

The background of the cover is a composite image. The top half shows a city skyline with several tall buildings under a clear blue sky. The bottom half shows a river with a rocky bank and green trees, with the city buildings reflected in the water. A vertical white line is on the left side of the page.

Design and Construction Standards

VOLUME 1: GENERAL

City of Edmonton
July 2020 Edition

Edmonton

TABLE OF CONTENTS

CHAPTER 1: INTENT AND USE OF THE DESIGN AND CONSTRUCTION STANDARDS	2
CHAPTER 2: GENERAL PROVISIONS FOR DEVELOPERS	15
CHAPTER 3: STANDARDS	24
CHAPTER 4: OCCUPATIONAL HEALTH AND SAFETY REQUIREMENTS	31
CHAPTER 5: MEASUREMENT AND PAYMENTS	34
CHAPTER 6: PROJECT MANAGEMENT AND COORDINATION	72
CHAPTER 7: SUBMITTAL PROCEDURES	73
CHAPTER 8: QUALITY ASSURANCE	76
CHAPTER 9: QUALITY CONTROL	77
CHAPTER 10: TEMPORARY UTILITIES	78
CHAPTER 11: CONSTRUCTION FACILITIES	80
CHAPTER 12: MAINTENANCE OF SOFT LANDSCAPING	82
CHAPTER 13: PROTECTION OF THE URBAN ENVIRONMENT	84
CHAPTER 14: VEHICULAR ACCESS AND PARKING	88
CHAPTER 15: HIGH PRESSURE PIPELINE CROSSING PROCEDURE	90
CHAPTER 16: CROSSING AND PROTECTING EXISTING UTILITIES AND STRUCTURES	93

1. APPLICATION OF THESE DESIGN AND CONSTRUCTION STANDARDS

This document has been prepared to guide in the design and construction 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, along with normal, reasonable and tolerable responsibilities and costs for maintenance, operation, rehabilitation, and replacement.
- 1.5 To identify those design criteria that the City considers to be the minimum standards acceptable for the expected typical conditions over the lifecycle of the municipal improvement or system.
- 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. COMMITMENT TO ENVIRONMENTAL STEWARDSHIP AND SUSTAINABILITY

- 2.1 The construction of municipal improvements and systems must be in compliance with environmental regulatory requirements and be safe, functional and have reasonable life cycle costs. Neighbourhoods must be designed and constructed to be sustainable and environmentally resilient for the short, medium and long term, and work must be done in a manner that minimizes the negative environmental and climate change impacts associated with construction and operation.

3. DEFINITIONS AND INTERPRETATION OF TERMS

For the purposes of interpretation of the Design and Construction Standards the following definitions shall apply throughout Volume 1 of the Design and Construction Standards:

-
- 3.1** The **City** may refer to, as appropriate to the context, the City of Edmonton, a Municipal Corporation, and includes all City Departments, as well as EPCOR Water Services Inc., EPCOR Distribution and Transmission Inc., and Drainage Services, EPCOR Utilities Inc., where applicable.
- 3.2** The **Consultant** refers to the professional engineer or professional technologist 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, as defined by APEGA, within the Province of Alberta and be registered as an Engineer in good standing with APEGA, or be registered as a professional technologist within the Province of Alberta and be in good standing with the Association of Science and Engineering Technology Professionals of Alberta, and be operating within the defined scope of practice for which the professional technologist is professionally permitted.
- 3.3** The **Contract** means the agreement between the City of Edmonton and the Contractor specifying the work to be completed by the Contractor.
- 3.4** The **Contractor** refers to a person, partnership, company, or group of persons who, through a contract with the City, or a Servicing Agreement, undertakes all or part of the Work.
- 3.5** The **CCC**, or **Construction Completion Certificate**, is a document signed and sealed by a Professional Engineer, Professional Technologist within their professionally permitted scope of work, or Landscape Architect, Form 171-3629E, certifying that a municipal improvement has been constructed in accordance with the applicable approved Engineering Drawings and the terms of the corresponding Servicing Agreement.
- 3.6** 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.
- 3.7** The **Development Permit** refers to that development permit issued by the City under the Edmonton zoning bylaw.
- 3.8** The **Engineer** refers to the professional engineer authorized by the City or utility agency to enforce the design and construction standards and specifications, review and approve design submissions, reports, proposals, and engineering drawings. In addition, when applicable, the Engineer refers to the professional engineer authorized by the City to enforce conditions of Servicing Agreements in relation to land development servicing proposals and designs of municipal improvements under the terms of a Servicing Agreement between the City and a Developer(s). The Engineer must hold a valid permit to practice within the Province of Alberta and be registered as an Engineer in good standing with APEGA. The Engineer also includes individuals authorized by the Engineer to perform on her or his behalf any of the Engineer's function.
- 3.9** The **Engineering Drawings** are the plans that set out the scope and detail of the municipal improvements to be provided by the Developer under the terms of the Servicing Agreement and shall refer to or include, where applicable, landscape drawings. The Engineering Drawings must be assembled under cover of a Consultant eligible to practice engineering within the Province of Alberta and registered with APEGA.
- 3.10** The **FAC**, or **Final Acceptance Certificate**, means a document signed and sealed by a Professional Engineer, Professional Technologist within their professionally permitted scope of work, or Landscape Architect, Form 171-3699D, certifying that a municipal improvement has been constructed and maintained in accordance with the applicable approved Engineering Drawings and the terms of the corresponding Servicing Agreement, and that requests that the developer's obligation to maintain the municipal improvement be transferred to the City.
- 3.11** 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 the City the issuance of construction completion certificates (C.C.C.s) and final acceptance certificates

(F.A.C.s). The Landscape Architect must be a member in good standing of the Alberta Association of Landscape Architects.

- 3.12** The **Prime Contractor** refers to the person, partnership, company, or group of persons who, through a contract with the City, or a Servicing Agreement, undertakes all or part of the Work and holds additional obligations related to occupational health and safety.
- 3.13** **Quality Assurance Laboratory** - is the Engineering Services Section, Roads Engineering Branch, Transportation and Streets Department, Transportation Operations Branch, Transportation Services, 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.
- 3.14** **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.
- 3.15** **Qualified Laboratory** - a laboratory practising under the Engineering and Geoscience , Geological and Geophysical Professions Act of Alberta and having the expertise and facilities to perform the specified mix design or testing.
- 3.16** The **Servicing Agreement** refers to a contractual agreement between one or more Developers and the City which specifies the contractual obligations and the terms and conditions for the construction and warranty of municipal improvements necessary to service lands approved for development.
- 3.17** The **Redline(s)** refer to changes to the Engineering Drawings that occur after the original approval of the Engineering Drawings. These changes must follow the City's standard process for Redlines.
- 3.18** The **Reviewing Agencies** refer to the groups within the City and Epcor that review and approve Engineering Drawings and include the following:
- Development Engineering and Drawing Review (Drainage review)
 - Development Engineering and Drawing Review (Transportation review)
 - Development Engineering and Drawing Review (Landscape review)
 - EPCOR Water Services Inc.
 - EPCOR Distribution and Transmission Inc.
 - Traffic Control
 - Street Lighting
 - Development Servicing Agreements
- 3.19** The **Work** refers to any construction, maintenance, or other actions required of a Developer, Contractor, Consultant, or Prime Contractor, as applicable, under a Servicing Agreement or a contract with the City of Edmonton.

4. USE OF THESE DESIGN AND CONSTRUCTION STANDARDS

- 4.1** These standards set out the minimum requirements to be satisfied in the planning, design and construction 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 acceptance or approval, as applicable, of the City.

-
- 4.2** 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.
- 4.3** When using these Design and Construction Standards, 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.
- 4.4** Notwithstanding the use of the terms Contractor or Developer, any obligations found within these Standards are ultimately the responsibility of the party or parties that has entered into the Servicing Agreement or Contract with the City.
- 4.5** The Engineer's acceptance 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.

5. CHANGES FROM THE DESIGN AND CONSTRUCTION STANDARDS AND ITEMS NOT COVERED

5.1 Amendments to Legislation and Bylaws

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

5.2 Changes to City Standards, groups, sections, or departments

Over time, the name and functions of City groups, sections, or departments may change. When these Standards reference a specific City group, section, or department, if changes have been made that make that section, group, or department obsolete, or has changed its function, or has changed its name, the Developer, Consultant, Contractor, or Prime Contractor, as applicable, must connect with the current equivalent group, section, or department and fulfil the obligations as required by the City. Similarly, when this Volume 1 references another Volume of the City of Edmonton Design and Construction Standards, if changes have been made to that section in that Volume referenced, the equivalent section shall apply.

5.3 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 coordinated through the City, providing reasonable notice to the development industry.

5.4 Proposed Alternatives to the Standards

- 5.4.1** Developers, Consultants, and Contractors are encouraged to continuously seek new and better solutions. Where a variation to the standards could achieve a better technical and economical result a proposal should be presented for acceptance by the City. If the Developer, Consultant, or Contractor wishes to apply methods which differ from a standard or specification in this document, or if these standards or specifications do not cover a subject of concern to a specific design, or if it is proposed to use materials not approved in this document, then the responsibility shall be upon the Developer, Consultant, and/or Contractor, as applicable, to justify the proposal or resolve the concern to the satisfaction of the City.
- 5.4.2** The Developer, Consultant, and/or Contractor, as applicable, 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. The Engineer may request that these alternatives be presented via a report that is signed and sealed by a professional engineer.
- 5.4.3** Notwithstanding the review of these alternatives by the Engineer and the acceptance by the Engineer of the proposed alternatives, 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.

6. FINAL DECISION ON DESIGN AND CONSTRUCTION STANDARDS

- 6.1** 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 to new or innovative standards provided that they do not compromise public safety and present a net benefit to the public.

7. STATUTORY REQUIREMENTS FOR APPROVALS BY OTHER AUTHORITIES

- 7.1** It shall be the 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.
- 7.2** Where these standards refer to bylaws, acts, regulations and standards, this shall mean the most recent edition or amendment of the referenced document.
- 7.3** 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.

8. GUIDELINES TO ENGINEERING DRAWING SUBMISSIONS

The following Section 8 applies to private development projects obligated under Servicing Agreements. Capital projects follow the Engineering Drawing procedures laid out by Integrated Infrastructure Services with the City, and details on those processes can be obtained by contacting Integrated Infrastructure Services.

8.1 Engineering Drawing Submission and Approval Process

8.1.1 Engineering Drawings for a proposed subdivision or development will not be accepted for review without the issuance of a Subdivision Authority Approval or issuance of a Development Permit by a Development Planner, as the case may be.

8.1.2 The Consultant shall submit Engineering Drawings a minimum of 100 days before the proposed initial date of construction. The time period for review will be increased as a direct result of excessive number of review cycles and comments as required.

8.1.3 The Consultant shall submit to the Development Servicing Agreements unit of the City a complete set of Engineering Drawings, prepared by a registered professional engineer or professional technologist (engineer), including all design calculations and supporting documents that are relevant to the proposed municipal improvements. Engineering Drawing submissions shall include landscape drawings, where applicable, prepared by a Landscape Architect. All submissions and resubmissions of Engineering Drawings completed through the Engineering Drawing Submission and Approval Process will be done electronically through ePlan and initiated through eServices. For more information on submitting Engineering Drawings electronically through ePlan, please see the City's website at:

[Servicing Agreements and Engineering Drawings](#)

8.1.4 In addition to the Engineering Drawings outlined in 8.1.2, all required supporting documents necessary for Reviewing Agencies to complete their reviews must be submitted through ePlan. Please see the City's website for a list of the required supporting documents at:

[Subdivision and Development Coordination Submission Requirements](#)

8.1.5 Upon submission of the Engineering Drawings and supporting documents, and provided all applicable Subdivision Authority Approval conditions have been adequately addressed, the project will be advanced to the pre-circulation meeting, which is held once a week, for a preliminary review by the Reviewing Agencies. The objective of the pre-circulation meeting is to ensure quality and completeness of the Engineering Drawings and that they are suitable for further review. Engineering Drawings will not be considered ready for review if:

- there are major unresolved issues that may affect the design of the subdivision/development; and/or
- information is missing from the Engineering Drawings that is imperative for the review as outlined in the Design Standards.

8.1.6 Based upon the criteria outlined in Section 8.1.5, the Engineer with Development Servicing Agreements in consultation with the Reviewing Agencies will make the determination whether the Engineering Drawings are ready for circulation. In the event the Engineering Drawings are deemed not ready for circulation at the pre-circulation meeting, the Consultant will be notified that corrections/revisions are needed to the Engineering Drawings, and the consultant will be required to make the necessary revisions and resubmit the Engineering Drawings. In the event the Engineering Drawings are deemed ready, they will be circulated to the Reviewing Agencies for a formal review.

8.1.7 When the Engineering Drawings get circulated, Development Servicing Agreements may choose to eliminate one or more of the Reviewing Agencies from the circulation depending upon the nature and scope of work included on the Engineering Drawings.

8.1.8 Should the Engineering Drawings not receive approval from all Reviewing Agencies, the Engineering Drawings will be returned to the Consultant with comments and the Consultant must address each comment and then resubmit the Engineering Drawings. Development Servicing Agreements will complete a review to ensure that all Reviewing Agencies comments have been addressed.

- 8.1.9** In the event that Engineering Drawing comments have not been addressed, the Engineering Drawings will be returned to the Consultant. In the event that Engineering Drawing comments have been addressed, the Engineering Drawings will be circulated for formal review to the Reviewing Agencies.
- 8.1.10** The Engineering Drawings are targeted to go through a maximum of two or three review cycles, depending on drawing complexity. However, the Engineering Drawings will go through as many review cycles as necessary to obtain all necessary approvals from all Reviewing Agencies.
- 8.1.11** Once the Engineering Drawings have been approved or conditionally approved by all Reviewing Agencies, the Consultant will be required to submit Engineering Drawings with all approval conditions addressed, with the Engineering Drawings digitally signed by a professional engineer or professional technologist (engineer) using a digital signature issued by Notarius, through APEGA. For further information, visit APEGA's website. At this time, there is no digital signature program for Landscape Architects. The City will accept a scanned version of the signed final landscape drawings until such time as a digital signature program exists.
- 8.1.12** Once the Engineering Drawings have been signed and sealed and submitted, the Engineer with Development Servicing Agreements will sign off on the Engineering Drawings on behalf of the City and Epcor.
- 8.1.13** Once the Engineering Drawings have been signed off by Development Servicing Agreements, the Consultant will submit via email the signed Engineering Drawings to EPCOR D & T, EPCOR Drainage, and EPCOR Water in the format required by the specific agency using the NAD83 3TM114 coordinate system.
- 8.1.14** The Developer shall not proceed with construction until the Engineer with Development Servicing Agreements has signed off on the Engineering Drawings and the City has executed a Servicing Agreement for the development.

8.2 Table of Offsets

- 8.2.1** The Table of Offsets forms an integral part of this Volume 1 Design and Construction Standards and is available at:

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

- 8.2.2** The Engineering Drawings and construction must adhere to the offsets provided in the Table of Offsets, unless approval of exceptions to these offsets is given by the City or EPCOR, as applicable.

8.3 Arterial Road Preliminary Design Plan Requirements

- 8.3.1** An arterial concept plan must be approved by the City 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.
- 8.3.2** 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.
- 8.3.3** The Developer shall submit arterial road preliminary design plans (two copies required for first submission) for review and approval by the City when a development involves improvements on an existing and/or proposed arterial road. Approval of such plans is required prior to the submission of detailed Engineering Drawings.
- 8.3.4** 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

8.3.5 Identify permanent and temporary construction on the initial stage relative to the ultimate stage.

8.3.6 Conceptual horizontal and vertical alignments for storm drainage may be required.

8.3.7 Show both existing and proposed utilities (both surface and underground), including but not limited to streetlights, traffic signals, overhead signs, secondary electrical, sanitary, water, gas, power, telecommunications, cable and any other private utilities.

8.3.8 Additional project specific information may be requested.

8.4 Complete Submissions

8.4.1 All engineering drawings submitted to the City for final acceptance must be signed and sealed by a registered professional engineer and shall include a permit to practice number where appropriate.

8.4.2 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. 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.

8.5 General Requirements for Engineering Drawings

8.5.1 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 and appropriate scale bar
- a north direction indicator

8.5.2 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.

8.5.3 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 13. A legend for these symbols and abbreviations shall also be provided on the engineering drawings.

8.5.4 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.

8.6 Typical Plans Included with Engineering Drawings

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

8.6.2 The index 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.

-
- 8.6.3** 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.
- 8.6.4** The topography and land use plan can be combined with the index and list of drawings.
- 8.6.5** The road and sidewalk 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
 - Applicable phasing.
 - All access points into the proposed subdivision, including temporary access connections, emergency accesses, and temporary turnarounds if required
- 8.6.6** The street furniture plan shall include all surface improvements including roads, sidewalks, walkways, catch basins, handrails, footbridges, 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.
- 8.6.7** The street furniture plan and road and sidewalk plan can be combined into one plan.
- 8.6.8** The lot grading plan shall be drawn to a scale of 1:1000 and shall indicate the proposed finished lot corner elevations, the direction of flow of surface drainage on the lots, the original ground contours, proposed curb alignments, berms 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 Drainage Bylaw No. 18093. All lots requiring bearing certificates for foundations on fill, disturbed or unstable soil shall be clearly identified on the lot grading plan.
- 8.6.9** The sanitary, storm and water main overall plan shall be drawn to a scale of 1:1000 and shall indicate the locations of the alignments of sanitary sewers, storm sewers, water mains and services, stormwater management facilities and all associated easements.
- 8.6.10** Gas and power overall plans shall indicate the alignments of gas and power utilities and shall be drawn to a scale of 1:1000. These plans shall be included in the set of Engineering Drawings submitted to the City for review. If telecommunication plans are available, the Consultant shall include these plans in the set of Engineering Drawings submitted to the City for Review.
- 8.6.11** 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 ¼pt 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, streetlights, 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.

8.6.12 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
- Crossfall for sidewalks, walkways and shared-use paths on plan view
- 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
- 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.

8.6.13 Landscape plans shall be drawn to a scale of 1:500 horizontal and shall include the following:

- legal subdivision
- street names and numbers and walkways
- walk alignments;
- utility alignments
- pipeline alignments and transmission tower locations
- surface water appurtenances such as hydrants, air vents, and chambers
- 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
- Natural areas and trees immediately adjacent to the subdivision
- fence details

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

8.6.14 Details of structures, facilities and improvements which are identical to those standard drawings in the City's or EPCOR's Design and Construction Standards do not need to be included in the Engineering Drawings. Custom details of structure, facilities, and improvements and all other structures or unique improvements need to be included in the Engineering Drawings.

8.7 Design Revisions after Acceptance, Redline Approval Process

8.7.1 Where it is necessary, 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 municipal improvement for which the design change is proposed.

8.7.2 Redlines are intended for minor changes to approved Engineering Drawings. Significant changes to approved Engineering Drawings shall be approved through the Engineering Drawing Submission and Approval Process as described in Section 8.1. The determination of whether proposed changes are minor or significant will be decided by the Engineer.

8.7.3 The Consultant shall submit through ePlan the Redline Review Application which, amongst other items, requires the Consultant to outline the extent of the changes proposed and the reason for the proposed changes, along with the Redlines. Changes to the approved Engineering Drawings must be marked in red. The Redline Review Application can be found on the City's website at:

[Subdivision and Development Coordination Submission Requirements](#)

8.7.4 If the Engineering Drawings for the project were not approved through ePlan, the Consultant will be required to upload the approved Engineering Drawings to ePlan.

8.7.5 If the Redlines are being done by a Consultant that did not sign and stamp the original Engineering Drawings, a new signature and stamp are required for the drawing(s). Further, if Redlines are being done by a consulting firm that differs from the original consulting firm, a letter confirming that the original consulting firm has agreed to allow revisions to the design is required.

8.7.6 The Redlines will be circulated to any or all of the Reviewing Agencies. Development Servicing Agreements may choose to eliminate one or more of the Review Agencies from circulation depending on the nature and scope of the changes included on the Redlines.

8.7.7 Should the Redlines not receive approval from all Reviewing Agencies, the Redlines will be returned to the Consultant with comments and the Consultant must address each comment and then resubmit the Redlines. The Redlines will go through as many review cycles as necessary to obtain all necessary approvals from all Reviewing Agencies.

8.7.8 Once approval has been received from all Reviewing Agencies, and if there are no conditions and the Consultant that submitted the Redlines is the same Consultant that originally signed and stamped the Engineering Drawings, the Engineer from Development Servicing Agreements will sign off on the Redlines on behalf of the City and Epcor. In the event the Redlines are approved with conditions and/or the Consultant that submitted the Redlines is not the same Consultant that originally signed and sealed the Engineering Drawings, the Redlines will be returned to the Consultant to be signed and sealed and conditions addressed as required, and then the Consultant shall resubmit the Redlines for sign off by the Engineer of Development Servicing Agreements on behalf of the City and EPCOR.

9. EASEMENTS AND RESTRICTIVE COVENANTS

9.1 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, including any necessary easements on City lands.

9.2 The Developer shall prepare and submit plans to the proper authorities and obtain the necessary permissions to enter upon, cross over, or construct in any City lands.

9.3 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 templates for each department separately, 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 City. Similarly, the Developer shall be responsible for registering all right-of-way plans at the Land Titles Office.

- 9.4** All permanent easements shall be registered prior to application for a CCC and prior to Water, Power, and Drainage being placed into service.
- 9.5** 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 CCC issuance at the discretion of the City.

10. PIPELINE, RAILWAY AND POWER TRANSMISSION LINE CROSSINGS

- 10.1** Where a crossing or working in close proximity to 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 or proximity agreement, as required.
- 10.2** 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 or in close proximity to any gas, oil, or power transmission lines or railways.
- 10.3** 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, or right of way consent and access agreements.
- 10.4** The Developer shall comply with all terms and conditions of the crossing agreement and/or proximity agreement.

11. LAND REQUIREMENTS

- 11.1** 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 subdivision plan and/or roadplan.

12. 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 signed and dated to indicate as-built information. Some City departments or utility agencies may require an additional submission of as-built plans in an acceptable electronic format. If the as-built is only confirming a set of measurements, or confirming that the construction complies with the authenticated design, then it does not require professional restamping. If it has any significant new information as a result of field changes, professional stamping will be required. For further information, see APEGA's three part test to determine if authentication is necessary available at:

[APEGA Three-Part Authentication Test](#)

12.1 As-Built Requirements for Surface Improvements

- 12.1.1** All data shown on the construction drawings shall be changed to as-built information, including:
- Elevations of the catch basins and the inverts and both ends of the leads, 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 straight 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.

- Tree locations and proposed driveways.

12.1.2 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.

12.2 As-Built Requirements for Underground Improvements

12.2.1 Prints of approved design drawings with revisions shown in red may be acceptable, at the discretion of the Engineer.

12.2.2 Refer to the appropriate Volumes of the Design and Construction Standards for further information required on as-built drawings for drainage, water, power and landscape improvements.

12.2.3 The as-built drawings shall be stamped: **“This drawing indicates as-built information”**.

12.2.4 Test results must also be professionally stamped, signed and dated.

12.3 As-Built Submission Timelines

The following table shows when as-builts are required to be submitted for each Reviewing Party.

Reviewing Party	When As-Builts Must Be Submitted
Transportation	Submit approved as-builts prior to the FAC submission.
Streetlighting	Prior to CCC
Landscaping	Submit approved as-builts with the FAC submission
EPCOR Drainage	Submit as-builts with the CCC submission, approval for as-builts required with FAC submission
EPCOR Water	Submit preliminary as-builts with CCC and final mylar as-builts prior to FAC
EPCOR Distribution and Transmission	Submit approved as-builts after construction and prior to energization (therefore prior to CCC and FAC)

13. SYMBOLS AND ABBREVIATIONS FOR USE ON ENGINEERING DRAWINGS

Symbols and abbreviations for use on engineering drawings can be obtained as electronic files, please contact EPCOR Drainage at DRAINS@epcor.com.

END OF SECTION

1. GENERAL

1.1 Scope

This section explains the main responsibilities of the Developer with respect to these Design and Construction Standards in accordance with the Servicing Agreement. Some additional responsibilities are required and detailed further in the subsequent chapters of these Design and Construction Standards.

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 that abide by the APEGA Code of Ethics.

1.2.2 The Developer is responsible for ensuring that their Contractors carry out their responsibilities under the Servicing Agreement and the Design and Construction Standards.

1.3 Compliance with Drawings and Specifications

1.3.1 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 must obtain written approval, unless indication is given otherwise by the City in writing, of those changes prior to construction of the specific part for which the change is proposed. Refer to Chapter 1, Section 8.6, for the procedure to apply for approval of revisions to the Engineering Drawings.

1.3.2 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.

1.3.3 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.

1.4 Provision for Review During Construction

1.4.1 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 Developer and Consultant shall be responsible for all aspects of the execution of the project.

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

1.4.3 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.

1.5 Pre-Construction Requirements

1.5.1 Identification of existing utilities

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

1.5.2 Construction at pipeline rights-of-way

1.5.2.1 Notice prior to starting work

The Consultant shall co-ordinate a meeting on site with the pipeline inspector, contractor, and City representative, 48 hours, or the time period indicated by the pipeline owner, 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.

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

No construction activity is to occur in a development where there is 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.

1.6 Notices to City Departments

1.6.1 Notice of commencement of work

The Developer shall give three (3) business days 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.

1.6.2 Notice to Parks and Roads Services

1.6.2.1 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 Chapter 14 - Vehicular Access and Parking.

1.6.2.2 The Developer shall give notice at least two (2) business days in advance of any closing of developed City streets; the Developer shall provide notice of the closing in writing to Parks and Roads Services. Parks and Roads Services is also to be notified when the affected streets are re-opened to traffic.

1.6.2.3 The Developer is responsible for obtaining all necessary permits for working within the existing road rights-of-way.

1.6.3 Notice when crossing or affecting 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.

1.6.4 Fire hydrant use.

If water is needed at a work site, the Developer shall apply for a Hydrant Permit Agreement from EPCOR Water Services for using fire hydrants in accordance with their instructions and procedures, at least five (5) business days before the intended usage. Call EPCOR Water Services at 780-412-3003.

1.7 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.

1.7.1 Certification of materials quality

1.7.1.1 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.

1.7.1.2 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.

1.7.2 Inspection and testing of material

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.

1.7.3 Unsuitable materials

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

1.7.3.2 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.

1.7.4 Storage of materials

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

1.8 Construction Site Safety

1.8.1 The Developer shall ensure that the Alberta Fire Code and Alberta Occupational Health and Safety Act, Regulations and Code, are followed at all times on the construction site.

1.8.2 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.

1.9 Protection of Existing Improvements

1.9.1 Protection and repair of infrastructure

The Developer shall restore all existing damaged infrastructure or areas to the condition, as nearly as possible, in which they existed prior to the commencement of the work, reasonable wear and tear excepted. In addition to adhering to all applicable regulations, laws, and bylaws, the Developer must also consult the Alberta Fire Code on Maintenance, Notification, and Protection during shutdown of life safety systems prior to making any repairs, alterations, or disruptions.

1.9.2 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. If temporary water is required, the Developer must contact EPCOR Water Services at 780-412-3003; the Contractor is not permitted to provide temporary water.

1.10 Preservation of Access to Abutting Developments

1.10.1 The Developer shall provide and maintain reasonable access that adheres to the Alberta Fire Code and any other applicable regulations, laws, or bylaws to abutting places of business and other properties where necessary, at the Developer's expense, unless stated otherwise.

1.10.2 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 seven (7) days prior to starting work.

1.11 Noise Abatement

The Community Standards Bylaw No. 14600 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 Manager of the Community Standards Branch, for a special permit suspending provisions of the bylaw.

2. TRAFFIC CONTROL

2.1 OSCAM Permit

Pursuant to Edmonton Traffic Bylaw No. 5590, as amended, a permit shall be obtained from Parks and Roads Services 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 and Maintenance

The Developer shall obtain a copy of the "City of Edmonton Procedures for On-Street Construction Safety" from www.edmonton.ca, and follow the standards and recommended procedures therein, and instruct field personnel accordingly, available under "Related Documents" at:

[On-Street Construction & Maintenance Permit](#)

2.3 Traffic Control Devices

2.3.1 With a minimum of two (2) weeks prior notice, Parks and Roads Services shall provide and install regulatory signs, and will remove or cover them when necessary, at the Developer's expense. The requestor / Developer shall maintain such signs in place.

2.3.2 With a minimum of two (2) weeks prior notice, Parks and Roads Services can provide, place and maintain temporary traffic control devices, excluding signals, at the Developer's expense. Alternatively, the Developer may have their Prime Contractor submit a Traffic Accommodation Plan or strategy for approval by Parks and Roads Services and provide this as a self-service option.

3. DEALING WITH EXISTING INFRASTRUCTURE

3.1 Existing Signs and Meters

3.1.1 The Developer shall give notice to the City's Traffic Operations of a request to remove, cover, or relocate traffic signs affected by construction; a minimum of two (2) business days' notice is required for ground level signs, and five (5) business days for overhead signs.

3.1.2 The Developer shall give at least two (2) business days notice to Parks and Roads Services of a request to remove, cover, or relocate 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/Chambers

No unauthorized person or equipment shall be allowed entry into any utility vault, chamber or manhole. If entry into such vault, chamber or manhole is necessary, the utility owner shall be notified at least 72 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 Alberta Occupational Health and Safety Act, Regulation, and Code thereunder.

3.5 Water System Protection

3.5.1 The Developer shall ensure that vehicular access is maintained to all existing valves, chambers, hydrants, service control valves, and other surface level water appurtenances. If access cannot be maintained, the Developer shall contact EPCOR Water Services a minimum of two weeks prior to commencing activities to ensure the appropriate departmental notifications are issued.

3.5.2 The Developer shall ensure that all valve casings are kept free of debris during construction. If debris does enter the casings it should be cleaned out at the end of the workday.

3.5.3 The Developer shall ensure that all casings and chambers are at grade and plumb after construction has been completed.

3.5.4 All connections to the Water System shall be in accordance with Volume 4 of the Design and Construction Standards.

3.5.5 No unauthorized person shall access or operate any fire hydrant, valve or boundary valve, or any other water facility. Any authorized person who accesses or operates any fire hydrant, valve or boundary valve, or any other water facility shall notify EPCOR Water Services at (780) 412-4500.

3.5.6 Any authorized operation of a fire hydrant, valve or boundary valve, or any other water facility shall be strictly in accordance with all applicable condition of the Design and Construction Standards, and any applicable permits

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 six (6) months following a no deficiency inspection by the City for transportation improvements where the trench backfill is a required component.

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 Volume 2: Complete Streets Section 6.1 SGC Hot-Mix Asphalt Concrete and Volume 2: Complete Streets Section 3 SGC Hot-Mix Asphalt Paving, and shall bring the roadway to its original design crown as shown on the Engineering Drawings, within the tolerances allowed in the FAC guidelines.

6. CCCs AND FACs FOR MUNICIPAL IMPROVEMENTS

6.1 CCC and FAC Procedures

CCC and FAC applications are required to be submitted digitally. Post-inspection approvals/rejections by the City will be administered digitally as well. The full list of guidelines and procedures can be found online at:

[City of Edmonton eServices User Manual](#)

6.2 CCC and FAC Requirements

This list is not exhaustive, and additional items may be required on a case-by-case basis at the sole discretion of the City.

The following items are required in conjunction with the request for inspection:

All Departments

- A readable plan highlighting the improvement (11X17), plan must be approved drawing, approved redline or as-built depending on inspection
- Pre-inspection report prepared and signed by the consultant
- Completion of work

Drainage Services, EPCOR Water Services Inc.

- Paving complete for CCC inspection of sewers. Alternative surfaces may be accepted at the sole discretion of Drainage Services.
- Material certification for manholes, frames, covers, and pipes

Water Distribution and Transmission, EPCOR Water Services Inc.

- Paving complete for CCC inspection of watermains. Alternative surfaces may be accepted at the sole discretion of Water Distribution and Transmission.
- Combined Water Pressure and Leakage Test Results
- Chlorine Residual Test Results

Development Inspections – Transportation

- Surface improvement clean and free of debris
- Roads and gutters water flushed immediately prior to inspection
- Deficient areas marked with spray paint and cross referenced to numbers used on deficiency list and index map
- Refer to the Development Engineering Inspector's Manual for detailed requirements for each Municipal Improvement

Development Inspections – Parks

- Approved drawings reflecting the current state/design of the site, to be used during the inspection

The following items are required in conjunction with the application for Construction Completion Certificate:

Drainage Services, EPCOR Utilities Inc.:

- Site Inspection
- CCTV Recordings and Logs
- Leakage Tests
- Geotechnical Compliance (Bedding test results)
- Maintenance Manuals (if applicable)
- Water test (if applicable for swales)
- Drainage Operations approval where applicable (Visual inspection of large diameter sewers 1200mm or larger, Lift/Pump Stations, Control Manholes manual/telemetry)
- Erosion and Sedimentation Control report including weekly records confirming implementation of the ESC plan
- Conditions of Engineering Drawing approval have been met
- Conditions of Subdivision approval have been met
- Conditions of provincial and federal authorities have been met and any licenses, easements or approvals for public infrastructure to be located on lands of other jurisdictions are transfer to the name of the City of Edmonton. This includes, but is not limited to, the requirements and approvals required under the Environmental Protection and Enhancement Act, the Water Act, the Public Lands Act, the Department of National Defense Edmonton Garrison Regulations
- Operational downstream sanitary and storm systems. This does not require that the downstream system has a CCC issued, unless stated otherwise in this Agreement
- Copies of registered easement and restrictive covenant documents
- As-built drawings submitted
- Final Operation and Maintenance (O&M) Manuals for SWMF and pump stations have been submitted and accepted (including commissioning reports and user-friendly drawing). When completion of a finalized manual prior to CCC is not feasible, then to facilitate the timely transfer of operational responsibility, Drainage may accept an interim form of the O&M manual at CCC provided sufficient detail is provided, including preliminary as-builts.
- Sets of approved engineering drawings have been submitted (as per approval letter)
- Asset Cost Form submitted and approved
- Rough Grading Verification letter submitted
- Any complaints have been addressed
- Other design considerations.

EPCOR Water Services Inc.

- As-Built Quantities and Costs Report
- Request for Hydrant Flow Test
- Utility Right of Way (URW) Documents and Crossing Permits
- Digital Service Details
- Digital preliminary as-builts

EPCOR Distribution and Transmission Inc.

- A letter from the Developer requesting the lot rebate and feeder rebate (pdf)
- Construction cost letter (pdf)
- Test Reports (pdf)
- As-built record drawing (pdf)

Development Inspections – Transportation

- Test Results
- Defect assessment for concrete and asphalt density calculated and agreed upon
- Tangible Capital Asset form
- Request for Street ID submitted to Transportation Operations
- Street lighting installed for roads CCC, unless otherwise specified in the Inspector's Manual
- Application for energization of street lights
- Confirmation that street lighting Construction Folder Documentation (as per section 2.4.7.5 in the City's Road and Walkway Lighting Design Manual) is approved by Transportation Operations, Signals and Street Lighting prior to Street Lighting CCC

Development Inspections – Parks

- Maintenance Schedule
- Herbicide/pesticide application logs if applicable

The following items are required in conjunction with the application for Final Acceptance Certificate:

Drainage Services, EPCOR Utilities Inc.:

- Site Inspection
- CCTV Recordings and Logs
- Mandrel Tests (if applicable)
- ESC Requirements (if applicable)
- Final O&M Manual (if O&M Manual not approved at CCC)
- As-Builts submitted and approved
- Service Reports submitted and approved
- All required redlines submitted and approved
- Any complaints have been addressed
- Any omissions at CCC stage, or any CCC conditions have been completed

EPCOR Water Services Inc.

- Confirmation of receipt of water service reports by EPCOR Water and Sewer Servicing (WASS)
- Hardcopy Final As-built Drawings
- Water Main Grade Sheets
- Water Facility Reports

EPCOR Distribution and Transmission Inc.

- Land Titles registered URW document
- Land Titles registered URW plan

Development Inspections – Transportation

- Record Drawings submitted (as-builts)
- FAC test package
- Defect assessment from CCC and additional FAC repair ones issued and billing advice sent
- Request to Transportation Operations to paint lane markings if applicable
- For a roads FAC, written confirmation from EPCOR Water Services Inc. showing that they are satisfied that the final paving has not impacted the water system.

Development Inspections – Parks

- As-built drawings, matching the most recent approved redline if applicable, in PDF and Auto CAD
- Tangible Capital Assets (TCA) form
- Maintenance Log

-
- Herbicide/pesticide application logs if applicable

END OF SECTION

1. SECTION INCLUDES:

References to established standards common to all sections of the Construction Specifications.

2. ORGANIZATIONS ISSUING THE STANDARDS

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

2.1.1 General

AASHTO	American Association of State Highway and Transportation Officials
ABC	Alberta Building Code
ACI	American Concrete Institute
ACPA	American Concrete Pipe Association
AFC	Alberta Fire Code
AI	Asphalt Institute
AISC	American Institute of Steel Construction
AISI	American Iron and Steel Institute
ANSI	American National Standards 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 Protection Association
AWS	American Welding Society
BCLMA	British Columbia Lumber Manufacturers Associations
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
CNLA	Canadian Nursery Landscape Association
CPCI	Canadian Precast/Prestressed Concrete Institute
CRCA	Canadian Roofing Contractors' Association
CRSI	Concrete Reinforcing Steel Institute
CSA	Canadian Standards Association
CWB	Canadian Welding Bureau
ERCB	Energy Resources Conservation Board
FCCHR of the USC	Foundation for Cross Connection Control and Hydraulic Research a division of the University of Southern California
ISO	International Organization for Standardization
LANTA	Landscape Alberta Nursery Trades Association
NACE	National Association of Corrosion Engineers
NAPA	National Asphalt Paving Association
NEB	National Energy Board
NFPA	National Fire Protection Association
NSF	National Sanitation Foundation

PCA	Portland Cement Association
PCI	Precast/Prestressed Concrete Institute
PMBC	Plywood Manufacturers Association of British Columbia
PPI	Plastics Pipe Institute
SJI	Steel Joist Institute
SSPC	Society for Protective Coatings
TAC	Transportation Association of Canada
WCB	Worker's Compensation Board

2.1.2 Utilities

ANSI	American National Standards Institute
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)

2.1.3 Mechanical

AFBMA	Anti Friction Bearings Manufacturers Association
AGMA	American Gear Manufacturers Association
AMCA	Air Movement and Control 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

2.1.4 Electrical

AIEE	American Institute Of Electrical Engineers
AUC	Alberta Utilities Commission
CEC	Canadian Electrical Code
CEMA	Canadian Electrical Manufacturers Association
EEMAC	Electrical and Equipment Manufacturers Association of Canada
IEC	International Electrotechnical Commission
IEEE	Institute of Electrical and Electronics Engineers
IES	Illuminating Engineering Society
IPCEA	Insulated Power Cable Engineers Association
LEMA	Lighting Equipment Manufacturers Association
NEC	National Electrical Code
NEMA	National Electrical Manufacturers Association
NESC	National Electrical Safety Code
SAE	Society of Automotive Engineers

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

3. STANDARDS

3.1 References to standards, manuals or guides throughout 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.

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

ASTM D422	Test Method for Particle-Size Analysis of Soils
ASTM D698	Test Methods 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 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 Methods 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

3.3 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

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

ASTM D558	Test Methods for Moisture-Density (Unit 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 Methods 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

3.5 Asphalt

3.5.1 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 Tester
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

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

Manual Series No. 2 (MS2)	Mix Design Methods
ASTM D5581	Test Method for Resistance to Plastic Flow of Bituminous Mixtures Using Marshall Apparatus (6-Inch Diameter Specimen)
ASTM D5581	Test Method for Resistance to Plastic Flow of Bituminous Mixtures Using Marshall Apparatus (6-Inch Diameter Specimen)

3.5.3 Asphalt paving - the following publications from the Asphalt Institute will serve as a guide 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 Plant Manual

3.5.4 Crack sealant - shall conform to the following standards:

ASTM D1190	Specification for Concrete Joint Sealer, Hot-Poured Elastic Type
------------	--

3.5.5 Slurry Seal: - shall conform to the following standards:

ASTM D244	Test Methods and Practices for Emulsified Asphalts
-----------	--

3.6 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 CSAA3000)
CAN/CSA-A8	Masonry Cement (Included in CSAA3000)
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 CSAA3000)
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 Fabrication and Jobsite Handling of Epoxy-Coated Reinforcing Bars
CRSI	Concrete Reinforcing Steel Institute Manual of Standard Practice

3.7 Unit Pavers

3.7.1 **Concrete pavers** - shall conform to the following standard:

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

3.7.2 **Paving brick** - shall conform to the following standards:

ASTM C902	Specification for Pedestrian and Light Traffic Paving Brick
-----------	---

3.8 Metal

3.8.1 **Chain link fence** - shall conform to the following standards:

CAN/CGSB138.1	Fabric for Chain Link Fence
CAN/CGSB138.2	Steel Framework for Chain Link Fence
CGSB 1-GP-178M	Zing 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

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

CAN/CSA-A5	Portland Cement (Included in CSAA3000)
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

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

CSA-G401	Corrugated Steel Pipe Products
----------	--------------------------------

3.10 Water mains and appurtenances - shall conform to the following standards:

AWWA C104	Cement-Mortar Lining for Ductile-Iron Pipe and Fittings for Water
AWWA C105	Polyethylene Encasement for Ductile-Iron Pipe Systems
AWWA C110	Ductile-Iron and Gray-Iron Fittings
AWWA C111	Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings
AWWA C151	Ductile-Iron Pipe, Centrifugally Cast
AWWA C200	Steel Water Pipe - 6 In. (150mm) and Larger
AWWA C207	Steel Pipe Flanges for Waterworks Service - Sizes 4 In. Through 144 In. (100mm Through 3600mm)
AWWA C208	Dimensions for Fabricated Steel Water Pipe Fittings
AWWA C209	Cold-Applied Tape Coatings for the Exterior of Special Sections, Connections, and Fittings for Steel Water Pipelines
AWWA C210	Liquid-Epoxy Coating Systems for the Interior and Exterior of Steel Water Pipelines
AWWA C213	Fusion-Bonded Epoxy Coating for the Interior and Exterior of Steel Water Pipelines
AWWA C214	Tape Coating Systems for the Exterior of Steel Water Pipelines
AWWA C219	Bolted, Sleeve-Type Couplings for Plain End Pipe
AWWA C301	Prestressed Concrete Pressure Pipe, Steel-Cylinder Type
AWWA C303	Concrete Pressure Pipe, Bar-Wrapped, Steel-Cylinder Type
AWWA C304	Design of Prestressed Concrete Cylinder Pipe
AWWA C500	Metal-Seated Gate Valves for Water Supply Service
AWWA C502	Dry-Barrel Fire Hydrants
AWWA C504	Rubber-Seated Butterfly Valves
AWWA C509	Resilient-Seated Gate Valves for Water Supply Service
AWWA C900	AWWA C900 - Polyvinyl Chloride (PVC) Pressure Pipe and Fabricated Fittings, 4 In. Through 60 In. (100 mm Through 1,500 mm)
AWWA C907	Injection Molded PVC Pressure Fittings, 4 In. Through 12 In. (100 mm Through 300 mm), for Water Distribution
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

3.11 Pavement Marking

3.11.1 Pavement marking material - shall conform to the following standards:

CGSB 1-GP-12.C	Standard Paint Colours
----------------	------------------------

3.11.2 Pavement marking material testing- shall conform to the following standards:

ASTM D256	Test Methods for Determining the Izod Pendulum Impact Resistance of Plastics
ASTM D523	Test Method for Specular Gloss
ASTM D570	Test Method for Water Absorption of Plastics
ASTM D638	Test Method for Tensile Properties of Plastics
ASTM D638-68	Test Method for Adhesion Shear Strength
ASTM D713	Method for Conducting Road Service Tests on Fluid Traffic Marking Materials
ASTM D821	Method for Evaluating Degree of Abrasion, Erosion or a Combination of Both, in road Service Tests for Traffic Paint
ASTM D868	Practice for Determination of Degree of Bleeding of Traffic Paint
ASTM D913	Practice for Evaluating Degree of Traffic Paint Line Wear
ASTM D969	Method of Laboratory Test for Degree of Bleeding of Traffic Paint
ASTM D1214	Test Method for Sieve Analysis of Glass Spheres
ASTM E28	Test Method for Softening Point of Resins from Naval Stores by Ring and Ball Apparatus
ASTM E303	Test Method for Measuring Surface Frictional Properties Using British Pendulum Tester
ASTM E1347	Test Method for Color and Color-Difference Measurement by Tristimulus Colorimetry
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. CONSTRUCTION SAFETY MEASURES

1.1 Observe and enforce construction safety measures required by the Alberta Fire Code, National Building Code 2019 - Alberta Edition, Alberta Occupational Health and Safety Act, Regulation, and Code, and provincial or municipal statutes and authorities.

1.2 The Consultant and 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.

1.3 Practices outlined in the current City's Procedures Manual for On-Street Construction Safety must be implemented by the Consultant and/or Contractor, as applicable, in conjunction with worker training, including but not limited to ensuring 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. The City's Procedures Manual for On-Street Construction Safety is available at:

[Procedures for On-Street Construction Safety](#)

1.4 All work sites are required to have an emergency response plan. The Consultant and/or Contractor, as applicable, shall familiarize all of the workers on the work site of the contents of the plan.

1.5 The Consultant and Contractor shall adhere to any key control system established by the City to protect the work site.

1.6 If the contract involves demolition, hot work, explosives, work over water, asbestos pipe removal, ground thawing, pesticide application, lasers, electrical or substance isolation (blanking, lockouts), radioactive and/or carcinogenic material then the Consultant and Contractor shall follow the requirements set in the Alberta Occupational Health and Safety Act, Regulations, and Code and develop procedures for dealing with these specific safety hazards. These procedures shall be made available to the City upon request. The Consultant and 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.

1.7 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. When mature trees border the site, the Prime Contractor must include Urban Forestry with the City in the coordination and scheduling of the Work.

1.8 Before beginning construction work in any existing City infrastructure, building or premises, the Contractor shall meet with the City to discuss potentially hazardous material on the site. This shall include health hazards of a physical, chemical or biological 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 City representative to have the alleged hazardous materials identified using accepted testing protocols. Authorization by the City to proceed with the Work will be contingent on test results.

1.9 If it is not known if the building materials are hazardous or could contain lead or asbestos and the building(s) was built prior to 1985, then testing of the building material should be conducted to determine if hazardous materials are present.

2. SUBMISSIONS

Prior to the commencement of construction, submit to the City's Health and Safety Coordinator through the Project Manager the following:

2.1 Copies of the Codes of Practice required by the Alberta Occupational Health and Safety Act, Regulation, and Code for work to be performed on this project.

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.

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).

3. RESPONSIBILITIES FOR WORK SITES WITH MORE THAN ONE EMPLOYER

3.1 On all work sites where there is more than one employer or self-employed persons, or one or more employers and one or more self-employed persons involved in work at the work site, the Prime Contractor is responsible to adhere to all obligations of the Prime Contractor set out in the Alberta Occupational Health and Safety Act, Regulations and Code and for:

- i. Ensuring that information is available on all contacts for safety matters as outlined in 1.2.3 above.
- ii. Ensuring that all information provided by the City of Edmonton on safety matters is communicated to all other work site contractors.

3.2 The Consultant, Contractor, and Prime Contractor shall establish and maintain a system or process that will ensure compliance with the Alberta Occupational Health and Safety Act, Regulation, and Code, and the Alberta Fire Code, 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.

4. INSPECTION AND REPORTING

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 a dangerous condition, Section 31, or its equivalent, of the Occupational Health and Safety Act shall be followed. All reports provided by outside agencies, for example Alberta Labour and Immigration, shall be copied to the City within 24 hours following the inspection.

4.2 When an injury or incident occurs that falls under Part 5, Section 40 of the Alberta Occupational Health and Safety Act, or its equivalent, all such injuries and incidents shall be reported by the Contractor as required by the Alberta Occupational Health and Safety Act, Regulation, and Code. 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.

5. PRE-CONSTRUCTION SAFETY MEETING

5.1 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.

5.2 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.

5.3 The City may raise particular aspects of the Occupational Health and Safety Act, Regulation, and Code or related issues considered to be of special importance to the contract at this meeting.

END OF SECTION

PREAMBLE

The following Measurement and Payment section only applies to Work done by the Contractor(s) under a Contract with the City and not to Work done under a Servicing Agreement. The following table outlines the different subsections of the Measurement and Payments Section and which Standards' Volume it references.

Subsection	Pages	Reference to which Standards Volume
1.000 General	35	Volume 2
2.000 Non-Payment Items	35	Volume 2
0.000 General Site Activity	36	Volume 2
10.000 Grading	36	Volume 2
11.000 Pavement and Concrete Removal	37	Volume 2
12.000 Clearing and Grubbing	38	Volume 2
13.000 Trench and Backfill	38	Volume 2
16.000 Granular Material	41	Volume 2
17.000 Gabions	41	Volume 2
18.000 Geotextile Filter Fabric	42	Volume 2
20.000 Concrete	42	Volume 2
30.000 Subgrade Preparation	44	Volume 2
31.000 Cement Stabilized Subgrade	44	Volume 2
33.000 Soil Cement	45	Volume 2
40.000 Asphalt Concrete	45	Volume 2
41.000 Pavement Cold Milling	47	Volume 2
42.000 Pavement Crack Sealing	47	Volume 2
43.000 Slurry Seal	47	Volume 2
50.000 Concrete Curb, Gutter, Walkway, and Slabs	47	Volume 2
51.000 Pavement Markings	50	Volume 2
52.000 Slab Jacking	50	Volume 2
55.000 Concrete Barrier	50	Volume 2
61.000 Water Mains	51	Volume 4
62.000 Valves and Hydrants	53	Volume 4
63.000 Cathodic Protection	54	Volume 4
64.000 Water Services	55	Volume 4
70.000 Install Sewers, Drains, and Culverts by Trenching	56	Volume 3
71.000 Install Sewers by Augering, Boring, Microtunnelling, Pope Jacking, or Pipe Bursting	58	Volume 3
72.000 Sewage Force Main	60	Volume 3
73.000 Manholes, Catch Basin Manholes, Catch Basins, and Shafts	60	Volume 3
74.000 Sewer and Manhole Rehabilitation	61	Volume 3
75.000 Tunnels and Underground Structures	63	Volume 3
76.000 Concrete Box Sewers	64	Volume 3
90.000 Topsoil	64	Volume 5
91.000 Seed and Sod	64	Volume 5
92.000 Trees, Shrubs, and Flowers	65	Volume 5
94.000 Chain Link Fence	70	Volume 5

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 or their designate 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	
1.7	Payment shall be in accordance with the Schedule of Unit Prices appended to the Tender Form.
	<p>Related Contract Provisions</p> <p>Documents in the Contract that are related specifically to payment of work include but are not limited to the following:</p> <ul style="list-style-type: none"> General Conditions of Contract. Bid Form: schedule of quantities and prices. Specifications: Sections applicable to each item of work. Special Provisions.
2.0	Non Payment Items
2.1	<p>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.</p> <ul style="list-style-type: none"> 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

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			
<u>MEASUREMENT</u>				
Cubic metres of excavated material is measured by one of the following methods as determined by the Engineer:				
<ol style="list-style-type: none"> 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: <ol style="list-style-type: none"> (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. 				
<u>FREEHAUL</u>				
For the purposes of determining freehaul, the following definitions apply:				
<ol style="list-style-type: none"> 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: <ol style="list-style-type: none"> (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. <p>(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.)</p> (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. 				

No.	Item	Unit	Payment Includes	Ref.	
10.011	Common Excavation Normal	Cubic Metre	Excavate; separate materials; load; haul the freehaul distance; dump and spread; scarify, trim, cut and fill slopes; place and grade fill material on berm, boulevard, or slope; stockpile salvageable materials; dispose of surplus and unsuitable materials; pay dumping fees if any; drainage protection; dust control; maintain and cleanup haul route. Over excavation due to the Contractor's own fault will not be paid for.	Old: 02310 New: 2.3	
10.012					To location [in SP]
10.013					In lane [see SP]
10.014					In lane [see SP]
10.021	Borrow Excavation	Cubic Metre	Strip topsoil and stockpile; excavate; separate materials; load; haul the freehaul distance; place and grade material on embankment, berm, boulevard or slope; drainage protection; dust control; protect maintain and cleanup haul route.		
10.031	Garbage Excavation	Cubic Metre	Excavate, break and separate materials; load, haul and dispose; pay dumping fees if any; drainage protection; dust control; protect, maintain and cleanup haul route.		
10.041	Overhaul	Cubic Metre	Hauling beyond the freehaul distance.		
10.051	Fill Compaction	Cubic Metre	Spread to required lift thickness; alter soil moisture content as necessary; compact to required density; scarify and recompact fill damaged by any cause. Fill compaction will not be paid for in the following cases, unless stipulated otherwise in the Special Provisions or directed by the Engineer: <ul style="list-style-type: none"> 1. The top layer(s) of the fill designated as subgrade preparation or cement stabilized subgrade as shown on the drawings. 2. Berm construction. 3. Fill on boulevard and behind curb. 4. Fill to restore grade where there is over-excavation due to the Contractor's fault. 		
10.061	Berm Fill	Cubic Metre		S.P.	

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	Old: 02224 New: 2.4
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.
-----	------	------	------------------	------

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.	Old: 02231 New : 2.2
12.012	Clearing	Sq. Metre		
12.021	Clearing & Grubbing	Hectare		
12.022	Clearing & Grubbing	Sq. Metre		

13.000 TRENCH AND BACKFILL					
	Excavate and Backfill Trenches		Excavate trench; supply and place Class B bedding as specified in table 2.1.2; designation 7; class 10; supply imported fill where necessary; backfill and compact; dispose of surplus material.	Old: 02318 02060 New: 3.1 2.1	
	Type 1 Backfill				
	Pipe Size <= 150 mm				
13.011	<2m deep	Lineal Metres			
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	Pipe Size 525 mm <2m deep	Lineal Metre	Excavate trench; supply and place Class B bedding as specified in table 2.1.2; designation 7; class 10; supply imported fill where necessary; backfill and compact; dispose of surplus material.	Old: 02318 02060 New 3.1 2.1
13.072	2 - 3 m deep			
13.073	3 - 4 m deep			
13.074	4 - 5 m deep			
13.075	5 - 6 m deep			
13.076	> 6 m deep			
13.081	Pipe Size 600 mm <2m deep			
13.082	2 - 3 m deep			
13.083	3 - 4 m deep			
13.084	4 - 5 m deep			
13.085	5 - 6 m deep			
13.086	> 6 m deep			
13.091	Pipe Size 675 mm <2m deep			
13.092	2 - 3 m deep			
13.093	3 - 4 m deep			
13.094	4 - 5 m deep			
13.095	5 - 6 m deep			
13.096	> 6 m deep			
13.101	Pipe Size 750 mm <2m deep			
13.102	2 - 3 m deep			
13.103	3 - 4 m deep			
13.104	4 - 5 m deep			
13.105	5 - 6 m deep			
13.106	> 6 m deep			
13.111	Pipe Size 900 mm <2m deep			
13.112	2 - 3 m deep			
13.113	3 - 4 m deep			
13.114	4 - 5 m deep			
13.115	5 - 6 m deep			
13.116	> 6 m deep			
13.121	Pipe Size 1050 mm <2m deep			
13.122	2 - 3 m deep			
13.123	3 - 4 m deep			
13.124	4 - 5 m deep			
13.125	5 - 6 m deep			
13.126	> 6 m deep			
13.131	Pipe Size 1200 mm <2m deep			
13.132	2 - 3 m deep			
13.133	3 - 4 m deep			
13.134	4 - 5 m deep			
13.135	5 - 6 m deep			

13.136	> 6 m deep			
	Pipe Size 1350 mm			
13.141	<2m deep			
13.142	2 - 3 m deep			
13.143	3 - 4 m deep			
13.144	4 - 5 m deep			
13.145	5 - 6 m deep			
13.146	> 6 m deep			

No.	Item	Unit	Payment Includes	Ref.
-----	------	------	------------------	------

13.151	Pipe Size =>1500 mm <2m deep	Lineal Metre	Excavate trench; supply and place Class B bedding as specified in table 2.1.2; designation 7; class 10; supply imported fill where necessary; backfill and compact; dispose of surplus material.	Old: 02318
13.152	2 - 3 m deep			02060
13.153	3 - 4 m deep			New: 3.1 2.1
13.154	4 - 5 m deep			
13.155	5 - 6 m deep			
13.156	> 6 m deep			
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.	Old: 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.	New: 3.1
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.	Old: 02317 New 7.11
13.311	Additional Payment for Fine Granular Bedding	Tonne	Additional payment to supply and place fine granular bedding	Old: 02318
13.312	Additional Payment for Coarse Granular Bedding	Tonne	Additional payment to supply and place coarse granular bedding	02515 New: 3.1
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.	Old: 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.	New: 3.1

No.	Item	Unit	Payment Includes	Ref.
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 2.1.1 and 2.1.2	Old: 02060 New: 2.1
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. Variable: Aggregate designation and class as per Table 2.1.1 and 2.1.2	
16.022	50 mm. gravel 3-20 base 100	Square		
16.023	mm. gravel 3-20 base 150	Metre		
16.024	mm. gravel 3-20 base 200			
16.025	mm. gravel 3-20 base			
16.031	Gravel 3-63 base by weight	Tonne		
16.032	100 mm. gravel 3-63 base	Square		
16.033	150 mm. gravel 3-63 base	Metre		
16.034	200 mm. gravel 3-63 base			
16.035	250 mm. gravel 3-63 base			
16.036	300 mm. gravel 3-63 base			
16.037	450 mm. gravel 3-63 base			
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.	Old: 02060 New: 2.1
16.043	50 mm. gravel 3-20 base 100	Square	Variable: Aggregate designation and class as per Table 2.1.1 and 2.1.2	
16.044	mm. gravel 3-20 base 150	Metre		
16.045	mm. gravel 3-20 base 200			
16.046	mm. gravel 3-20 base			
16.051	3-63 by weight	Tonne		
16.052	3-63 base by weight			
16.053	100 mm. gravel 3-63 base	Square		
16.054	150 mm. gravel 3-63 base	Metre		
16.055	200 mm. gravel 3-63 base			
16.056	250 mm. gravel 3-63 base			
16.057	300 mm. gravel 3-63 base			
16.058	450 mm. gravel 3-63 base			
16.061	Scarify 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.	
16.062	Windrow and restore gravel road	Square Metre	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.	Old: 02373 New: 8.1
--------	---------	-------------	---	--

No.	Item	Unit	Payment Includes	Ref.
-----	------	------	------------------	------

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.	Old: none New: 4.5

20.000	CONCRETE			
20.011	Joint sealant	Lineal	Supply and application of sealant. Supply and placement of filler.	Old: 03055
20.021	Preformed joint filler	Metre	Variable: Filler thickness and depth.	03060 New: 7.1 7.2 03310
20.031	Extra reinforcing bar 10M	Lineal	Supply, cut and place reinforcing or tie bars if ordered in addition to those originally specified in the work item.	Old: 03210
20.032	Extra reinforcing bar 15M	Metre	Variable: Reinforcing or tie bar size.	New 7.12
20.033	Extra tie bar 10M			
20.034	Extra tie bar 15M			
20.041	Extra wire mesh	Square Metre	Supply, cut and place wire fabric if ordered in addition to that originally specified for an item.	Old: 03055 03210 New: 7.1 7.12
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.	Old: 0275 1 0306 0
20.202	150 mm. thick	Square Metre		New 7.5 7.3
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	<p>Extra payment when Class A concrete poured on or before September 30 has attained its specified 7-day minimum strength.</p> <p>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.</p> <p>Variable: Higher strength increments of 5MPa and 10 MPa.</p> <p>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.</p>	Old: 0275 1 0306 0
20.222 20.223	5 MPa high extra strength 10 MPa high extra strength			New 7.5 7.3
20.224	Extra Payment for Type 50 Cement			

No.	Item	Unit	Payment Includes	Ref.
-----	------	------	------------------	------

20.231	Class B Concrete Base By volume	Cubic Metre	<p>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.</p> <p>Variable: Completed base thickness in mm; Road unless lane is specified</p>	Old: 0306 0 02712
20.232 20.233	150 mm. thick 175 mm. thick	Square Metre		New 7.3 7.4
20.241	Additional Payment for Stronger Class B Concrete High early strength	Cubic Metre		<p>Extra payment when Class B concrete poured on or before September 30 has attained its specified 7-day minimum strength.</p> <p>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.</p> <p>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.</p>
20.242 20.243	5 MPa high strength 10 MPa high strength		New 7.3 7.4	
20.244	Extra Payment for Type 50 Cement			
20.251 20.261 20.271	Supply of Concrete Class C mix Class D mix Class E mix	Cubic Metre	Supply materials; design and produce specified class of concrete mix; supply concrete mix to jobsite.	Old: 0306 0 New 7.3
20.252	Additional Payment for Stronger Class C Concrete High early strength	Cubic Metre	<p>Extra payment when Class C concrete poured on or before September 30 has attained its specified 7-day minimum strength.</p> <p>Extra payment for providing a strength higher than that originally specified for Class C concrete. The extra payments are due only if the Engineer</p>	Old: 0306 0 New 7.3

20.253 20.254	5 MPa high strength 10 MPa high strength		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			Old: 0306 0
20.262	High early strength	Cubic Metre	Extra payment when Class D concrete poured on or before September 30 has attained its specified 7-day minimum strength.	New 7.3
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.	

No.	Item	Unit	Payment Includes	Ref.
-----	------	------	------------------	------

	Additional Payment for Stronger Class E Concrete			Old: 0306 0
20.272	High early strength	Cubic Metre	Extra payment when Class E concrete poured on or before September 30 has attained its specified 7-day minimum strength.	New 7.3
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.	

30.000	SUBGRADE PREPARATION			
30.010 30.020	Subgrade Preparation 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	Old: 02335 New 4.1

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	Old: 02342 New 4.2

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				
No.	Item	Unit	Payment Includes	Ref.
	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.	Old: 02713 New 4.4
	For Roads			
33.011	By Weight	Tonne		
33.012	150 mm thick	Square Metre		
33.013	200 mm thick			
33.014	250 mm thick			
	For Lanes			
33.021	By Weight	Tonne		
33.022	150 mm thick	Square Metre		
	Road-mix Soil Cement		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	Old: 02714 New 4.4
33.211	150 mm thick for roads	Square Metre		
33.212	200 mm thick for roads			
33.213	150 mm thick for lanes			

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.	Old: 03060 New 7.3
33.301 33.302	Geotextile fabric woven Geotextile fabric unwoven	Square Metre	See SP and section 4.5.	Old: SP New 4.5
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.

40.000 ASPHALT CONCRETE				
No.	Item	Unit	Payment Includes	Ref.
40.211	Tack Coat	Square Metre	Clean surface of loose and foreign matter; supply and apply specified liquid asphalt; protect and cure coated surfaces.	New 6.1 6.2 6.3 6.4
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	

40.412 40.413	50 mm. Asphalt surface 75 mm. Asphalt surface	Square Metre	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.	6.7
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	Old 02741
40.432 40.433	75 mm. thick in road 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.	New 6.1 6.2 6.3 6.4
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.	
40.452 40.453 40.454	50 mm. average depth 75 mm. average depth 100 mm. average depth	Square Metre		
40.461	In Lane By Weight	Tonne		
40.462 40.463	50 mm. average depth 75 mm. average depth	Square Metre		
40.471 40.472	Miscellaneous Overlay, by weight Lane prefill	Tonne		

No.	Item	Unit	Payment Includes	Ref.
-----	------	------	------------------	------

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.	Old 02966
40.613 40.614	By area, for road By area, for lane	Square Metre per Centimetre		
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.	New 6.11

40.622 40.623	50 mm. thick 75 mm. thick	Square Metre		
40.901 40.902 40.903	Miscellaneous Clean and Patch Joint Asphalt Patch Mix Joint repair asphalt base 600 mm wide	Metre Tonne Tonne	See special provisions. See special provisions See special provisions	S.P.

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.	Old 02961 New 6.6
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 42.020 42.030	Crack rout and seal Lane crack rout and seal Residential crack rout and seal	Lineal Metre	Rout and clean cracks and joints; supply and apply sealant; supply and place blotting sand where required.	Old 02975 New 6.9
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 43.011	Slurry seal type 1 Slurry seal type 2	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	Old 02786 New SP

No.	Item	Unit	Payment Includes	Ref.
-----	------	------	------------------	------

50.000	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.	Old 02770

50.021 50.022 50.023 50.024	150 mm. Curb and Gutter 500x200 mm 500x225 mm 500x500 mm 500x275 mm	Lineal Metre		New 7.2
50.031 50.032	25 mm. Face Increment to 250 mm gutter to 500 mm gutter	Lineal Metre	Supply additional materials and work to provide 25 mm increments to the gutter face height.	
50.033 50.034	50 mm. Height Increment to 150 mm curb to 150 mm mono curb	Lineal Metre	Supply additional materials and work to provide 50 mm increments to the gutter face height.	
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.	
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 50.112 50.113 50.114	Monolithic 1.5 metre Lane/Commercial Crossing 150 mm. Curb Gutter 250x200 mm deep Gutter 250x225 mm deep Gutter 250x250 mm deep Gutter 500x200 mm deep			Old 02770 New 7.2
--------------------------------------	---	--	--	--

50.115 50.116 50.117	Gutter 500x225 mm deep Gutter 500x250 mm deep Gutter 500x275 mm deep Monolithic 1.5 metre Private Crossing 150 mm. Curb			
50.121 50.122 50.123 50.124 50.125 50.126 50.127	Gutter 250x200 mm deep Gutter 250x225 mm deep Gutter 250x250 mm deep Gutter 500x200 mm deep Gutter 500x225 mm deep Gutter 500x250 mm deep 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 50.202	Supply and Install Concrete Pavers 60 mm. thick 80 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	Old 02783
50.211 50.212	Supply Only Concrete Pavers 60 mm. thick 80 mm. thick	Square Metre	Supply concrete pavers; deliver to site and stack at designated location. Variable: Shape and colour	New 7.6
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.	Old 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.	New 7.8

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.	Old 02782 New 7.8
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	Old 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.	New 6.5
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.	Old 02783 New 7.6

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	Old SP New 7.13.

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	Old 02841 New 8.4
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 Remove to stockpile 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.

61.000 WATER MAINS				
	Install New Water Mains by Trenching		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
	PVC			
61.001	150 mm. diameter	Lineal Metre		
61.002	200 mm. diameter			
61.003	250 mm. diameter			
61.004	300 mm. diameter			
61.005	450 mm. diameter			
61.006	600 mm. diameter			
61.007	750 mm. diameter			

61.021	Steel 150 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
61.022	200 mm. diameter			
61.023	250 mm. diameter			
61.024	300 mm. diameter			
61.025	450 mm. diameter			
61.026	600 mm. diameter			
61.027	750 mm. diameter			
61.028	900 mm. diameter			
61.029	1050 mm. diameter			
61.030	1200 mm. diameter			
61.031	1350 mm. diameter			
61.041	Concrete Cylinder 450 mm. diameter			
61.042	600 mm. diameter			
61.043	750 mm. diameter			
61.044	900 mm. diameter			
61.045	1050 mm. diameter			
61.046	1200 mm. diameter			
61.047	1350 mm. diameter			
61.061	Ductile Iron 150 mm. diameter			
61.062	200 mm. diameter			
61.063	250 mm. diameter			
61.064	300 mm. diameter			
61.065	450 mm. diameter			
61.066	600 mm. diameter			
61.067	750 mm. diameter			
61.068	900 mm. diameter			
61.069	1050 mm. diameter			
61.070	1200 mm. diameter			
61.071	1350 mm. diameter			

No.	Item	Unit	Payment Includes	Ref.
61.091 61.092	PVC Hydrant Lead 150 mm. diameter 200 mm. diameter			02511
61.301 61.302 61.303 61.304 61.305 61.321 61.322 61.323 61.324 61.325 61.361 61.362 61.363 61.364 61.365 61.391 61.392	Replace Existing Water Mains by Trenching PVC 150 mm. diameter 200 mm. diameter 250 mm. diameter 300 mm. diameter 450 mm. diameter Steel 150 mm. diameter 200 mm. diameter 250 mm. diameter 300 mm. diameter 450 mm. diameter Ductile Iron 150 mm. diameter 200 mm. diameter 250 mm. diameter 300 mm. diameter 450 mm. diameter PVC Hydrant Lead 150 mm. diameter 200 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.	02511
61.501 61.502 61.503 61.504 61.505 61.506 61.507 61.521 61.522 61.523 61.524 61.525 61.526 61.527 61.528 61.529 61.530 61.531	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 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	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
61.541 61.542 61.543 61.544 61.545 61.546	Ductile Iron 150 mm. diameter 200 mm. diameter 250 mm. diameter 300 mm. diameter 450 mm. diameter 600 mm. diameter			02511

61.547	750 mm. diameter			
61.548	900 mm. diameter			
61.549	1050 mm. diameter			
61.550	1200 mm. diameter			
61.551	1350 mm. diameter			
61.591	PVC Hydrant Lead 150 mm. diameter			
61.592	200 mm. diameter			
61.601	Replace Existing Water Main by Pipe Bursting or Extraction PVC 150 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
61.602	200 mm. diameter			
61.603	250 mm. diameter			
61.604	300 mm. diameter			
61.605	450 mm. diameter			
61.701	Reline Existing Water Main with H.D. Polyethylene 150 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	
61.702	200 mm. diameter			
61.703	250 mm. diameter			
61.704	300 mm. diameter			
61.705	450 mm. diameter			
61.706	600 mm. diameter			
61.801	Abandon Water Main 150 mm. diameter	Lineal Metre	Close off ends of water mains; remove services and fill with sand or sand/cement grout as required.	02511
61.802	200 mm. diameter			
61.803	250 mm. diameter			
61.804	300 mm. diameter			
61.805	450 mm. diameter			

62.000	VALVES AND HYDRANTS			
62.001	Install Buried Valves Gate Valves 150 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
62.002	200 mm. diameter			
62.003	250 mm. diameter			
62.004	300 mm. diameter			
62.005	450 mm. diameter			
62.021	Butterfly Valves 150 mm. diameter			
62.022	200 mm. diameter			
62.023	250 mm. diameter			
62.024	300 mm. diameter			
62.025	375 mm diameter			
62.026	450 mm. diameter			
62.101	Install Valves in Chamber Gate Valves 150 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
62.102	200 mm. diameter			
62.103	250 mm. diameter			
62.104	300 mm. diameter			
62.105	450 mm. diameter			
62.106	600 mm. diameter			
62.107	750 mm. diameter			
62.108	900 mm. diameter			
62.109	1050 mm. diameter			
62.110	1200 mm. diameter			

62.121	Butterfly Valves 150 mm. diameter		
62.122	200 mm. diameter		
62.123	250 mm. diameter		
62.124	300 mm. diameter		
62.125	450 mm. diameter		
62.126	600 mm. diameter		
62.127	750 mm. diameter		
62.128	900 mm. diameter		
62.129	1050 mm. diameter		
62.130	1200 mm. diameter		
62.131	1350 mm. diameter		

No.	Item	Unit	Payment Includes	Ref.
-----	------	------	------------------	------

62.141	Valve Actuators up to 300 mm. diameter			02511
62.142	450 mm. diameter			
62.143	600 mm. diameter			
62.144	750 mm. diameter			
62.145	900 mm. diameter			
62.146	1050 mm. diameter			
62.147	1200 mm. diameter			
62.148	1350 mm. diameter			
62.201	Hydrants new	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
62.202	replacement			

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	Individual Anodes Magnesium 7.7 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
63.102	9.1 kg			
63.103	14.5 kg			
63.121	Zinc 2.3 kg			
63.122	5.5 kg			
63.123	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	Anode Banks Horizontal Offset 4 anodes per	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.	
63.302	bank 6 anodes			
63.303	per bank 8 anodes per bank			

63.304	10 anodes per bank		
63.305	12 anodes per bank		
	Anode Banks Vertical Offset		
63.321	4 anodes per bank		
63.322	6 anodes per bank		
63.323	8 anodes per bank		
63.324	10 anodes per bank		
63.325	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.		
	Install New Water Services	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
64.001	20 mm. diameter			
64.002	25 mm. diameter			
64.003	40 mm. diameter			
64.004	50 mm. diameter			
64.005	100 mm. diameter			
64.006	150 mm. diameter			
64.007	200 mm. diameter			
64.008	250 mm. diameter			
	Install Replacement Water Service, Short Side	Number		
64.101	20 mm. diameter			
64.102	25 mm. diameter			
64.103	40 mm. diameter			
64.104	50 mm. diameter			
64.105	100 mm. diameter			
64.106	150 mm. diameter			
64.107	200 mm. diameter			
64.108	250 mm. diameter			
	Install Replacement Water Service, Long Side	Lineal Metre		
64.201	20 mm. diameter			
64.202	25 mm. diameter			
64.203	40 mm. diameter			
64.204	50 mm. diameter			
64.205	100 mm. diameter			
64.206	150 mm. diameter			
64.207	200 mm. diameter			
64.208	250 mm. diameter			
	Reconnecting Existing Water Services	Number		
64.301	20 mm. diameter			
64.302	25 mm. diameter			
64.303	40 mm. diameter			
64.304	50 mm. diameter			
64.305	100 mm. diameter			
64.306	150 mm. diameter			
64.307	200 mm. diameter			
64.308	250 mm. diameter			

64.401	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.	
64.402				
64.403				
64.404				
64.405				
64.406				
64.407				
64.408				
64.501	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
64.502				
64.503				
64.504				
64.505				
64.506				
64.507				
64.508				

No.	Item	Unit	Payment Includes	Ref.
-----	------	------	------------------	------

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
--------	---------------------------	--------	--	-------

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	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
70.002				
70.003				
70.004				
70.005				
70.006				
70.007				
70.008				
70.009				
70.010				
70.011				
70.012				
70.013				
70.014				
70.021	Unreinforced Concrete Main Line Pipe 250 mm. diameter 300 mm. diameter 375 mm. diameter 450 mm. diameter 525 mm. diameter 600 mm. diameter			
70.022				
70.023				
70.024				
70.025				
70.026				
	PVC Main Line Pipe			

70.030	200 mm. diameter			
70.031	250 mm. diameter			
70.032	300 mm. diameter			
70.033	375 mm. diameter			
70.034	450 mm. diameter			
70.035	525 mm. diameter			
70.036	600 mm. diameter			
70.037	675 mm. diameter			
70.038	750 mm. diameter			
70.039	900 mm. diameter			
	Concrete Catch Basin Leads	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.	02634
70.201	200 mm. diameter			
70.202	250 mm. diameter			
70.203	300 mm. diameter			
	PVC Catch Basin Leads			
70.211	200 mm. diameter			
70.212	250 mm. diameter		Variable: Depths as shown on drawings Class and type of pipe	
70.213	300 mm. diameter			

No.	Item	Unit	Payment Includes	Ref.
-----	------	------	------------------	------

70.301	Abandon Sewers	Lineal Metre	Close off ends of sewers; remove services and fill with sand or sand/cement grout as required.	02535 02634
70.302	200 mm. diameter			
70.303	250 mm. diameter			
70.304	300 mm. diameter			
70.305	375 mm. diameter			
70.306	450 mm. diameter			
70.307	525 mm. diameter			
70.308	600 mm. diameter			
70.309	675 mm. diameter			
70.310	750 mm. diameter			
70.310	900 mm. diameter			
	Corrugated Steel Pipe (C.S.P.) Culvert	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
70.401	300 mm. diameter			
70.402	400 mm. diameter			
70.403	500 mm. diameter			
70.404	600 mm. diameter			
70.405	700 mm. diameter			
70.406	800 mm. diameter			
70.407	900 mm. diameter			
70.408	1000 mm. diameter			
70.409	1200 mm. diameter			
	C.S.P. Culvert Flared Ends	Number	Supply and install flared end; backfill and compact; form finished surface to upper edge of flare.	
70.421	300 mm. diameter			
70.422	400 mm. diameter			
70.423	500 mm. diameter			
70.424	600 mm. diameter			
70.425	700 mm. diameter			
70.426	800 mm. diameter			
70.427	900 mm. diameter			
70.428	1000 mm. diameter			
70.429	1200 mm. diameter			
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.	

	Remove CSP Culvert		Excavate; remove existing culvert pipe and deliver to	02640
--	---------------------------	--	---	-------

70.461	up to 300 mm. diameter	Lineal Metre	designated location or dispose of; replace with compacted backfill if required.	
70.462	400 mm. diameter			
70.463	500 mm. diameter			
70.464	600 mm. diameter			
70.465	700 mm. diameter			
70.466	800 mm. diameter			
70.467	900 mm. diameter			
70.468	1000 mm. diameter			
70.469	1200 mm. diameter			
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
70.801	Sewer Services	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
70.802	100 mm. diameter			
70.803	150 mm. diameter			
70.804	200 mm. diameter			
70.805	250 mm. diameter			

No.	Item	Unit	Payment Includes	Ref.
-----	------	------	------------------	------

71.000	INSTALL SEWERS BY AUGERING BORING, MICROTUNNELLING, PIPE JACKING OR PIPE BURSTING		Measured between outside of driving or receiving pits	
	By Augering/Boring Concrete Main Line Pipe	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
71.001	250 mm. diameter			
71.002	300 mm. diameter			
71.003	375 mm. diameter			
71.004	450 mm. diameter			
71.005	525 mm. diameter			
71.006	600 mm. diameter			
71.007	675 mm. diameter			
71.008	750 mm. diameter			
	PVC Main Line Pipe			
71.020	200 mm. diameter			
71.021	250 mm. diameter			
71.022	300 mm. diameter			
71.023	375 mm. diameter			
71.024	450 mm. diameter			
71.025	525 mm. diameter			
71.026	600 mm. diameter			
71.027	675 mm. diameter			
71.028	750 mm. diameter			
	Concrete C.B. Lead			
71.041	250 mm. diameter			
71.042	300 mm. diameter			
71.043	375 mm. diameter			
	PVC C.B. Lead			
71.061	250 mm. diameter			
71.062	300 mm. diameter			
71.063	375 mm. diameter			
	By Pipe Jacking Concrete Main Line Pipe	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
71.401	450 mm. diameter			
71.402	525 mm. diameter			
71.403	600 mm. diameter			

71.404	675 mm. diameter					
71.405	750 mm. diameter					
71.406	900 mm. diameter					
71.407	1050 mm. diameter					
71.408	1200 mm. diameter					
71.409	1350 mm. diameter					
70.410	1500 mm. diameter and up					
	By Pipe Bursting Concrete Main Line Pipe	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		
71.601	300 mm diameter					
71.602	375 mm diameter					
71.603	450 mm. diameter					
71.604	525 mm. diameter					
71.605	600 mm. diameter					
71.606	675 mm. diameter					
71.607	750 mm. diameter					
71.608	900 mm. diameter					
	PVC Main Line Pipe					02445
71.621	300 mm diameter					
71.622	375 mm diameter					
71.623	450 mm. diameter					
71.624	525 mm. diameter					
71.625	600 mm. diameter					
71.626	675 mm. diameter					
71.627	750 mm. diameter					

No.	Item	Unit	Payment Includes	Ref.
-----	------	------	------------------	------

	High Density Polyethylene (HDPE)						
71.641	300 mm diameter						
71.642	375 mm diameter						
71.643	450 mm. diameter						
71.644	525 mm. diameter						
71.645	600 mm. diameter						
71.646	675 mm. diameter						
71.647	750 mm. diameter						
	By Microtunnelling Concrete Main Line Pipe	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			
71.801	450 mm. diameter						
71.802	525 mm. diameter						
71.803	600 mm. diameter						
71.804	675 mm. diameter						
71.805	750 mm. diameter						
71.806	900 mm. diameter						
71.807	1050 mm. diameter						
	Fibreglass Reinforced Resin Main Line Pipe						
71.821	450 mm. diameter						
71.822	525 mm. diameter						
71.823	600 mm. diameter						
71.824	675 mm. diameter						
71.825	750 mm. diameter						
71.826	900 mm. diameter						
	Steel Main Line Pipe						
71.841	450 mm. diameter						
71.842	500 mm. diameter						
71.843	600 mm. diameter						
71.844	750 mm. diameter						

71.845	900 mm. diameter			
--------	------------------	--	--	--

72.000		SEWAGE FORCE MAIN					
	Install by Trenching						
	Steel						
72.001	150 mm. diameter	Lineal Metre	Supply and install pipe; connect to manholes; C.C.T.V. inspection; infiltration/exfiltration testing; water control and disposal	02531 02535			
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		Variable: Depths as shown on drawings				
72.042	200 mm. diameter						
72.043	250 mm. diameter						
72.044	300 mm. diameter						
72.045	450 mm. diameter						
	By Augering/Boring						
	Steel						
72.201	150 mm. diameter	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			
72.202	200 mm. diameter						
72.203	250 mm. diameter						
72.204	300 mm. diameter						
72.205	450 mm. diameter						

No.	Item	Unit	Payment Includes	Ref.
-----	------	------	------------------	------

	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	
73.102	1200 mm. diameter			

			work to backfill and compact around manhole; remove debris.	
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 73.304 73.305 73.306 73.307 73.308 73.309 73.410 73.411 73.412	Frame and Cover Type K-7 Type 80 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.	

No.	Item	Unit	Payment Includes	Ref.
-----	------	------	------------------	------

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.	02631
--------	-------------------------------	--------	--	-------

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
	Reline Sewer With Cast-in-		Prepare sewers for accepting liner system, incl. flushing	02957

74.101	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	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.	
74.102				
74.103				
74.104				
74.105				
74.106				
74.107				
74.108				
74.109				
74.1010				
74.201	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			
74.202				
74.203				
74.204				
74.205				
74.206				
74.207				
74.208				
74.209				
74.210				
74.301	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		Variable: Type and Condition of line.	
74.302				
74.303				
74.304				
74.305				
74.306				
74.307				
74.308				
74.309				
74.310				

No.	Item	Unit	Payment Includes	Ref.
-----	------	------	------------------	------

74.401	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
74.402				
74.403				
74.404				
74.405				
74.406				
74.407				
74.408				
74.409				
74.410				
74.501	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
74.502				
74.503				
74.504				
74.505				
74.506				
74.507				
74.508				
74.509				
74.510				

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

No.	Item	Unit	Payment Includes	Ref.
-----	------	------	------------------	------

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;	03100 03210 03310

			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	
--	--	--	---	--

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.			
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.			

No.	Item	Unit	Payment Includes	Ref.
-----	------	------	------------------	------

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	Square 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	Square Metre		
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 FLOWERS			
	Coniferous Evergreen Trees	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
92.001	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	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
	Golden Pfitzer juniper			
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	Creeping juniper (750 mm sp.)			
92.057	Creeping juniper (750 mm sp.)			
92.058	Andorra juniper (600 mm sp.)			

92.060	Andorra juniper (750 mm sp.) Compact Andorra juniper 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	Pfizer juniper (600 mm sp.)			
92.073	Pfizer 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.
-----	------	------	------------------	------

92.101	Deciduous Trees 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 elm			
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/White birch (60 mm cal.)			
92.115	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	Pin Cherry (45 mm cal.)			
92.124	Pin Cherry (50 mm cal.)			
	Shubert chokecherry			
92.130	45 mm cal.			
92.131	50 mm cal.			
92.132	60 mm cal.			
	Siberian crabapple			
92.134	45 mm cal.			
92.135	50 mm cal.			
	Thunderchild crabapple			
92.137	45 mm cal.			
92.138	50 mm cal.			
	Gladiator crabapple			
92.140	45 mm cal.			
92.141	50 mm cal.			
92.143	Rosthern crabapple			
	45 mm cal.			
92.145	Emerald Spire crabapple (45 mm cal.)			
92.147	Royalty crabapple (45 mm cal.)			

No.	Item	Unit	Payment Includes	Ref.
-----	------	------	------------------	------

92.148	Patmore 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.			
	Assinboine 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	Balsam poplar (60 mm cal.)			
92.175	Balsam poplar (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	Toba 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	Littleleaf linden (60 mm cal.)			
92.194	Littleleaf linden (75 mm cal.)			
92.195	Snowbird 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. Alpine currant			
92.241	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 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
92.264	1.0 m ht.			
92.265	1.5 m ht.			
92.266	Froebel's spirea 450 mm ht.			
92.267	600 mm ht.			
92.269	Three lobed spirea 450 mm ht.			
92.270	600 mm ht.			
92.271	750 mm ht.			
92.272	Wolf willow 600 mm ht.			
92.273	750 mm ht.			
92.274	Snowberry (450 mm ht.)			
92.275	Virginia creeper (2 years old)			
92.301	Roses 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.	Annuals only allowed on a temporary basis, when maintained by other groups other than the City.	
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			
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

The following Project Management and Coordination section only applies to Work done by contractors under a Contract with the City and not to Work done under Servicing Agreements.

1. CONSTRUCTION SCHEDULE

1.1 Requirements

For one (1) week prior to commencing construction submit a detailed construction progress schedule to the Engineer.

1.2 Format

- 1.2.1 Prepare schedule in the form of a horizontal bar chart.
- 1.2.2 Provide a separate bar for each operation.
- 1.2.3 Provide horizontal time scale identifying the first day of the week.

1.3 Submittals

- 1.3.1 Submit initial schedules within 15 working days after award of contract.
- 1.3.2 Submit four copies. The Engineer will retain three copies.
- 1.3.3 Engineer will review schedule and return one reviewed copy within 10 working days after receipt.
- 1.3.4 Resubmit finalized schedule within five working days after receipt.
- 1.3.5 Submit revised progress schedule when requested by the Engineer.

1.4 Construction Progress Schedule

- 1.4.1 Include the completion sequence of construction activities.
- 1.4.2 Include the dates for the commencement and completion of each major element of construction.
- 1.4.3 Progress shall be reviewed at scheduled meetings.

2. PRE-CONSTRUCTION MEETINGS

- 2.1 The Engineer will arrange pre-construction meetings after the Contract is awarded.
- 2.2 Meetings will be held at the Engineer's office or at an alternate location at or near the site.

3. PROGRESS MEETINGS

- 3.1 Progress meetings will be held on a regular weekly basis or more frequently if requested by the Engineer.
- 3.2 The Contractor is to provide accommodation for progress meetings at or near the site.
- 3.3 The Engineer will give all parties advance notice of meeting dates, times and locations.
- 3.4 The Contractor shall have in attendance the Superintendent, the Project Manager and representatives of the subcontractors if requested by the Engineer.
- 3.5 The Engineer will have the Project Manager or the Resident Engineer in attendance.
- 3.6 The Engineer will take minutes and copies will be distributed to attendees.

END OF SECTION

The following Submittal Procedures section only applies to Work done by contractors under contract with the City and not to Work done under Servicing Agreements.

1. SECTION INCLUDES

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

2. SUBMITTALS

The term days in this table refers to business days.

Section: Paragraph	Item	When	To Whom
2.1 Volume 2 Complete Streets (02060 of the old Volume 2):			
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
6.2 Volume 2 Complete Streets (02065 of the old Volume 2):			
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
4.4 Volume 2 Complete Streets (02713 of the old Volume 2):			
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
6.5 Volume 2 Complete Streets (02781 of the old Volume 2):			
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
7.6 Volume 2 Complete Streets (02783 of the old Volume 2):			
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
8.4 Volume 2 Complete Streets (02841 of the old Volume 2):			
1.3.1	Precast concrete mix design for barrier and minibarrier	14 days prior to delivery	Engineer
6.7 Volume 2 Complete Streets (02963 of the old Volume 2):			
1.2.1	Refinery data on liquid asphalt for each type and source	Prior to contract first use and as requested	Engineering Services
6.9 Volume 2 Complete Streets (02975 of the old Volume 2):			
1.2.1	Manufacturer's data on sealant	7 days prior to use	Engineering Services
7.1 Volume 2 Complete Streets (03055 of the old Volume 2):			
1.3.1	Portland cement mill tests	Once a month	Engineering Services
1.3.2	Fly ash mill tests	Once a month	Engineering Services
7.3 Volume 2 Complete Streets (03060 of the old Volume 2)			
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 Volume 3 EPCOR Drainage:			
2.1.1 2.1.3	Manufacturer's data on drain pipe and geotextile	7 days prior to use	Engineering Services
02640 Volume 3 EPCOR Drainage:			
2.1.1	Manufacturer's data on corrugated steel pipe	7 days prior to use	Engineering Services
02910 Volume 5 Landscaping:			
2.1.2.2	Analysis of topsoil supplied by Contractor	21 days prior to delivery	Engineer
02920 Volume 5 Landscaping:			
2.1.1 to 2.1.3	Manufacturer's data on seed and fertilizer	14 days prior to use	Engineer

3. SHOP DRAWINGS

3.1 General

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.

3.1.2 Until submissions are reviewed, work involving relevant products may not proceed.

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.

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 2003 - Alberta Construction Association.

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.

3.1.6 All shop drawings that are required to be authenticated as per the Practice Standard for Authenticating Professional Documents, APEGA, shall be sealed and signed by a Professional Engineer registered in Alberta.

3.1.7 Unless otherwise specifically directed by the Engineer, make all shop drawing prints in blue or black line on white background.

3.1.8 Submit six copies of all shop drawings.

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.

3.2 Identification

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.

3.3 Coordination

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.

3.4 Timing

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 re-submittal and for placing orders and securing delivery.

3.4.2 In scheduling, allow at least ten working days for the Engineer's review following receipt of the submittal.

3.4.3 Costs of delays occasioned by tardiness of submittals will not be borne by the City.

END OF SECTION

The following Quality Assurance section only applies to Work done by contractors under contract with the City and not to Work done under Servicing Agreements.

1. SECTION INCLUDES

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

2. QUALITY ASSURANCE INSPECTION AND TESTING

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.

2.2 The Engineering Services Section of Integrated Infrastructure Services, or any qualified laboratory designated by the City, will conduct quality assurance testing and plant inspection where necessary.

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.

2.4 Testing will be in accordance with the relevant standards as set out in Chapter 3 - Standards.

2.5 Weekly summaries of test results will be provided to the Contractor at the Engineer's discretion.

3. FACILITIES FOR INSPECTION AND TESTING

3.1 Cooperate with the Engineer and facilitate the conduct of inspections and testing.

3.2 Notify the Engineer sufficiently in advance of operations to allow for inspection.

3.3 Provide safe access to work to be inspected and tested.

3.4 Repair work that is disturbed by inspection and tests.

3.5 Provide storage on site for the testing laboratory's exclusive use to store equipment and cure test samples.

END OF SECTION

The following Quality Control section only applies to Work done by contractors under contract with the City and not to Work done under Servicing Agreements.

1. SECTION INCLUDES

- Quality control inspection and testing by the Contractor.
- Facilities for inspection and testing.

2. QUALITY CONTROL INSPECTION AND TESTING

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 confirms to the requirements specified in the individual sections of this Volume 1 and in the other volumes of the Design and Construction Standards.

2.2 The Contractor is also required for inspections and testings required by laws, ordinances, rules, regulations, and orders of public authorities.

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.

2.4 Testing shall be in accordance with the relevant Standards as set out in Chapter 3 - Standards.

2.5 The Contractor shall provide copies of the test results promptly to the Engineer.

2.6 The Engineer may require further quality control testing at the Contractor's expense if initial results are not satisfactory.

END OF SECTION

The following Temporary Utilities section only applies to Work done by contractors under contract with the City and not to Work done under Servicing Agreements.

1. SECTION INCLUDES

Requirements for utilities used on site during construction.

2. ELECTRICITY

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 power, wiring, distribution boxes and panels, and remove on completion of the Contract.

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

3. WATER

3.1 Provide and pay all costs for all water required for the performance of the Work, in accordance with governing regulations and ordinances. The Contractor must engage with EPCOR Water for any temporary water services required.

3.2 With explicit approval from EPCOR Water, furnish and install all necessary temporary water piping and remove on completion of the Work. Temporary water hoses must undergo flushing, chlorination/disinfection, and testing must occur in accordance with all applicable municipal and provincial standards and guidelines. See Section 02517 – Acceptance Testing Guidelines of the Volume 4 Design and Construction Standards for more information.

3.3 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.

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

4. GAS

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

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

5. HEATING, COOLING, AND VENTILATING

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

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

5.3 Temporary heating, cooling, and ventilating shall be in accordance with all governing regulations and ordinances.

5.4 Temporary heating, cooling, 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.

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

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

6. SANITATION FACILITIES

6.1 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.

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

END OF SECTION

1. SECTION INCLUDES

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

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.

3. FIRE PROTECTION

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

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.

5. FALSEWORK AND TEMPORARY CONSTRUCTION SUPPORTS

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

5.2 On major structures employ a qualified Professional Engineer, registered in Alberta, for the design of temporary works and design in accordance with CSAS269.1.

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.

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

6. SEVERE WEATHER CONSTRUCTION

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

7. CONSTRUCTION WITHIN RESIDENTIAL AREAS

7.1 General

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

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 Consultant and Contractor's name, address, email 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, email address, and telephone number are to be included in the notice.

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 businesses or residences during the course of construction, the Developer or their designate, for Work carried out under Servicing Agreements, or Contractor, for Work carried out under a contract between the Contractor and City, is required to contact EPCOR Water a minimum of three (3) weeks prior to the intended disruption to arrange for appropriate notification to all affected residences and businesses, or to arrange for temporary servicing.

7.4 Providing, Repairing and Maintaining Temporary Utility Services

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

7.4.2 The responsibilities and costs for providing temporary utility services shall be borne by the Developer or Contractor, as applicable, and no extra payment will be allowed.

7.4.3 During construction and warranty periods, the 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, or, if the Engineer deems it suitable, shall charge the Developer for the cost of this work in the case where this work is a part of an executed Servicing Agreement(s).

8. SURVEY

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, or, if the Engineer deems it suitable, shall charge the Developer for the cost of restoring disturbed monuments if the Work is a part of an executed Servicing Agreement(s), unless the Engineer authorizes such disturbance.

8.2 Survey Stakes

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, or, if the Engineer deems it suitable, shall charge the Developer for the cost of restoring disturbed monuments if the Work is a part of an executed Servicing Agreement(s), unless the Engineer authorizes such disturbance.

8.2.1 For contracts between the City and a Contractor, 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.

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.

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. SCOPE

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

2. MAINTENANCE

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.

2.1 Clean-up and Replacement

2.1.1 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.

2.1.2 The Contractor shall collect litter from the site a minimum of twice every 28 days.

2.1.3 Replace plant material that is dead or diseased during regular scheduled maintenance. Should the worksite contain dead plant material, remediation and/or replacement, as applicable, should happen as soon as possible and is required prior to any inspections. Plant material replaced prior to Final Acceptance Certificate must be fully established in order to be accepted. Remove and replace any sod showing growth failure or deterioration.

2.1.4 All replacements shall be shown on the maintenance log, including the reason for replacement(s).

2.1.5 If treating for pests, spray logs are required identifying the pest(s) being treated, the date of treatment, weather, and the type of treatment used.

2.2 Weeding

2.2.1 All planting areas, including shrub beds, tree beds and tree wells are to be kept free of weeds.

2.2.2 Weeds shall be pulled in such a way as to remove the root and not damage the existing plant material.

2.2.3 All project sites are to be weeded a minimum of twice every 28 days and all pulled weeds removed from the site immediately.

2.2.4 The Contractor shall comply with any weed notices issued by the City under the *Weed Control Act*, S.A. 2008, Chapter W-5.1, 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.

2.2.5 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.

2.3 Watering

2.3.1 All trees, shrubs and turf shall be watered as frequently as necessary to maintain optimum soil moisture content for continued growth.

2.3.2 Trees shall be watered individually using a water probe.

2.4 Fertilizing

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

2.5 Pruning

2.5.1 All dead or broken branches shall be removed using approved pruning practices. Disease pruning to use sanitary practices and properly dispose of any diseased material.

2.5.2 Any cuts or wounds on trees shall be treated with approved pruning practices.

2.5.3 Pruning shall be undertaken in such a manner as to preserve the natural character of the plant material. Structural pruning may be required to establish acceptable tree form.

2.6 Mowing

2.6.1 For sod, mow at regular intervals to maintain a grass blade height between 60 mm and 75 mm. Naturalized grasses shall not be mown after establishment.

2.6.2 Do not cut more than 1/3 of blade height at any one mowing.

2.7 MAINTENANCE LOG

2.7.1 Submit a maintenance log for approval to the City at the preconstruction meeting.

2.7.2 Submit a maintenance log to the City with monthly invoicing identifying the maintenance work carried out during the month and the areas in which maintenance activities were performed.

2.7.3 Submit a maintenance log for maintenance work undertaken during the warranty period; include this with the FAC application.

2.7.4 The maintenance log shall contain the following information:

- Watering: Litres/Time/Date/ Location
- Mowing/Trimming: Time/Date/Location
- Fertilizing: Product/Time/Date/ Location
- Plant Material Replacement: Number/Species/Date/Location
- Sod and Seed Maintenance: Square Metres/Date/Location
- Weeding: Date/Location
- Litter Pickup: Time/Date
- Observations

END OF SECTION

1. GENERAL

All works performed and all parties, including but not limited to the Developer, Contractor, Consultant, and Prime Contractor, shall comply with all applicable federal, provincial and municipal laws, bylaws, acts, regulations, standards and codes of practice with respect to protection of the environment.

2. ENVIRONMENTAL PROTECTION

2.1 The Developer shall be responsible for reporting all releases or spills in or about the work site in accordance with all applicable federal and provincial regulations with respect to protection of the environment.

2.2 Where a release or spill in or about the work site (recent or historical) has impacted City property, in addition to meeting the federal and provincial requirements, the Developer shall report the release to the City and provide the City with copies of all reports provided to regulators.

2.3 The Developer shall ensure the design concept enhances sustainability and energy conservation (such as solar orientation, alternate materials that are less energy intensive, sustainable transportation measures, and other alternatives, and associated applicable approval from the City), protects areas designated as Environmental and Municipal Reserve, and minimizes disturbance of undeveloped areas on site.

3. SURPLUS MATERIALS AND WASTE

All work should be done in a manner that supports conservation and recovery of construction and demolition materials (including packaging), optimizes diversion from landfill, and minimizes landfill disposal.

3.1 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.

3.2 Disposal of Waste

3.2.1 Do not bury or burn rubbish and waste materials on site.

3.2.2 Do not dispose of chlorinated water with free chlorine, including but not limited to potable water, concrete wastewater, saw cutting slurry or any water with parameters in excess of the limits in the EPCOR Drainage Bylaw 18100 or City of Edmonton Drainage Bylaw 18093, as applicable, or waste or volatile materials, such as mineral spirits, oil, paint thinner, into waterways, storm or sanitary sewers.

3.3 Surplus Material

3.3.1 Asphalt and Concrete: All waste concrete, soil cement and asphalt shall be broken up as specified in Section 2.4 – Pavement and Concrete Removal, Volume 2 Complete Streets and hauled to the nearest stockpile site or as designated in the Special Provisions.

3.3.2 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 6.6 – Pavement Cold Milling, Volume 2, Complete Streets.

3.3.3 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.

3.3.4 Other Materials: Minimize other waste and surplus materials. Recover or recycle materials where practical. Dispose of all other waste and surplus materials off site.

4. AIR POLLUTION

4.1 Assess and control air emissions from vehicles and equipment and dust caused by traffic or construction that are likely to exceed any applicable federal, provincial and municipal laws, bylaws, acts, regulations, standards and codes of practice.

4.2 Abide by all applicable federal, provincial and municipal laws, bylaws, acts, regulations, standards and codes of practice for the control and management of air pollution. Fires and burning on site is not permitted, unless the authority having jurisdiction has issued a burning permit.

5. NOISE ABATEMENT

5.1 The Contractor is reminded that the noise abatement requirements exist in City bylaws to restrict the levels of noise permissible at various hours in residential, commercial and industrial districts of the City and that penalties exist for violations. Before commencing work, the Contractor may apply in writing to the Manager of the Community Standards Branch 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.

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

6. DRAINAGE

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

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

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

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

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

7. HAUL ROUTES

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

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

7.3 Submit the intended haul routes prior to hauling.

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

7.5 The Engineer reserves the right to further restrict loads that may cause physical damage to the Work or cause spillage of material in transit.

7.6 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.

7.7 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.

7.8 Upkeep

7.8.1 Maintain haul routes fit for hauling.

7.8.2 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.

8. TREES AND PLANTS

The City of Edmonton Corporate Tree Management Policy and Volume 5 Landscaping are to be adhered to for all aspects of this project which impact on existing trees and shrubs. The Developer or Contractor, as deemed by the City, 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.

9. MATERIAL HANDLING

9.1 Material Storage

9.1.1 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.

9.1.2 Storage of more materials than is required for the work on hand is prohibited without prior written permission from the Engineer.

9.1.3 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.

9.1.4 Where approval for storage is provided by the Engineer, storage of hazardous substances will incorporate secondary containment.

9.1.5 Maintain materials and/or equipment required for clean up of potential environmental releases readily accessible on Site.

9.2 Explosives

9.2.1 No explosives of any kind shall be used without written authorization from the Engineer.

9.2.2 If such authorization is obtained, the Contractor shall comply with the Explosives Regulations and Codes under the Occupational Health and Safety Act and all other relevant legislation, including but not limited to the Alberta Fire Code.

10. CLEANING

10.1 CLEANING DURING CONSTRUCTION

10.1.1 Maintain the work, at least on a daily basis, free from accumulations of waste materials and debris.

10.1.2 Remove waste materials, debris and surplus or salvaged material belonging to the Contractor from site.

10.1.3 Repair any damage to City or private property to the Engineer's satisfaction within three days of the damage occurring.

10.1.4 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 monies due to the Contractor.

10.1.5 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.

10.1.6 Use only cleaning materials recommended by manufacturer of surface to be cleaned.

10.1.7 Maintain all erosion and sediment control measures in accordance with the City's Erosion and Sediment Control Guidelines.

10.1.8 Disposal of all wood, including diseased wood, must be in accordance with all bylaws.

10.2 FINAL CLEANING

10.2.1 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.

10.2.2 Remove grease, dust, dirt, stains, labels, fingerprints and other foreign materials, from interior and exterior finished surfaces.

10.2.3 Wash down or broom clean concrete surfaces or asphalt surfaces; rake clean other surfaces of ground.

10.2.4 Remove waste products and debris, and leave the Work area clean and suitable for occupancy by the City.

END OF SECTION

1. AUTHORIZATION

1.1 Authority has been granted to the Manager of Parks and Roads Services through Traffic Bylaw 5590 to control all work occurring on road right-of-way.

1.2 Contractors shall obtain an OSCAM permit at: [OSCAM New Application](#)

OSCAM permits shall be kept up to date by the Contractor. Evidence of an expired permit is not sufficient reason for a Contractor to continue work at a site. Conditions that trigger the requirement of an OSCAM permit, as well as procedures, Traffic Accommodation Plans, fees, and Temporary Crossing Permits are given in the link above.

1.3 If there are trees located on City ROW it must be identified at the time of requesting an OSCAM and tree protection be installed.

1.4 Local Improvement Sites

Locations identified as Local Improvements in the Contract cannot commence construction until a bylaw is passed by City Council.

2. PARKING

2.1 Business or Local Resident

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.

2.1.2 With two (2) business days notice, the Contractor may request Parks and Roads Services to remove a parking restriction on a City roadway to provide alternative on-street parking. **Usually this is not possible on a major roadway or freeway.**

2.2 Contractor Vehicles

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

2.3 ePark Pay Machines

2.3.1 At locations where ePark Pay Machines must be removed, contact Parks and Roads Services with seven business days notice.

2.3.2 Parks and Roads Services shall be contacted five business days in advance to bag ePark Pay Machines. The Contractor must obtain permission from Parks and Roads Services to park employee vehicles and equipment shall at the bagged ePark Pay Machine(s) area. The cost of bagging the ePark Pay Machines will be borne by the Contractor. For each day a ePark Pay Machine is bagged, the Contractor shall bear the cost of compensation for the loss of the ePark Pay Machine revenue to the City's Parks and Roads Services. .

2.3.3 Courtesy parking permits may be issued to local businesses or residents only for the purpose of alternate on-street parking.

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.

2.5 Installation of Temporary No Parking Signs

2.5.1 The installation of Temporary Parking Restriction signs shall be done in accordance with the City of Edmonton's Procedures for On-Street Construction Safety Manual, available at: [Procedures for On-Street Construction Safety](#)

2.5.2 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 Parks and Roads Services.

2.5.3 Parks and Roads Services reserves the right to refuse the temporary installation of “No Parking” signs, and will remove and destroy any unauthorized signs.

3. TEMPORARY ACCESSES TO PRIVATE OR CITY PROPERTIES

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.

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.

4. TRANSIT AND EMERGENCY VEHICLE PRIORITY

The standards and recommended procedures contained in the On-Street Construction Safety Manual must be followed at all times by the Contractor, Consultant, Developer, and all their employees, available at: [Procedures for On-Street Construction Safety](#)

5. PEDESTRIAN AND CYCLIC TRAFFIC

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

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 1.9 metres wide with handrails on both sides. The structure shall be rigid and securely supported.

6. TRAFFIC SIGNALS

Give at least five (5) business days notice to the City’s Parks and Roads Services section to remove, cover, or relocate traffic signals affected by construction.

7. TRAFFIC SAFETY DEVICES AND WORK AREA RESTRICTIONS

The standards and recommended procedures contained in the On-Street Construction Safety Manual must be followed at all times by the Contractor, Consultant, Developer, and all their employees.

8. 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 the start of construction. The notice should be a description of what is taking place, start date, and estimated duration of the project.

END OF SECTION

1. DESCRIPTION

This section sets out the procedures to be observed when constructing crossings of all High Pressure Hydrocarbon Pipelines. This procedure is to be in effect exclusively and may **not** be relaxed on supervisory discretion.

2. REGULATIONS

The following is list of the major regulations applicable to this section, any applicable regulations not included in this list must still be adhered to by all parties:

- Alberta Pipeline Act.
- Alberta Electric Utilities Act.
- Alberta Occupational Health and Safety Act, Regulation, and Code.
- Standards Respecting Pipeline Crossings Under Railways
- Canadian National Railway and Canadian Pacific Railway requirements for pipeline crossings.
- Alberta Transportation requirements for pipeline crossings.
- Canada - Navigable Waters Protection Act
- Alberta Environment requirements for construction in surface waters.
- City of Edmonton Zoning Bylaw 12800.
- National Energy Board Act.

3. DEFINITIONS

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.

3.2 “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).

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

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

3.5 “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.

3.6 “Pipeline Company” means the owners, or their designates, of the High Pressure Pipeline being crossed.

3.7 “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.

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

3.9 “Crossing Agreement” means the agreement between the City and Pipeline Company stating the conditions that must be satisfied for crossing the High Pressure Pipeline right-of-way.

3.10 “Crossing plans” means those drawings depicting the location and management of the proposed crossing and which form a part of the Crossing Agreement.

3.11 “Proximity Agreement” means the agreement between the City and the Pipeline Company stating the conditions that must be satisfied for working in or near the High Pressure Pipeline right-of-way.

3.12 “Pipeline Owner” means the representative of the Pipeline Company who is identified as being responsible for developing and co-ordinating approval of the Crossing or Proximity Agreement.

4. RESPONSIBILITIES

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.

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.

4.3 The Surveyor shall be responsible for staking the crossing and obtaining and recording accurate “as-built” information.

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.

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.

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.

4.7 The Pipeline Inspector will observe and approve crossing activities and document the construction procedures used on the crossing report form.

5. PROCEDURES

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.

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.

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”.**

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”.**

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

“APPROVED FOR CONSTRUCTION”

No construction activity is to commence without a copy of this plan on site that contains a stamp and signature.

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

- Name and phone number of the Pipeline Inspector.
- Special provisions of the Crossing Agreement.
- 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.
- Construction commencement and completion dates.
 - The signature of the Superintendent, Surveyor, Pipeline Inspector and City Inspector.

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

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 Director of Transportation Planning and Design, with Integrated Infrastructure Services at the City.

5.9 Prior to any construction activity in the immediate vicinity of a High Pressure Pipeline right-of-way, the Superintendent will coordinate 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.

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.

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.

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.

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.

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. GENERAL

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 make a locate request to Alberta One Call (Phone 1-800-242-3447), Shaw, Telus and any other buried facility owners, landowners, lessees and property managers for marking utilities.

1.2 Where noted on the construction drawings or noted through Alberta One Call that the construction activity will result in the crossing of a high pressure pipeline, the provisions of Chapter 15 - High Pressure Pipeline Crossing Procedures apply.

1.3 Make arrangements and pay for the temporary relocation of any telecommunications, power, street lights, traffic signals, gas lines or any other underground or overhead utilities should this be necessary as a result of work performed under the Contract or Servicing Agreement.

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.

1.5 The City reserves the right to charge the Developer or the Contractor, as deemed by the City, for the costs associated with the protection, repair and restoration of the existing underground utilities, utility trenches or structures to meet utility companies' or City's standards and other requirements, if the Developer or Contractor, as applicable, fails to do so. These costs shall be deducted from the contract value.

1.6 The Engineer shall be given a copy of correspondence between the Contractor and the utility companies regarding the Work.

2. SEWERS

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.

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. A minimum of four weeks notice must be provided to EPCOR Water Services to allow for the engineering and construction to occur. The design and construction must be executed by EPCOR Water Services or an approved contractor of their choice.

3. WATER MAINS

3.1 For a crossing of an existing water main, a minimum of 1.0m vertical clearance must be maintained when crossing over and under existing water mains. Water mains shall be undisturbed or adequately supported when crossing below.

3.2 Water mains shall not be subjected to differential settlement during or following construction activities.

3.3 All water mains must be exposed by HydroVac prior to crossing. Mains greater than 300mm in diameter must have an EPCOR Water Services representative on-site during HydroVac and crossing activities. Contact EPCOR Water Services a minimum of 72 hours prior to commencing HydroVac activities to arrange for the representative.

3.4 Refer to the Table of Offsets for required horizontal clearances.

4. PETROLEUM AND GAS PIPELINES

4.1 As far as is practical, bore under existing pipelines.

4.2 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.

4.3 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.

4.4 Notify the Engineer, the City of Edmonton Fire Rescue Services and Police Services 48 hours prior to starting any field work.

4.5 Follow closely the provisions of Chapter 15 - High Pressure Pipeline Crossing Procedures.

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

5.1 As far as is practical, bore under H.V.T. lines.

5.2 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.

5.3 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.

5.4 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.

5.5 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.

5.6 If the casing is in tunnel, install backfill grout to fill the entire tunnel cross-section.

5.7 Beyond the ends of the casing, install the sewer in a Type 2 Installation or a higher class if specially designated. Install ordinary backfill compacted to 97% one mold Proctor density.

6. ENTRY INTO UTILITY VAULTS AND MANHOLES

6.1 No unauthorized person or equipment shall be allowed entry into any valve chamber, utility vault or manhole. If entry into such chamber, 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.

6.2 When temporary removal of a chamber or manhole lid is required for adjustment or other work, do not leave the chamber or manhole open while unattended. Provide adequate protection and cover if it becomes necessary to leave the chamber or manhole unattended without its lid in place. The chamber or manhole must remain covered while construction activities are occurring in the vicinity to prevent debris from entering into the chamber or manhole.

7. 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.

8. 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.

9. OVERHEAD POWER LINES

9.1 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 and shall follow the requirements set out by the Alberta Occupational Health and Safety Act, Regulation, and Code. The safe limit of approach distances from overhead power lines for persons and equipment provided in those regulations shall be strictly observed.

9.2 Prior to working on easements containing high voltage electrical power lines the Contractor shall contact the utility operator to confirm proposed working methods and limits of approach.

9.3 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.

10. STREET FURNITURE

10.1 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.

10.2 The Contractor must ensure that no modifications, blocking physical or visual obstructions, or other disturbances of traffic signals or to access to pedestrian push buttons occur on site without prior approval of Traffic Operations.

11. HYDRANT PERMIT AGREEMENT

11.1 EPCOR Water Services and the Wastewater Treatment Bylaw 17698 requires Contractors to obtain a hydrant permit agreement in order to draw water from a hydrant. If water is needed at a job site, apply for a hydrant use permit from EPCOR Water Services at least five (5) business days beforehand. Call EPCOR Water Services at (780) 412-3003 for information.

11.2 Pay all fees, deposits, fines, water use charges and any other charges pursuant to EPCOR Water Services and Wastewater Treatment Bylaw 17698.

END OF SECTION