date: _____ Detour Completion Date: _____

Contractor's _____ Traffic Course _____

Site Representative: _____ Certificate No. _____

Contractor: _____ Contract No. _____

Note: All barricading and signing to conform to the Edmonton Procedures Manual for On-Street Construction Safety.

DIAGRAM

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**(Inspection Record Over)**

1.1 GENERAL

All work performed shall conform to the requirements of the Province of Alberta, *Environmental Protection and Enhancement Act*, R.S.A. 2000 and all associated Regulations.

1.2 POLLUTION

1.2.1 Garbage Collection

If the date of garbage collection falls within the lane closure period, ask house occupants to bring their garbage to the front side of the house. Make arrangements for removing the garbage from the front side of the houses to a location where sanitary trucks can pick up without driving on the closed road or excavated area. No extra payment will be made to the Contractor for the above works.

1.2.2 Air Pollution Control

1.2.2.1 Control objectionable dust conditions whether it is caused by traffic or construction equipment.

1.2.2.2 Abide by the Alberta Board of Health Regulations regarding air pollution.

1.2.2.3 Fires and burning of rubbish on site is not permitted, unless the authority having jurisdiction has issued a burning permit.

1.2.3 Noise Abatement

The Contractor is reminded that the Noise Abatement Bylaw restricts the levels of noise permissible at various hours in residential, commercial and industrial districts of the City and provides penalties for violations. Before commencing work, the Contractor may apply in writing to the Development Compliance Branch, 5th Floor, Chancery Hall for a special permit suspending provisions of the bylaw at specified locations. The Contractor shall provide the Engineer with a copy of the application and the permit obtained before commencing work at those locations.

1.2.3.1 All excavating and hauling equipment must be equipped with suitable muffling systems.

1.2.4 Disposal of Waste

1.2.4.1 Do not bury rubbish and waste materials on site.

1.2.4.2 Do not dispose of chlorinated water with a free chlorine content of greater than 2 micrograms per litre or waste or volatile materials, such as mineral spirits, oil, paint thinner, into waterways, storm or sanitary sewers.

1.2.5 Drainage

1.2.5.1 Provide temporary drainage and pumping as necessary to keep excavations and site free from water.

1.2.5.2 Do not pump water containing suspended materials into waterways, sewer or drainage systems.

1.2.5.3 Control disposal of runoff water containing suspended materials or other harmful substances in accordance with local authority requirements and the Engineer.

1.2.5.4 Temporary re-routing of existing drainage to be approved by the Engineer.

1.2.5.5 Assume responsibility for the quality of all water discharged to any sewer or drainage course.

1.3 HAUL ROUTES

1.3.1 Rubber-tired motor scrapers shall not be used to haul over improved streets or gas lines.

1.3.2 Trucks shall be loaded and covered in such a manner that no spillage occurs during the haul.

1.3.3 Submit the intended haul routes prior to hauling.

1.3.4 Observe truck loading limits and use truck routes permitted by the Edmonton Traffic Bylaw.

- 1.3.5 The Engineer reserves the right to further restrict loads that may cause physical damage to the Work or cause spillage of material in transit.
- 1.3.6 Provide adequate protection to existing curbs, walks, bikeways and improved roadways when these must be crossed by hauling or earth-moving equipment. After use remove temporary protection, repair any damage and restore disturbed areas to original condition.
- 1.3.7 Load trucks in a manner that will prevent spillage and tracking of soil or debris on improved roadways. Clean up immediately to the satisfaction of the Engineer if spillage or tracking does occur. Tracking is subject to penalties under the Edmonton Traffic Bylaw.
- 1.3.8 **Upkeep**
- 1.3.8.1 Maintain haul routes fit for hauling.
- 1.3.8.2 Clean haul routes as directed by the Engineer. Failure to clean up haul routes may result in City crews doing the cleaning without notice to the Contractor and the costs will be deducted from moneys due to the Contractor.
- 1.4 **TREES AND PLANTS**
- The City of Edmonton Corporate Tree Management Policy, Volume 6 Landscaping, is to be adhered to for all aspects of this project which impact on existing trees and shrubs. The Contractor shall bear all costs under this policy for trees which are damaged or destroyed unless the affected trees are shown on the drawings as being damaged or destroyed as part of the construction.
- 1.5 **MATERIAL HANDLING**
- 1.5.1 **Material Storage**
- 1.5.1.1 Storage of excavated material or material supplied for the project on streets, lanes, or City right of way is prohibited except with the prior approval of the Engineer.
- 1.5.1.2 Storage of more materials than is required for the work on hand is prohibited without prior written permission from the Engineer.
- 1.5.1.3 Material shall not be stored on private property except with the prior written permission of the owner. The Contractor shall provide a copy of that consent when requested by the Engineer.
- 1.5.2 **Surplus Material**
- 1.5.2.1 **Asphalt and Concrete:** All waste concrete, soil cement and asphalt shall be broken up as specified in Section 02224 – Pavement and Concrete Removal, Volume 2 Roadways and hauled to the nearest stockpile site or as designated in the Special Provisions.
- 1.5.2.2 **Asphalt Millings:** Unless determined otherwise by the City, asphalt millings shall be disposed of by the Contractor at the Contractor's expense as noted in Section 02961 – Pavement Cold Milling, Volume 2 Roadways.
- 1.5.2.3 **Metals:** Salvage cast iron, steel and other surplus materials of value. These will become the Contractor's property and should be recycled. The Contractor shall obtain the prior approval of the Engineer before removing any item from the site under this clause.
- 1.5.2.4 **Other Materials:** Minimize other waste and surplus materials. Recover or recycle materials where practical and economic. Dispose of all other waste and surplus materials off site.
- 1.5.3 **Explosives**
- 1.5.3.1 No explosives of any kind shall be used without written authorization from the Engineer.
- 1.5.3.2 If such authorization is obtained, the Contractor shall comply with the Explosives Safety Regulations under the Occupational Health and Safety Act and all other relevant legislation.

1.6 CLEANING DURING CONSTRUCTION

- 1.6.1 Maintain the work, at least on a daily basis, free from accumulations of waste materials and debris.
- 1.6.2 Remove waste materials, debris and surplus or salvaged material belonging to the Contractor from site.
- 1.6.3 Repair any damage to City or private property to the Engineer's satisfaction within three days of the damage occurring.
- 1.6.4 Failure to clean up work sites may result in City crews doing the cleaning without notice to the Contractor and costs will be deducted from moneys due to the Contractor.
- 1.6.5 The Engineer may direct the Contractor to maintain a closed street or lane with proper lighting and barricades until clean-up is complete and damage repaired.
- 1.6.6 Use only cleaning materials recommended by manufacturer of surface to be cleaned.

1.7 FINAL CLEANING

- 1.7.1 When the Work is totally performed and prior to the start of construction completion inspection, the Contractor shall remove surplus products, tools, construction machinery and equipment.
- 1.7.2 Remove grease, dust, dirt, stains, labels, fingerprints and other foreign materials, from interior and exterior finished surfaces.
- 1.7.3 Wash down or broom clean concrete surfaces or asphalt surfaces; rake clean other surfaces of ground.
- 1.7.4 Remove waste products and debris, and leave the Work area clean and suitable for occupancy by the City.

END OF SECTION

1.1 DESCRIPTION

1.1.1 This section sets out the procedures to be observed when constructing crossings of all High Pressure Hydrocarbon Pipelines.

1.1.2 This procedure is to be in effect exclusively and may **not** be relaxed on supervisory discretion.

1.2 REGULATIONS

1.2.1 Alberta Pipeline Act.

1.2.2 Alberta Electrical Protections Act.

1.2.3 Alberta Occupational Health and Safety Act.

1.2.4 Canadian Transportation Commission Order Respecting Railway Crossing.

1.2.5 Canadian National Railway and Canadian Pacific Railway Requirements for Pipeline Crossing.

1.2.6 Alberta Transport - Highways - Requirements for Pipeline Crossing.

1.2.7 Canada - Navigable Waters Protection Act.

1.2.8 Alberta Environment - Water Resources Division and Fisheries and Wildlife Division Requirements for Construction in Surface Waters.

1.2.9 City of Edmonton Land Use Bylaw 5996.

1.2.10 National Energy Board Act.

1.3 DEFINITIONS

1.3.1 **“High Pressure Pipelines”** shall mean any pipeline used for the purpose of transporting hydrocarbon products under pressures in excess of 700 kPa. This shall not be construed to apply to low, medium or intermediate pressure natural gas distribution lines for domestic service.

1.3.2 **“Contractor”** shall mean any firm or organization operating under a direct contractual agreement with the City of Edmonton.

1.3.3 **“City Inspector”** means the inspector or official representative of the City of Edmonton responsible for ensuring conformance with this policy, to be identified specifically at the commencement of any Contract that includes crossing(s).

1.3.4 **“Resident Engineer”** means that person designated by the Engineer to provide on-site monitoring, testing and inspection requirements for the Contract.

1.3.5 **“Superintendent”** means the person appointed by the Contractor to supervise and control the operations of the Contractor’s site personnel or sub-contractor.

1.3.6 **“Surveyor”** means a competent person engaged by the Contractor or provided by the City to establish and maintain alignments and grades as shown on the drawings.

1.3.7 **“Pipeline Company”** means the owners of the High Pressure Pipeline being crossed.

1.3.8 **“Pipeline Inspector”** means the Inspector or Representative of the Pipeline Company who is identified as being responsible for observing and approving crossing activities on site.

1.3.9 **“Contract”** means the agreement between the City of Edmonton and the Contractor specifying the work to be completed by the Contractor.

1.3.10 **“Controlled area”** means the area within 30 metres either side of the High Pressure Pipeline right-of-way.

- 1.3.11 **“Crossing agreement”** means the agreement between the City and Pipeline Company stating the conditions that must be satisfied for crossing or working in or near the High Pressure Pipeline right-of-way.
- 1.3.12 **“Crossing plans”** means those drawings depicting the location and management of the proposed crossing and which form a part of the Crossing Agreement.
- 1.3.13 **“Pipeline Owner”** means the representative of the Pipeline Company who is identified as being responsible for developing and co-ordinating approval of the Crossing Agreement.

1.4 RESPONSIBILITIES

- 1.4.1 The Engineer will be responsible for ensuring that all work involved in the preparation of the crossing agreement is complete prior to commencing work and for preparing a permanent record upon completion.
- 1.4.2 The Contractor shall be responsible for notifying the Pipeline Owner of pre-construction site meetings, for scheduling, for obtaining approval to proceed from the Pipeline Company, for the construction techniques utilized and for ensuring that rights-of-way are fenced. The Contractor shall ensure conformance with the technical details of the crossing approval, documentation of crossing activities and on-site co-ordination with the Pipeline Inspector. The Contractor shall abide by all guidelines laid down by the Pipeline Company.
- 1.4.3 The Surveyor shall be responsible for staking the crossing and obtaining and recording accurate “as-built” information.
- 1.4.4 The Resident Engineer shall be responsible for notifying the Pipeline Owner of impending construction in accordance with the Crossing Agreement (but not less than 48 hours advance notice). The Resident Engineer shall also be responsible for recording and distributing minutes of all meetings held pertaining to the crossing.
- 1.4.5 The City Inspector shall be responsible for verifying that the crossing agreement is executed and a copy is on site, that all terms and conditions of the crossing agreement are followed and that the Pipeline Inspector is fully aware of and concurs with, all crossing activities. The City Inspector will keep a record, complete with photographs, of the entire crossing procedure and will ensure that accurate “as-built” information is obtained and recorded by the Surveyor.
- 1.4.6 The Engineer shall ensure that a fully executed crossing agreement is in place prior to approving a construction drawing which shows a crossing of a High Pressure Pipeline.
- 1.4.7 The Pipeline Inspector will observe and approve crossing activities and document the construction procedures used on the crossing report form.

1.5 PROCEDURES

- 1.5.1 No crossing construction activities are to be commenced at any time without fully executed and approved copy of the crossing agreement and crossing plans being available on site.
- 1.5.2 No crossing construction activities are to be commenced without the express written approval of the Pipeline Inspector, which will be retained by the City Inspector.
- 1.5.3 All construction drawings issued for work in the vicinity of the proposed crossing shall have the pipeline right-of-way clearly highlighted with a heavy border and a notation stating:

**“DO NOT CONSTRUCT OR ENCROACH IN THIS
AREA WITHOUT APPROVED CROSSING PERMIT”.**

- 1.5.4 The Engineer is not to release a copy of the crossing plans to the Contractor prior to approval of the Crossing Agreement without it being stamped "PRELIMINARY" and:

**"DO NOT CONSTRUCT OR ENCROACH IN THIS
AREA WITHOUT APPROVED CROSSING PERMIT".**

- 1.5.5 All prints of approved detailed crossing plans issued will bear a stamping stating:

"APPROVED FOR CONSTRUCTION"

and will be signed and dated by the Branch Manager responsible for the design. These will not be signed until the Crossing Agreement is fully executed. No construction activity is to commence without a copy of this plan on site that contains a stamp and signature.

- 1.5.6 A pipeline crossing record shall be kept and shall contain the following:

- 1.5.6.1 Name and phone number of the Pipeline Inspector.

- 1.5.6.2 Special provisions of the Crossing Agreement.

- 1.5.6.3 Records of:

- Calls to Pipeline Inspector;
- Pipeline Inspector's visits - time, date, comments and signature;
- City Inspector's visits - time, date, comments and signature;
- Superintendent's comments or observations relating to the crossing.

- 1.5.6.4 Construction commencement and completion dates.

- 1.5.6.5 The signature of the Superintendent, Surveyor, Pipeline Inspector and City Inspector.

- 1.5.7 All forms are to be updated daily by the responsible party.

- 1.5.8 The Surveyor assigned is not to provide any survey stakes for the purposes of construction without first obtaining an "approved for construction" crossing plan with a stamp, duly signed by the appropriate Branch Manager.

- 1.5.9 Prior to any construction activity in the immediate vicinity of a High Pressure Pipeline right-of-way, the Superintendent will co-ordinate a meeting on site with the Pipeline Inspector, City Inspector and Resident Engineer in attendance. At this meeting the scheduling, notices, special agreement provisions and any other requirements will be reviewed and will be recorded by the Resident Engineer. Minutes will be taken and will require formal endorsement by all those in attendance.

- 1.5.10 A City Inspector will be designated and assigned to every crossing being made and shall be available at the site at all times that any construction is underway on the crossing right-of-way. The City Inspector shall retain a copy of the approved crossing plans on site at all times and shall ensure that all appropriate entries as described in 1.5.6 above are made daily on the crossing record, which shall be returned to the Engineer for verification and retained as a permanent record.

- 1.5.11 The City Inspector will maintain an up-to-date complete daily written log and photographic record of all construction details and activities throughout the crossing procedure, including a series of close-up pictures, properly indexed, showing all exposed surfaces of the High Pressure Pipeline immediately prior to backfilling. The Contractor shall make allowance in the construction procedures for this recording activity.

- 1.5.12 If at any time any unusual circumstances are encountered that could in any way jeopardize the safety or integrity of the High Pressure Pipeline, the City Inspector will stop work immediately and ensure that the Pipeline Inspector, the Engineer and the Contractor are notified immediately. The Engineer and the Contractor are to respond immediately and determine what action acceptable to the Pipeline Inspector is necessary.

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- 1.5.13** No construction activity is to commence in any subdivision where a High Pressure Pipeline right-of-way exists or adjoins until the right-of-way is fully fenced. The minimum acceptable standard shall be snow fencing.
- 1.5.14** No vehicles or equipment are to cross a High Pressure Pipeline right-of-way for any purpose without prior construction of an approved ramp. For purposes of this section, "approved" means approval by the Pipeline Inspector by written field memorandum issued to the Superintendent, who must retain this on site at all times that construction activity is in progress. On completion of the Contract the Superintendent shall give the memo to the City Inspector for return to the Engineer for permanent record purposes.

END OF SECTION

1.1 GENERAL

- 1.1.1 The information shown on the drawings concerning type and location of underground and/or overhead utilities is not guaranteed to be accurate or all-inclusive. The Contractor is required to request the assistance of Alberta First Call (Phone 1-800-242-3447) for marking utilities.
- 1.1.2 Where noted on the construction drawings or noted through Alberta First Call that the construction activity will result in the crossing of a high pressure pipeline, the provisions of Section 01561 - High Pressure Pipeline Crossing Procedures apply.
- 1.1.3 Make arrangements and pay for the temporary relocation of any telephone, power, street lights, gas lines or any other underground or overhead utilities should this be necessary as a result of work performed under this Contract.
- 1.1.4 Maintain the flow in existing water services, storm and sanitary sewers, drains and water courses which may be encountered during the course of the Work. The effluent from any drains will not be allowed to flow into the open trench.
- 1.1.5 The City reserves the right to charge the Contractor for the costs associated with the protection, repair and restoration of the existing underground utilities, utility trenches or structures to meet utility companies' or Department's standards and other requirements, if the Contractor fails to do so. These costs shall be deducted from the contract value.
- 1.1.6 The Engineer shall be given a copy of correspondence between the Contractor and the utility companies regarding the Work.

1.2 SEWERS

- 1.2.1 For a crossing over an existing sewer, if the height from underside of the proposed water or sewer pipe to top of sewer pipe is less than 800 mm, excavate around the existing pipe to firm ground; place cement stabilized granular bedding around the existing pipe and up to the underside of the bedding specified for the sewer or water pipe. The top of the stabilized bedding shall extend across the full width of the trench and 0.5 m on either side of the sewer pipe and shall slope downward and outward at 1:1 on both sides of the sewer pipe to firm ground.
- 1.2.2 Where a sewer pipe meets an existing water pipe at grade, advise the Engineer and obtain instruction; the Engineer may order the water pipe to be diverted over the proposed sewer pipe.

1.3 PETROLEUM AND GAS PIPELINES

- 1.3.1 As far as is practical, bore under existing pipelines.
- 1.3.2 If steel or ductile iron sewer pipe is used, provide Cathodic Protection between the sewer pipe and the existing pipeline, in accordance with the pipeline owner's requirements.
- 1.3.3 If the existing pipeline must be exposed, repair any damage to the pipe or coating and obtain an inspection by the pipeline owner immediately before backfilling. Provide a signed copy of the Inspection Report to the Engineer.
- 1.3.4 Notify the Engineer, the City of Edmonton Fire Department and Police Department 48 hours prior to starting any field work.
- 1.3.5 Follow closely the provisions of Section 01561 - High Pressure Pipeline Crossing Procedures.

1.4 BURIED HIGH VOLTAGE TRANSMISSION (H.V.T.) LINES

- 1.4.1 As far as is practical, bore under H.V.T. lines.
- 1.4.2 If steel or ductile iron sewer pipe is used, provide Cathodic Protection between the metal casing on the H.V.T. line and the sewer pipe, in accordance with the H.V.T. line owner's requirements.
- 1.4.3 If the H.V.T. line must be exposed, provide adequate temporary and permanent support across the sewer main excavation in accordance with the H.V.T. line owner's requirements. Repair any damage to casing or coating and obtain an inspection by the H.V.T. line owner immediately before backfilling.
- 1.4.4 Install a casing of the diameter, length and strength required for the size of pipe being installed. The casing shall fit tightly into the borehole.
- 1.4.5 Install the pipe through the casing. If a sewer pipe is being installed, make a hydrostatic pressure-leakage test in accordance with Section 02958 – Leakage Testing of Sewers, Volume 3 Drainage.
- 1.4.6 If the casing is in tunnel, install Class B bedding to fill the entire tunnel cross-section.
- 1.4.7 Beyond the ends of the casing, install Class B bedding or a higher class if specially designated. Install ordinary backfill compacted to 97% one mold Proctor density.

1.5 ENTRY INTO UTILITY VAULTS AND MANHOLES

No unauthorized person or equipment shall be allowed entry into any utility vault or manhole. If entry into such vault or manhole is necessary in connection with work under the Contract, notify the utility owner at least 24 hours before the intended entry in order to obtain permission and proper instructions and to be accompanied where necessary by a qualified representative of the utility. In addition, use proper procedures for entry into confined space as required in the Occupational Health and Safety Act and regulations.

1.6 MANHOLE AND VAULT COVERS

When temporary removal of a manhole or vault lid is required for adjustment or other work, do not leave the manhole or vault open while unattended. Provide adequate protection and cover if it becomes necessary to leave the manhole or vault unattended without its lid in place.

1.7 SEWER SYSTEM PROTECTION

Provide catch basins and manholes with approved temporary covers to prevent debris from entering the sewer system. If debris does enter the system, clean out immediately if sewage is flowing, or at end of work day if system is dry.

1.8 OVERHEAD POWER LINES

- 1.8.1 All work in the vicinity of overhead power lines shall be governed by the Electrical and Communication Utility System Regulation, adopted by the Alberta Safety Codes Act. The safe limit of approach distances from overhead power lines for persons and equipment provided in those regulations shall be strictly observed.
- 1.8.2 Prior to working on easements containing high voltage electrical power lines the Contractor shall contact the utility operator to confirm proposed working methods.
- 1.8.3 If required by the Engineer the Contractor shall erect barricades or warning structures to either enforce physical separation or alert site personnel to the dangers of contacting overhead power lines.

1.9 STREET FURNITURE

Notify the relevant authority and arrange for removal or relocation of transit shelters, postal boxes, newspaper vending machines, telephone booths, parking meters and other street furniture affected by construction.

1.10 HYDRANT USE PERMIT

1.10.1 The City's Water Works Bylaw that requires Contractors to obtain a hydrant use permit in order to take water from a hydrant. If water is needed at a job site, apply for a hydrant use permit from Aqualta at least 5 working days beforehand. Call Water Dispatch at (780) 412-6800 for information.

1.10.2 Pay all fees, deposits, fines, water use charges and any other charges pursuant to the Water Works Bylaw.

END OF SECTION