TENDER DOCUMENTS

Town of Whitecourt

2025 Street Improvement Program

Prepared for:
Town of Whitecourt
5004 – 52 Avenue, Box 509
Whitecourt AB, T7S 1N6

Prepared by:
Stantec Consulting Ltd.
1100, 4900 50 Street
Red Deer, AB., T4N 1X7

116239550

April 29, 2025

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INVITATION TO TENDER

Town of Whitecourt

1. A digital Tender in PDF format submitted via email with the subject line **" 2025 Street Improvement Program",** shall be directed to:

   Attention: Kent House, Infrastructure Services Engineer

   email: **kenthouse@whitecourt.ca**

2. Tenders will be received until **Wednesday, May 20, 2025 at 2:00 PM (MST).** Tenderers are to confirm receipt of the digital submission via email or telephone with the individual noted above. Tenders received and not conforming to the foregoing will be returned to the Tenderer without being considered. A tender or any amendments received via facsimile will not be accepted.

   Tenders shall be opened virtually at 3:00 PM (MT) on May 20, 2025 via an online meeting hosting platform. If interested in attending the virtual opening, please email Kent House at kenthouse@whitecourt.ca.

   The Work comprises of, but is not limited to, approximately:

   - Roadway Paving 9,893 m^2
   - Utility Cuts c/w valve or manhole adjustment 8 each
   - Concrete Sidewalks, Swales, Curb and Gutter 293 l.m.
   - Catchbasin Adjustments c/w frame and cover 3 each
   - Other Misc. Concrete 200 m^2

3. The Tender Documents will **only** be distributed electronically in digital format (pdf format) through COOLNet and Alberta Purchasing Connection (APC).

4. The Work described in the Contract Documents and outlined in the Schedule of Prices shall be completed by **September 15, 2025**, including all required landscaping and cleanup work.

5. There shall be no pre-tender meeting for this project.

6. Tenders shall be submitted as digital PDF via email. Tender submissions must include:

   (a) The Tender Form and Supplementary Tender Form;

   (b) Bid Bond or Certified Cheque in the amount of 10% of the Tender Price;

   (c) Consent of Surety; and

(d) Copy of Current COR Safety Certificate or Temporary Letter of Certification.

(e) Addenda Acknowledgement

7. The Owner may decide, at its sole discretion, that no Tender submitted will be accepted and no Contract will be awarded pursuant to this Invitation to Tender. In that event, all Tenderers will be notified, and the Owner will have no liability to any Tenderer, whether legal or equitable.

8. The Owner reserves the right to waive a bid to any party that is or has been engaged in litigation or arbitration with the Owner, or has outstanding debt owed to the Owner. This shall include any contract where the party is acting as a prime contractor or as a sub-contractor.

9. If the Owner decides to accept a Tender and award a Contract, the selection of the Tenderer will be based on a number of criteria being, price, delivery date, and qualifications of the Tenderer.

10. Any successful Tenderer shall be the Prime Contractor for the Project pursuant to the applicable construction safety legislation and shall have primary responsibility for the safety of all workers and equipment on the Project in accordance with such legislation.

11. Written inquiries regarding this Project (no later than 72 hours prior to submission deadline) shall be directed to:

Kent House, Infrastructure Services
Engineer
kenthouse@whitecourt.ca

INSTRUCTIONS TO TENDERERS

DOCUMENT 00100

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PART 1 - UNDERSTANDING OF THE TENDER DOCUMENTS

1.1 DEFINITIONS

The following capitalized words and terms as used throughout the Contract Documents shall mean the following:

(a) "CHANGE ORDER" shall mean a written communication issued by the Owner, with the agreement of the Contractor, setting forth the authorized amount and time to be added to or deducted from the Contract Price on account of changes in the Work described by a Notice of Contemplated Change and subsequent correspondence;

(b) "CONSTRUCTION COMPLETION CERTIFICATE" shall mean a certificate issued by the Engineer upon full completion of the Work, including cleanup and rectification of all deficiencies;

(c) "CONTRACT" shall mean the Contract to be signed by the Owner and the successful Tenderer if any a copy of which is attached;

(d) "CONTRACT DOCUMENTS" shall mean the Invitation to Tender, the Tender, the Contract, the Performance Bond, the Labour and Materials Payment Bond, the Certificate of Insurance and any Addenda, drawings, Field Orders or Change Orders;

(e) "CONTRACT PRICE" shall mean the total amount of the Contract as defined in the Contract, adjusted during the course of the Work as required by a Change Order;

(f) "CONTRACTOR" shall mean a party or firm that signs a Contract with the Owner;

(g) "CONTRACTOR'S SUPERINTENDENT" shall mean an employee or representative of the Contractor who is specifically authorized to be in full charge of the Contractor's operations at the Worksite and is so designated in writing by the Contractor to the Owner;

(h) "ENGINEER" shall mean Stantec Consulting Ltd. or such other engineering firm as may from time to time be duly authorized and appointed in writing by the Owner to act for the purposes of this Contract within the authority and responsibility defined in the Contract Documents;

(i) "FIELD ORDER or F.O." shall mean a written communication from the Owner, or from the Engineer on behalf of the Owner, to the Contractor, clarifying the Contract Documents, issuing additional instructions, requesting information, or ordering a change in the Work within the general scope of the Work;

(j) "FINAL CERTIFICATE" shall mean the certificate issued by the Engineer on behalf of the Owner, after expiry of the Warranty Period, provided that the terms of the Contract have been met;

(k) ”LANDS” shall mean the lands upon which the Work is to be constructed as outlined on the drawings attached hereto;

(l) “MATERIAL” shall mean collectively all materials and commodities required to be furnished under the Contract for the Work except those specifically provided for otherwise in the Contract Documents;

(m) “NOTICE OF CONTEMPLATED CHANGE or NCC” shall mean a written communication from the Engineer, on behalf of the Owner, describing a change in the Work and requesting a quotation, complete with a narrative description of the details of the work to be done by the Contractor to achieve the intent of the contemplated change;

(n) “OTHER CONTRACTOR” shall mean any person, firm or corporation employed by the Owner on the site of the Project other than through the Contractor;

(o) “OWNER” shall mean the Town of Whitecourt;

(p) “OWNER REPRESENTATIVE” shall mean an employee of the Owner or an employee of Stantec Consulting Ltd., specifically designated in writing by the Owner to have special responsibilities and authorities as set out in the Contract Documents;

(q) “PLANT” shall mean collectively all tools, implements, machinery, vehicles, structures, equipment and other things required for the execution of the Work, and provided by the Contractor;

(r) “PRODUCT” shall mean assembled components specifically provided for the Work and standard items such as motors and pumps designed and produced for a specific use;

(s) “PROGRESS PAYMENT CERTIFICATE” shall mean a claim for payment for work done, prepared by the Contractor, reviewed and certified by the Engineer, upon which payment on account is made periodically by the Owner;

(t) “PROVIDE” shall mean “supply and install” or “supply labour and materials for the installation of”. It does not mean supply only;

(u) “QUOTATION FOR CONTEMPLATED CHANGE or QCC” shall mean a written proposal by the Contractor to the Owner for doing the work required to achieve the contemplated change, including both cost and time implications for doing the work;

(v) “SUBCONTRACTOR” shall mean a person neither contracting with nor employed directly by the Owner for doing any of the Work, but contracting with or being employed directly by the Contractor, provided however that the term Subcontractor shall not include one who merely supplies Material or Product for the Work to the Contractor;

(w) “TENDER” shall mean a Tenderer’s written response to this Invitation to Tender in accordance with the tender form attached hereto;

(x) “TENDERER” shall mean the person or firm responding to this Invitation to Tender;

(y) “THE PROJECT” shall mean the total construction contemplated by the Owner, of which the Work may be the whole or only a part;

(z) “THE WORK” shall mean the entirety of the work described in these Contract Documents, including Material, Product, labour, Plant, transportation and other facilities and items ancillary to the foregoing required to furnish and perform the Contract by the Contractor in accordance with the intent of the design as expressed in the Contract Documents;

(aa) “WARRANTY PERIOD” shall mean the period beginning on the date specified in the Construction Completion Certificate, and ending two (2) year after all conditions of the Contract have been met, and the specified period has expired; and

(bb) “WORKSITE” shall mean the spatial limits within which the Work is located, during the period of performance of the Work from the date of Notice to Proceed to the date of the Construction Completion Certificate.

1.2 TENDERING CONDITIONS

.1 The Tendering Period shall end at the time and date specified in the "Invitation to Tender," or at an extended time and date specified in an Addenda.

.2 After a Tender has been received pursuant to paragraph 1.1 in the “Invitation to Tender”, but before the expiry of the Tendering Period specified in Paragraph 1.2, in the “Invitation to Tender” the Tenderer may withdraw or amend its Tender but only in accordance with the following procedure by delivering to the address specified in paragraph 1.1 notice of the withdrawal or amendment in writing.

1.3 INFORMATION CONCERNING CONDITIONS OF THE WORK

.1 Tenderers shall carefully examine the Contract Documents and should visit the Worksite, and shall fully inform themselves as to all existing conditions and limitations which will affect the performance of the Contract.

.2 In preparation of a Tender, Tenderers shall use only those drawings listed in the Contract Documents that are clearly labeled "ISSUED FOR TENDER". Tenderers shall not rely on any documents that are not so labeled.

.3 Discussions at Tender briefings or other oral discussions shall not become a part of the Contract Documents nor modify the Contract Documents unless confirmed by Addenda issued to all Tenderers before closing.

1.4 ADDENDA

.1 If there are to be any changes in the Work, Tenderers will be informed, prior to the close of the period allowed for receiving Tenders, by means of an Addendum, a written communication issued by the Owner. All Addenda shall become a part of the Contract Documents, and receipt of Addenda shall be acknowledged by the Tenderer in the Tender.

.2 Addenda will not be issued later than 48 hours before the Tender closing date.

1.5 DISCREPANCIES, OMISSIONS AND CONSTRUCTABILITY

.1 If a Tenderer finds discrepancies or errors or omissions in the drawings, specifications, or other documents or has any doubt as to the meaning or intent of any part thereof, he shall at once inform the Owner in writing. Any necessary changes, or additions, or further explanations, will be made by the Owner by issuing an Addendum.

.2 Every request for an interpretation shall be made in writing, and forwarded to the address given on the Invitation to Tender. Oral discussions, unless confirmed in writing in an Addendum, shall not modify the Contract Documents nor the tendering procedure.

.3 The Tenderer is responsible for gaining an understanding of the intent of the design as conveyed by the Contract Documents, adequate to allow the Tenderer to prepare a compliant Tender. The Tenderer shall be responsible for determining that the Work is capable of being completed in accordance with the intent of the design and Contract Documents.

PART 2 - TENDER SUBMISSION

2.1 SUBCONTRACTORS

.1 The Tenderer shall submit in the Tender the names of Subcontractors proposed for the work.

.2 Where the Schedule of Subcontractors in the Tender shows specific items of work the Tenderer shall name his Subcontractor or if the work will not be subcontracted he shall so indicate using the words "Own Forces".

.3 The Subcontractors listed in the Tender may not be changed without the written consent of the Owner. If the Owner so requires, the Tenderer shall be prepared to confirm to the Owner the competence of Subcontractors prior to their acceptance on the Work.

2.2 SUPPLIERS AND MANUFACTURERS

.1 The Tenderer should submit in the Schedule of Suppliers and Manufacturers of Material and Product, the names of Manufacturers, and if Material and Product are

obtained through intermediate agents, the agents shall be indicated as the Suppliers.

.2 The Suppliers and Manufacturers named in the Tender shall not be changed without the written consent of the Owner.

2.3 TENDER SECURITY

.1 The Tender shall be accompanied by a Bid Bond in the amount of **ten (10)** percent of the Contract Price proposed in the Tender and a Consent of Surety. The Bid Bond and Consent of Surety shall be provided in an acceptable form by an agency that is acceptable to the Owner, and licensed in the jurisdiction of the project. Alternatively, in substitution for the Bid Bond the Tenderer may provide a certified cheque for the **ten (10)** percent of the Contract Price proposed in the Tender.

.2 The purpose of the Bid Bond or certified cheque as above shall be that if the Owner accepts a Tender and the Tenderer refuses to sign the Contract and to provide the specified performance security, then the Bid Bond or certified cheque are for the benefit of the Owner.

.3 In the event that the Owner's damages arising from the default of the Tenderer in failing to perform the Contract after acceptance of its Tender are greater than the amount of the Tender Security, such Security shall not be construed to limit or eliminate the Owner's right to sue for the balance of its damages or for all of its damages and that right may be exercised by the Owner in its sole discretion.

2.4 ACCEPTANCE AND REJECTION OF TENDERS

.1 The Owner reserves the right to reject any or all Tenders, to waive irregularities and informalities at his discretion and to accept the Tender which the Owner deems to be in its best interest. The lowest Tender will not necessarily be accepted. Without limiting the generality of the foregoing, any Tender may be rejected for any of the following reasons:

- Incomplete Tender.
- Obscured or irregular erasures or corrections in the Schedule of Prices.
- Prices omitted or unbalanced.
- Insufficient or irregular Tender Guarantees.
- Evidence of inadequate experience, or of inadequate capacity to perform the contract, or failure to qualify under conditions of the Tendering Requirement.
- Evidence of previous failure to perform adequately on similar work.
- The insertion by the Tenderer of conditions which vary the Tendering Requirements or the Tender Forms.

.2 The Owner reserves its right to negotiate at the time of acceptance, with the lowest Tenderer only, for a lower Tender Price, or for the removal from the Tender of qualifying conditions, or both.

PART 3 - CONSTRUCTION AND SURVEY

3.1 CONSTRUCTION SPECIFICATIONS

.1 The Tenderer must identify a Construction Manager in Section 00400. The requirements for the Construction Manager are listed in Section 01030 Special Project Procedures.

.2 The construction specifications that will govern the work on this project are detailed in the Tender drawings as well as in this document. Refer to the latest version of the Town of Whitecourt Construction Specifications document for any construction specifications, which are not detailed elsewhere.

3.2 MATERIAL TESTING AND CONSTRUCTION SURVEY

.1 A geotechnical sub-consultant will be retained by the Owner to provide quality assurance testing on the project. As outlined in Section 01400 the Contractor will be responsible for their quality control testing. Refer to Section 00800 regarding provision of Construction Survey.

3.3 CONSTRUCTION COMPLETION

.1 The construction completion is outlined in T-6, Section 00304. Timing is essential for the contract and the schedule must be adhered to.

3.4 MANDATORY QUALIFICATION REQUIREMENTS

.1 The bidder shall supply the name of a proposed construction manager. The construction manager shall have a minimum of **ten (10)** years of related construction experience. The construction manager shall be available to meet on site within 60 minutes of an issue being identified. The construction manager need not be the bidder’s superintendent.

.2 The bidder shall supply the name of a proposed construction foreman. The construction foreman shall have a minimum of **eight (8)** years of related construction experience. The bidder shall supply **three (3)** references for the named construction foreman for projects of similar scope. The construction foreman listed shall be onsite full time for the entire duration of construction.

END OF DOCUMENT 00100

EXISTING SITE CONDITIONS

DOCUMENT 00230

1.1 EXISTING SITE CONDITIONS

.1 Tenderers should visit the Worksite and examine site conditions. Tenderers may make tests, inspections and measurements, but such investigations must be performed under time schedules and arrangements with the Owner and Tenderers must comply with the Owner's requirements.

END OF DOCUMENT 00230

TENDER FORMS

DOCUMENT 00304

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1. CONTRACTOR

Name _____

Address _____

_____

2. OWNER

Name Town of Whitecourt
Address 5004 – 52 Avenue, Box 509
Whitecourt, Alberta T7S 1N6

3. PROJECT DESCRIPTION

Town of Whitecourt - 2025 Street Improvement Program

4. BASIS OF THE TENDER

.1 The Contractor has carefully examined the Contract Documents for the construction of the Work.

.2 The Contract Documents are an integral part of this Tender.

.3 The Contractor has examined the Worksite and understands the conditions under which the Work is to be performed. The Contractor has satisfied himself that the Work is capable of being performed.

.4 The Contractor offers to furnish all of the Material and Product (except as otherwise specified to be supplied by others), together with all of the labour, Plant and transportation to perform the Work described in the Contract Documents, in the manner prescribed therein, for the prices quoted in the Schedule of Prices, and in accordance with the other Schedules in this Tender.

.5 Where Prime Cost Sums for provision of Material or Product are included in the Schedule of Prices, only actual expenditures made upon the written authority of the Owner, shall be paid out of these Prime Cost Sums, and if a Prime Cost Sum is not sufficient to cover that component of the Work, then the Contract Price shall be increased, and if the Prime Cost Sum is greater than required, the Contract Price shall be decreased.

.6 Prime Cost Sums shall include the net cost of the item, applicable taxes and duties and delivery to the Site. Prime Cost Sums shall not include handling at the site, protection, installation or overhead and profit. Allowance for handling, protection, installation, overhead and profit shall be made by the Contractor in his tendered prices for installation. The tendered prices for installation will not be adjusted if the actual cost of the Prime Cost item has increased or decreased from the Prime Cost Sum in the Tender.

.7 Where a Contingency Allowance is included in the Schedule of Prices, only actual expenditures for increases in the quantities and changes in The Work, made upon the written authority of the Owner, will be paid out of such allowance, and the Contract Price will be changed in the amount by which the Contingency Allowance either exceeds or is exceeded by such expenditures.

.8 The estimated quantities of work are approximate only and are subject to increase or decrease, and whether the quantities are increased or decreased, the unit prices stated in the Schedule of Prices shall apply, and the Contract Price shall be adjusted accordingly.

.9 If a discrepancy is found between a Unit Price and an Amount, the Unit Price shall be considered as representing the intention of the Contractor, and the Owner will recalculate the Amount. The addition of the Amounts will be corrected and a corrected Tender Amount and Contract Price will be established.

.10 If a discrepancy is found between the sum of the corrected Amounts and the Tender Price shown, the sum of Amounts, as corrected shall be deemed to represent the intent of the Tenderer.

.11 If a discrepancy is found between a Lump Sum Price and the corresponding Breakdown Prices, the Lump Sum Price shall be considered as representing the intention of the Contractor.

.12 No action of the Owner other than sending a "Notice of Acceptance" in writing to the Contractor, shall constitute acceptance of a Tender.

5. SCHEDULE OF PRICES

It should be noted that the Owner may award any or all of the Schedules dependent on the available funding. The Owner reserves the right to award Schedules after the Contract Date by Change Order.

The Contractor offers the following Schedule of Prices for performance of the Contract.

TENDER SUMMARY

SCHEDULE A – OVERLAY WORK _____

SCHEDULE B – CONCRETE (30MPa) _____

TENDER SUBTOTAL _____

G.S.T. (5%) _____

TOTAL TENDER AMOUNT _____

ITEM	DESCRIPTION	TENDER QUANTITY	UNIT	UNIT PRICE	EXTENSION
	UNIT PRICE SCHEDULE A - OVERLAY WORK				
PART A1. GENERAL REQUIREMENTS					
.1	Mobilization and Demobilization	1	l.s		
.2	Traffic Accomodation Plan, Signage, and Detouring	1	l.s		
PART A2. ASPHALT PAVEMENT REMOVAL					
A2.1	***Cold Milling - 50mm Depth***				
.1	- Sunset Boulevard & Feero Drive + Sunset Boulevard & Baxter Cr	0	m2		
.2	- Whitecourt Ave & McLeod Dr	0	m2		
.3	- Sunset Boulevard & 42 Ave (Traffic Circle)	435	m2		
.4	- Dahl Dr (52 Ave - 55 Ave)	4570	m2		
.5	- 52 Ave (Tim Hortons Intersection)	578	m2		
.6	- 49Ave & 47 St	960	m2		
.7	- Localized Pavement Failures - 50mm depth	0	m2		
A2.2	***Cold Milling - 100mm Depth***				
.1	- Sunset Boulevard & Feero Drive + Sunset Boulevard & Baxter Cr	2250	m2		
.2	- Whitecourt Ave & McLeod Dr	1100	m2		
.3	- Sunset Boulevard & 42 Ave (Traffic Circle)	0	m2		
.4	- Localized Pavement Failures - 100mm depth	10	m2		
A2.3	***Gutter Mill - 2 m Width - 0mm to 50mm***				
.1	Gutter Mill - 2 m Width - 0mm to 50mm	200	m2		
PART A3. ASPHALT CONCRETE PAVEMENT (ACO)					
A3.1	***75 mm Overlay***				
.1	- Sunset Boulevard & Feero Drive + Sunset Boulevard & Baxter Cr	2250	m2		
.2	- Whitecourt Ave & McLeod Dr	1100	m2		
	50mm Overlay				
.3	- Sunset Boulevard & 42 Ave (Traffic Circle)	435	m2		
.4	- Dahl Dr (52 Ave - 55 Ave)	4570	m2		
.5	- 52 Ave (Tim Hortons Intersection)	578	m2		
.6	- 49Ave & 47 St	960	m2		
.7	- Localized Pavement Failures - 50mm depth	0	m2		
A3.2	***100 mm Overlay (Two 50 mm Lifts)***				
.1	- Sunset Boulevard & Feero Drive + Sunset Boulevard & Baxter Cr	0	m2		
.3	- Whitecourt Ave & McLeod Dr	0	m2		
.4	- Localized Pavement Failures - 100mm depth	10	m2		
A3.3	***Asphalt Leveling Course***				
.1	- Fill as required	60	tonne		
A3.4	***Asphalt Prime and Tack Coat***				
A3.4.1	*Tack Coat at a rate of 0.5 litres/m2*				
.1	- Whitecourt Ave & McLeod Dr	1100	m2		
.2	- Sunset Boulevard & Feero Drive + Sunset Boulevard & Baxter Cr	2250	m2		
.3	- Sunset Boulevard & 42 Ave (Traffic Circle)	435	m2		
.4	- Dahl Dr (52 Ave - 55 Ave)	4570	m2		
.5	- 52 Ave (Tim Hortons Intersection)	578	m2		
.6	- 49Ave & 47 St	960	m2		
.7	- Localized Pavement Failures - 50mm depth	50	m2		
.8	- Localized Pavement Failures - 100mm depth	10	m2		
A3.4.2	*Prime Coat at a rate of 1.0 litres/m2*				
.1	- Whitecourt Ave & Mcleod Dr	1100	m2		
.2	- Sunset Boulevard & Feero Drive + Sunset Boulevard & Baxter Cr	2250	m2		
.3	- Sunset Boulevard & 42 Ave (Traffic Circle)	435	m2		
.4	- Dahl Dr (52 Ave - 55 Ave)	4570	m2		
.5	- 52 Ave (Tim Hortons Intersection)	578	m2		
.6	- 49Ave & 47 St	960	m2		
.7	- Localized Pavement Failures - 100mm depth	10	m2		

ITEM	DESCRIPTION	TENDER QUANTITY	UNIT	UNIT PRICE	EXTENSION
PART A4. ROADWAY UTILITY CUT RESTORATIONS (ASPHALT PAVEMENT C/W BASE PREPARATION AND VALVE OR FRAME ADJUSTMENT)					
A4.1	***Minor utility cut restoration, smaller than 10 m2***				
.1	- Manhole frame & cover, typical 3m x 3m pavement patch	5	ea.		
.2	- Water main valve adjustment, typical 3m x 3m pavement patch	3	ea.		
.3	- Small Valve Patch, typical 1 m x 1 m (Patching around CC or valve)	0	ea.		
PART A5. BACKALLEY APRON					
.1	- Backalley Apron with 50 mm Overlay c/w base preparation, typical 6m x 6 m	7	ea		
PART A6. BASE Reconstruction					
.1	- Whitecourt Ave & Mcleod DR - 150mm Subgrade Prep, 150mm Granular Base Course, Geotextile	1100	m2		
.2	- Sunset Blvd and Feero Dr - 150mm Subgrade Prep, 150mm Granular Base Course, Geotextile	2250	m2		
PART A7. Thermoplastic Line Painting					
.1	- Zebra Crosswalk (White, 3 m long and 600 mm wide)	53	l.m.		
.2	- White Stop Bar (Solid White, 300 mm wide)	43	l.m.		
.3	- Centreline (Solid Yellow, 100 mm wide)	98	l.m.		
.4	- Lane Divider (Dashed White, 100 mm wide)	525	l.m.		
.5	- Left Turn Arrow	7	ea.		
.6	- Single Directional Arrow	12	ea.		
.7	- Double Directional Arrow	7	ea.		
	TOTAL SCHEDULE A				

ITEM	DESCRIPTION	TENDER QUANTITY	UNIT	UNIT PRICE	EXTENSION
	UNIT PRICE SCHEDULE B - CONCRETE (30 MPa)				
PART B1. GENERAL REQUIREMENTS					
.1	Mobilization and Demobilization	1	l.s		
.2	Traffic Accomodation Plan, Signage, and Detouring	1	l.s		
PART B2. ROADWAY, SIDEWALK AND DRAINAGE IMPROVEMENTS					
B2.1	***Sidewalk and Walkway Improvements***				
.1	- Sawcut, remove and dispose existing monolithic sidewalk	98	l.m		
.2	- Supply and install monolithic sidewalk RF or SF	98	l.m		
.3	- Sawcut, remove and dispose existing separate sidewalk	9	m2		
.4	- Supply and install separate sidewalk or walkway connector	19	m2		
.5	- Sawcut, remove and dispose existing pararamp	10	ea		
.6	- Supply and install pararamp	11	ea		
.7	- Sawcut, remove, and dispose of existing concrete slab	0	m2		
.8	- Supply and install concrete slab - 120mm depth	65	m2		
B2.2	***Drainage Improvements***				
.1	- Sawcut, remove and dispose existing concrete curb & gutter	33	l.m		
.2	- Supply and install concrete curb and gutter	33	l.m		
.3	- Sawcut, remove, and dispose of existing concrete swales	62	l.m		
.4	- Supply and install 1.5 m concrete swale - 120mm depth, c/w 20mm granular base - 200mm depth	62	l.m		
.5	- Catchbasin Adjustment c/w frame and cover	3	ea		
B2.3	***Concrete Patching***				
.1	- Supply and install concrete patch around cc or valve, typical 1 m x 1 m	1	ea		
B3.1	***Bulk Pricing for 55th Ave Sidewalk***				
.1	- Install 240m of Monolithic sidewalk	240	l.m.		
.2	- Swales at 39St and 41St	45	m		
PART B4. DRIVEWAY ENHANCEMENT PROGRAM					
.1	Sawcut, remove and dispose existing sidewalk, curb and gutter, and/or pararamp at residential driveway crossing	22	m2		
.2	Supply and install residential driveway crossings	90	m2		
	TOTAL SCHEDULE B				

SUMMARY OF UNIT PRICE SCHEDULES

UNIT PRICE SCHEDULE "A" - OVERLAY WORKS

UNIT PRICE SCHEDULE "B" - CONCRETE

TOTAL OF TENDER

SUMMARY OF UNIT PRICE SCHEDULES

UNIT PRICE SCHEDULE "A" - OVERLAY WORKS _____

UNIT PRICE SCHEDULE "B" - CONCRETE _____

TOTAL OF TENDER _____

6. SCHEDULE OF COMPLETIONS

.1 The designated portion of the Work is described as follows:

(a) The Work described in the Contract Documents and outlined in the Schedule of Prices shall be completed by **August 15, 2025** including all required landscaping and cleanup work.

.2 There shall be no exclusion of time from the Designated Completion Period for any reason other than delays clearly attributable to the Owner, its agents, employees or any other authorized representatives.

.3 Construction Completion will be issued upon completion and will have a full 2-year warranty period from the date of the CCC. Construction Completion for roadway work, paving, concrete works, landscaping restoration to be completed in its entirety including all deficiencies.

.4 Time is of the essence in this Contract, and in the event that the Work is not completed within the periods described above, the Contractor shall be responsible for all damages accruing to the Owner due to late completion. Liquidated damages as identified in Section 00500 Item 3 shall be applied in the event of delayed completion.

7. SCHEDULE OF ADDENDA

.1 The Contractor states that he has received the following Addenda which have been considered and taken into account in determining the Prices tendered in the Schedule of Prices. The Addenda are issued by or in behalf of the Owner.

Addendum Number	Date Issued	Number of Pages

8. PERFORMANCE GUARANTEE AND INSURANCE CERTIFICATE

.1 After receipt of Notice of Acceptance, the Contractor shall provide a Performance Bond in the amount of 50% of the Contract Price and a standard Labour and

Materials Payment Bond in the amount of 50% of the Contract Price and the Bonds shall remain in effect for the duration of construction and the Warranty Period.

.2 The bonds shall be in a form that is acceptable to the Owner and shall be supplied by an agency that is acceptable to the Owner and that is licensed in the jurisdiction in which the Work is located.

.3 In the event that a Security Deposit is provided in lieu of a Performance Bond, the Security Deposit shall be retained to the end of the Warranty Period.

.4 After receipt of Notice of Acceptance, the Contractor shall provide the required Insurance Certificate.

.5 The costs of bonds and insurance shall be borne by the Contractor.

.6 No Progress Payments shall be made until the required Bonds or Security Deposit and Insurance Certificate have been delivered to the Owner.

9. AGREEMENT

.1 The Contractor shall sign and return the Agreement within 14 calendar days after receipt of the Notice of Acceptance.

10. NOTICE TO PROCEED

.1 After acceptance, the Owner will issue a "Notice to Proceed" and the date specified in this Notice shall be the date of commencement entered into the Agreement.

.2 The Contractor shall not enter onto the Worksite nor commence work before the date of commencement specified in the "Notice to Proceed."

.3 A "Condition Precedent" to performance of the Contract is the passing of a Referendum after the Contract has been awarded to establish a Contract Price. If the Referendum fails to pass a Notice to Proceed cannot be issued and the Contract will then be terminated.

11. PERIOD OF IRREVOCABILITY

This Tender is irrevocable for **60 days** after the Tender Closing

Date. Tender Closing Date: **Wednesday, May 19, 2025, 2:00 PM**

Local Time.

12. SIGNATURES

Contractor Name: _____

Legal Status (Circle One): Corporation Partnership Sole Ownership

Mailing Address: _____

_____

Names, addresses, and positions of corporation officers or members of the organization:

Member 1	**Member 2**	**Member 3**
_____ Name	_____ Name	_____ Name
_____ Address Line 1	_____ Address Line 1	_____ Address Line 1
_____ Address Line 2	_____ Address Line 2	_____ Address Line 2
_____ Position	_____ Position	_____ Position

SIGNED, SEALED AND DELIVERED BY:

Signature of Witness	**Signature of Contractor** (Corporate Seal Here)
_____ Signature	_____ Signature
_____ Address Line 1	_____ Address Line 1
_____ Address Line 2	_____ Address Line 2

END OF DOCUMENT 00304

SUPPLEMENTARY TENDER FORMS

DOCUMENT 00400

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1. CONTENT OF SUPPLEMENTARY TENDER FORMS

.1 The Contractor warrants that all of the information given in these Schedules is current and correct.

.2 Upon acceptance by the Owner, all Schedules in the Supplementary Tender Forms shall become a part of the Contract Documents.

.3 Table of Schedules:

SCHEDULE OF BREAKDOWN PRICES
SCHEDULE OF UNIT PRICES FOR PROVISIONAL WORK ITEMS
SCHEDULE OF FORCE ACCOUNT RATES
SCHEDULE OF CONTRACTOR'S QUALIFICATIONS
SCHEDULE OF EQUIPMENT
SCHEDULE OF CONTRACTOR'S SUPERVISORY PERSONNEL
SCHEDULE OF SUBCONTRACTORS
SCHEDULE OF MANUFACTURERS/SUPPLIERS OF MATERIAL AND PRODUCT

2. SCHEDULE OF BREAKDOWN PRICES

.1 The Contractor offers the following Schedule of Breakdown Prices to be used as a basis for progress payments. The Contractor understands that the Owner may refuse to accept any breakdown which he considers to be unbalanced and may require an adjustment to correct any such imbalance, without changing the Total Contract Price tendered.

Item Number	Description and/or Specification	Lump Sum Amount

3. SCHEDULE OF UNIT PRICES FOR PROVISIONAL WORK ITEMS

.1 The Contractor offers the following Schedule of Unit Prices to be used as information for the specific provisional work items listed. Actual expenditures for provisional work made upon the written authority of the Owner will be paid out of the Provisional Cost Sum changes negotiated in the Unit Prices shall not change the provisional cost sum tendered.

Item No.	Description	Unit	Unit Price

4. SCHEDULE OF FORCE ACCOUNT RATES

.1 The Contractor offers to do force account work for the following rates for personnel and equipment. These force account rates shall not exceed that of ARHCA (Alberta Roadbuilders & Heavy Construction Association) rates. In the event that they do, ARHCA rates shall govern. Equipment rates include operator, fuel, maintenance, profit and overhead. Personnel rates include payroll cost of labour, all payroll burdens, room and board, if applicable, overhead and profit. The cost of superintendents, time keepers, and other administrative and supervisory personnel and their vehicles are included in overhead. The cost of Bonding and Insurance is included in overhead.

.2 The Contractor understands that the Owner may review these Force Account Rates and require changes for good cause.

EQUIPMENT:

Description and Make	Model and Size	Hourly Rate

PERSONNEL:

Occupation Or Trade	Hourly Rate	Overtime Rate

5. SCHEDULE OF CONTRACTOR'S QUALIFICATIONS

.1 The Contractor states that the following is a true account of his qualifications and experience on work similar to the Work.

Work	Year	Construction Cost	Owner/Engineer

6. SCHEDULE OF EQUIPMENT

.1 The Contractor states that the equipment listed or its equivalent shall be available for the Work on this Contract.

Description of Unit	Size or Capacity	Condition	Age	Present Location

7. SCHEDULE OF CONTRACTOR'S SUPERVISORY PERSONNEL

.1 The Contractor states that the following supervisory personnel shall be employed on this Contract.

Name	Position	Experience

8. SCHEDULE OF SUBCONTRACTORS

.1 The Contractor states that the following Subcontractors shall be utilized on this Contract:

Items of Work	Subcontractor

9. SCHEDULE OF MANUFACTURERS/SUPPLIERS OF MATERIAL AND PRODUCT

.1 The Contractor states that the following Manufacturers/Suppliers of Material and Product shall be utilized for the major supply items on this Contract.

Item	Supplier	Manufacturer

Item	Supplier	Manufacturer

END OF DOCUMENT 00400

AGREEMENT

DOCUMENT 00500

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1. PARTIES TO THE CONTRACT AND DATE OF THE AGREEMENT

This Agreement made in triplicate on the _____ day of _____, 2025 by and between:

Town of Whitecourt

Hereinafter called the "OWNER", and

_____
(Contractor Name)
Hereinafter called the "CONTRACTOR"

The OWNER and the CONTRACTOR agree as follows:

2. SCOPE OF THE WORK

.1 The Contractor agrees to furnish all of the Material and Product (except as otherwise specified to be supplied by others) together with all of the equipment, labour and transportation necessary to perform entirely the Work as described in the Contract Documents entitled:

2025 Street Improvement Program

.2 The Contract Documents have been prepared by Stantec Consulting Ltd. And include all documents listed in the "Contents of the Contract Documents." The Contract Documents are an integral part of this Agreement.

.3 In preparing these Contract Documents, Stantec Consulting Ltd. has relied on information or work product provided by the Owner or by others on behalf of the Owner, and Stantec Consulting Ltd. does not warrant or guarantee the adequacy or reliability of such information or work product.

3. COMPLETION DATES

.1 The Work to be performed under this Contract shall commence on the date specified in the “Notice to Proceed”. Components shall be completed and the Work in its entirety shall be fully completed, including clean-up and rectification of all deficiencies, within the time allotments specified in Document 00304, Paragraph T-6.1, “Schedule of Completions”.

.2 Time is of the essence of this Agreement and in the event that the Work is not completed as specified, the Contractor shall become liable for any added engineering expense and any other costs incurred as damages to the Owner. The amount of such damages may be deducted from any monies due the Contractor.

.3 If the Contractor fails to perform the services within the time specified in the Contract, the Contractor agrees to pay to the Town of Whitecourt (The Town), liquidated damages in the amount of $1,000 for each calendar day of delay.

4. PAYMENT

.1 The Owner shall pay the Contractor in Canadian currency for the performance of the Contract at the Prices named in the Tender, and subject to the conditions set forth in the Contract Documents.

5. CONTRACT PRICE

.1 The Contract Price shall be $_____ (plus GST) which shall be subject to additions or subtractions as provided in the Contract Documents.

6. PERFORMANCE GUARANTEES

.2 The Contractor hereby deposits with the Owner a Performance Bond in the amount of 50% of the Contract Price and a Labour and Materials Payment Bond in the amount of 50% of the Contract Price.

7. WRITTEN NOTICE

.1 Written notice shall be deemed to have been duly served if delivered in person to the individual, or to a member of the firm, or to an officer of the corporation for which it is intended; or sent by double registered mail to its business address.

.2 Written Notice must be served to:

The OWNER:

Town of Whitecourt
5004 – 52 Avenue, Box 509
Whitecourt, Alberta T7S 1N6

The CONTRACTOR:

_____
Contractor Name

_____
Street Address

_____ _____ _____
Town Province Postal Code

8. SIGNATURES

IN WITNESS WHEREOF the Parties hereto have executed this Agreement, the day and year first above written.
SIGNED, SEALED, AND DELIVERED in the presence of:

CONTRACTOR

Company Name

Company Address

Signature of Authorized Signing Officer 1	Signature of Authorized Signing Officer 2
Name of Officer 1	Name of Officer 2
Title of Officer 1	Title of Officer 2
Witness Signature 1	Witness Signature 2

CORPORATE SEAL

OWNER

Name

Address

Signature of Authorized Signing Officer 1	Signature of Authorized Signing Officer 2
Name of Officer 1	Name of Officer 2
Title of Officer 1	Title of Officer 2
Witness Signature 1	Witness Signature 2

CORPORATE SEAL

END OF DOCUMENT 00500

BONDS AND CERTIFICATES

DOCUMENT 00600

STANTEC CONSULTING LTD.

CERTIFICATE OF INSURANCE

This is to certify that the insurances as described herein have been arranged for the insured named herein on whose behalf this Certificate is executed, and we hereby certify that such insurances are in full force and effect.

NAME OF INSURED _____

ADDRESS OF INSURED _____

INSURANCE COVERAGE PROVIDED

1. COMPREHENSIVE GENERAL LIABILITY INSURANCE covering property damage and contractual liability.

Policy No.	_____	Insurer	_____
Date Effective	_____	Date of Expiration	_____
Limits of Liability	_____	Each Person	_____
		Each Occurrence	_____
		Aggregate Cover	_____
		Inclusive Limits	_____

2. AUTOMOBILE INSURANCE covering all vehicles owned, operated, leased or hired.

Policy No.	_____	Insurer	_____
Date Effective	_____	Date of Expiration	_____
Limits of Liability	_____	Each Person	_____
		Each Accident	_____
		Inclusive Limits	_____

3. COURSE OF CONSTRUCTION INSURANCE either All Risks Builders Risk Policy or (Specify)

_____

Policy No. _____ Insurer _____

Date Effective _____ Date of Expiration _____

Limits of Liability _____

If any of the policies described herein are changed in any manner, for any reason during the period of coverage as stated herein, so as to effect this Certificate, or if any of the policies are cancelled or terminated, **15 days** written notice shall be given to the Owner and to the Engineer prior to such change, cancellation or termination becoming effective.

This Certificate is executed and issued to the Owner the day and date written below.

OWNER: Town of Whitecourt DATE: _____

ADDRESS: 5004 – 52 Avenue, Box 509
Whitecourt, Alberta T7S 1N6

NAME OF AGENT OR BROKER: _____

ADDRESS: _____

NAME OF AUTHORIZED OFFICIAL: _____

SIGNATURE OF AUTHORIZED OFFICIAL: _____

END OF SECTION 00600

GENERAL CONDITIONS

DOCUMENT 00700

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1. DEFINITIONS

.1 The contents of the Contract Documents are limited to:

Contract Forms:

- the TENDER Forms
- the Supplementary TENDER Forms
- Notice of Acceptance
- the AGREEMENT
- the Performance Bond
- the Labour and Materials Payment Bond
- the Certificate of Insurance;

Conditions of the Contract:

- the General Conditions
- the Supplementary General Conditions;

Drawings;

Specifications;

Appendices;

Addenda;

Field Orders;

Change Orders.

.2 The following definitions shall apply throughout the Contract Documents:

(a) "PROVIDE" shall mean supply and install.

(b) “CHANGE ORDER” shall mean a written communication issued by the Owner, with the agreement of the Contractor, setting forth the authorized amount and time to be added to or deducted from the Contract PRICE on account of changes in The Work described by a Notice of Contemplated Change and subsequent correspondence.

(c) “CONSTRUCTION COMPLETION CERTIFICATE” shall mean a certificate issued by the Engineer upon full completion of The Work, including cleanup and rectification of all deficiencies.

(d) “CONTRACT PRICE” shall mean the total amount of the Contract as defined in the Agreement, adjusted during the course of The Work as required by these Contract Documents.

(e) “CONTRACTOR'S SUPERINTENDENT” shall mean an employee or representative of the Contractor who is specifically authorized to be in full charge of the Contractor's operations at the Worksite and is so designated in writing by the Contractor to the Owner.

(f) “ENGINEER” shall mean Stantec Consulting Ltd. or such other engineering firm as may from time to time be duly authorized and appointed in writing by the Owner to act for the purposes of this Contract within the authority and responsibility defined in the Contract Documents.

(g) “FIELD ORDER” or “F.O.” shall mean a written communication from the Owner, or from the Engineer on behalf of the Owner, to the Contractor, clarifying the Contract Documents, issuing additional instructions, requesting information, or ordering a change in The Work within the general scope of The Work.

(h) “FINAL CERTIFICATE” shall mean the certificate issued by the Engineer on behalf of the Owner or by the Owner, only at the request of the Contractor, after expiry of the Warranty Period, provided that the conditions of the Contract have been met.

(i) “MATERIAL” shall mean collectively all materials and commodities required to be furnished under the Contract for The Work except those specifically provided for otherwise in the Contract Documents.

(j) “NOTICE OF CONTEMPLATED CHANGE” or “NCC” shall mean a written communication from the Engineer, on behalf of the Owner, describing a change in The Work and requesting a quotation, complete with a narrative description of the details of the work to be done by the Contractor to achieve the intent of the contemplated change.

(k) “OTHER CONTRACTOR” shall mean any person, firm or corporation employed by the Owner on the site of The Project other than through the Contractor.

(l) “OWNER REPRESENTATIVE” shall mean an employee of the Owner or an agent of the Owner, specifically designated in writing by the Owner to have special responsibilities and authorities as set out in the Contract Documents.

(m) “PLANT” shall mean collectively all tools, implements, machinery, vehicles, structures, equipment and other things required for the execution of The Work, and provided by the Contractor.

(n) “PRODUCT” shall mean collectively machinery or assembled components specifically provided for The Work and standard Product such as motors, pumps, etc. designed and produced for a specific use.

(o) "PROGRESS PAYMENT CERTIFICATE" shall mean a claim for payment for work done, prepared by the Contractor, reviewed and certified by the Engineer, upon which payment on account is made periodically by the Owner.

(p) "QUOTATION FOR CONTEMPLATED CHANGE" or "QCC" shall mean a written proposal by the Contractor to the Owner for doing the work required to achieve the contemplated change, including both cost and time implications for doing the work.

(q) "SUBCONTRACTOR" shall mean a person neither contracting with nor employed directly by the Owner for doing any of The Work, but contracting with or being employed directly by the Contractor, provided however that the term Subcontractor shall not include one who merely supplies Material or Product for The Work to the Contractor.

(r) "SUBSTANCIAL COMPLETION" shall mean The Work under a Contract or Subcontract is:

i) Is capable of completion or correction at a cost of no more than:

ii) Ready or substancially ready for use for the intended purpose; and

iii) three percent (3%) of the first $500,000.00 of the Contract or subcontract price,

iv) two percent (2%) of the next $500,000.00 of the Contract or subcontract price, and

v) one percent (1%) of the balance of the Contract or subcontract price.

(s) "THE PROJECT" shall mean the total construction contemplated by the Owner, of which The Work may be the whole or only a part.

(t) "THE WORK" shall mean the entirety of the work described in these contract documents, including Material, Product, labour, Plant, transportation and other facilities and items ancillary to the foregoing required to furnish and perform the Contract by the Contractor in accordance with the intent of the design as expressed in the Contract Documents.

(u) "WARRANTY PERIOD" shall mean the period beginning on the date specified in the "CONSTRUCTION COMPLETION CERTIFICATE," and ending after all conditions of the Contract have been met, and the specified period has expired.

(v) "WORKSITE" shall mean the spatial limits within which The Work is located, during the period of performance of The Work from the date of Notice to Proceed to the date of the Construction Completion Certificate.

.3 Words importing the singular only shall also include the plural and vice-versa, where the context requires.

.4 Material, Product, Plant or methods described in words which so applied have a well-known technical or trade meaning shall be held to refer to such recognized meaning.

2. AGREEMENT

.1 The Agreement shall be signed in triplicate by the Owner and the Contractor.

3. DRAWINGS AND INSTRUCTIONS

.1 The Owner will furnish to the Contractor 10 working copies of the Contract Documents.

.2 A current set of the complete Contract Documents, in good order, shall be kept at the Worksite and shall be available there to the Engineer and the Owner.

.3 All drawings, specifications and copies thereof furnished by the Engineer are his property. They shall not be used on other work and, with the exception of the signed Contract Document set, are to be returned to the Engineer on request, upon completion of The Work.

.4 All models prepared by the Engineer for the Owner's use and paid for by the Owner, are the property of the Owner, and not the Contractor, unless specifically agreed otherwise.

4. REFERENCE POINTS AND LAYOUT

.1 The Engineer will establish base lines and reference points, for the location of principal components of The Work, as well as bench marks in reasonable proximity to The Work.

.2 The Contractor shall be responsible for protection and preservation of bench marks, reference points and stakes, and legal survey pins, and in case of willful or careless destruction, he shall be charged with the resulting expense and shall be responsible for any mistakes that may be caused by their loss or disturbance.

.3 The Contractor shall provide all detailed layout of dimensions, locations, and elevations of The Work from the base lines, reference points, and bench marks set by the Engineer.

.4 The Contractor shall not proceed with The Work until he has received from the Engineer such base lines, reference points, elevations, and other points and instructions as are required for the execution of The Work.

.5 The Contractor shall, before commencing work at any point, satisfy himself as to the meaning and correctness of all stakes and instructions. No claims shall be considered for any allowance based on alleged inaccuracies, failure to read reference points correctly, or failure to interpret instructions correctly.

.6 If the Contractor, in the course of executing The Work, finds any discrepancy between the drawings and the physical conditions of the locality, or any errors, omissions or discrepancies in drawings or in the layout as given by points and instructions, he shall inform the Owner immediately in writing, and the Owner or the Engineer shall promptly verify the same and issue appropriate instructions. Any work done after discovery of errors, omissions or discrepancies, before further work is authorized, will be done at the Contractor's risk.

.7 The Town will provide a baseline survey of The Work in addition to the provisions of General Condition 4.1. The Contractor shall be responsible for all other survey associated with the Work and the Engineer will provide the required digital files.

.8 Construction and layout stakes including laths, hubs, flagging, markers, and nails shall be provided by the Contractor.

5. THE ENGINEER AND THE CONTRACTOR

.1 The Town shall provide only general engineering services for The Work, including periodic visits to the Worksite to observe the progress of The Work and general conformance to the intent of the design.

.2 The Engineer shall provide full time resident services at the Worksite and general engineering services for The Work.

.3 The duties, responsibilities and limitations of authority of the Engineer are defined in the Contract Documents and they may not be changed except with the written consent of the Owner, the Contractor and the Engineer. They are delegated to the Engineer by the Owner.

.4 The efforts of the Engineer shall be directed to reviewing construction progress, providing interpretation of the Contract Documents, where required, and assisting in the expeditious carrying out of The Work.

.5 The Engineer does not guarantee the Contractor's work nor undertake to check the quality and quantity of work on behalf of the Contractor. The Engineer is not responsible to the Contractor for discovering defects in The Work nor for advising the Contractor of defects in The Work.

.6 The Contractor shall bring to The Work the expertise, skill and experience required for the execution of The Work.

.7 During the course of execution of The Work, if the Contractor becomes aware of any error, discrepancy or omission in the drawings or the specifications, the

Contractor shall immediately notify the Engineer in writing and request instructions. The Contractor shall not proceed any further with that portion of The Work until he has received such instructions in writing from the Engineer.

.8 The Engineer may, by Field Order, put a "hold" on any portion of The Work while an error, discrepancy or omission, whether discovered by the Contractor or the Engineer, is investigated. Such a "hold" order shall not constitute a basis for a claim by the Contractor for delay, unless and until it critically affects the performance of The Work and the Schedule for Completion of The Work.

The Contractor shall designate, in writing, a Contractor's Project Manager who shall have authority to issue Quotations for Contemplated Change, sign Change Orders, attend meetings on and off the Worksite, give instructions to the Contractor's Superintendent all on behalf of the Contractor and generally represent the Contractor with respect to the Contract.

.9 The Contractor shall have complete control of The Work and shall direct and supervise The Work to ensure conformance with the intent of design as expressed in the Contract Documents. The Contractor shall be solely responsible for construction means, methods, techniques, sequences and procedures, and for coordinating the various aspects of The Work under the Contract. The Contractor shall have determined that The Work is constructible.

.10 The Contractor shall have the sole responsibility for the design, erection, operation, maintenance and removal of temporary structures and other temporary facilities, and for the design and execution of methods required in their use.

.11 When required by law or by the Contract, the Contractor shall engage and pay for registered professional engineering personnel to perform the design of temporary facilities and methods of execution to ensure safety and satisfactory performance.

.12 When required by the Specifications or drawings, the Contractor shall submit to the Engineer a written description and Drawings to show its proposed methods and means for doing certain specified items of The Work. These submissions allow the Engineer to act on the Owner's behalf to:

(a) determine the general conformance of the proposed means and methods with the intent of the design;

(b) determine whether there are or could be any serious effects of a permanent nature on The Work, the Worksite, or the contiguous area outside the Worksite.

.13 The Owner, or the Engineer acting on the Owner's behalf, are permitted but not obligated to comment, give approval or withhold approval of the proposed means and methods.

.14 The Owner may stop the Contractor from implementing the proposed means and methods by issuing a Field Order.

.15 The Contractor shall employ a competent Contractor's Superintendent who shall be in attendance at the Worksite while The Work is being performed. The Contractor's Superintendent shall be acceptable to the Owner and shall not be removed or changed without good reason, and then only with the approval of the Owner.

.16 The Contractor's Superintendent shall represent the Contractor at the Worksite and additional instructions given to him by the Engineer shall be deemed to have been given to the Contractor.

.17 Nothing contained in the Contract Documents shall be construed to form any contractual obligation between the Engineer and the Contractor.

6. SUBCONTRACTORS

.1 The Contractor shall preserve and protect the rights of the Owner with respect to all work performed under the Contract and shall:

(a) Require all Subcontractors to perform work in accordance with and subject to the terms and conditions of the Contract;

(b) Be as fully responsible to the Owner for acts and omissions of Subcontractors and of persons directly or indirectly employed by them as for acts and omissions of persons directly employed by the Contractor;

(c) Incorporate all terms and conditions of the Contract Documents into all Subcontract Agreements he enters into with his Subcontractors, insofar as they are applicable.

.2 The Contractor shall employ those Subcontractors proposed in the Schedule of Subcontractors for portions of The Work designated and as accepted by the Owner prior to Acceptance of the Tender.

.3 Nothing contained in the Contract Documents shall create any contractual obligation between any Subcontractor and the Owner.

7. OTHER CONTRACTORS

.1 The Owner reserves the right to let other contracts on the Worksite related to the Project and to do work with his own forces on the Project.

.2 The Owner shall coordinate the work, insurance coverages, and compliance of Other Contractors with rules and procedures for the Worksite insofar as these affect The Work of this Contract.

.3 The Contractor shall coordinate his work with that of Other Contractors and tie into works constructed by others as specified or shown in the Contract Documents.

.4 The Contractor shall report to the Owner or the Engineer any apparent deficiencies in Other Contractors' work which would affect The Work of this Contract as soon as they come to his attention and shall confirm such report in writing. Failure by the Contractor to so report shall invalidate any claims against the Owner by reason of the deficiencies of Other Contractors' work except as to those of which the Contractor could not reasonably be aware.

.5 The Contractor is responsible for coordination and scheduling the work of others including, but not limited to, the following: power, telephone, cable television, gas, and the Town of Whitecourt. All coordination and management aspects of the project are considered incidental to the Contract.

8. ASSIGNMENT

.1 Neither Party to the Contract shall assign the Contract or any portion thereof, nor any monies due to either Party, without the written consent of the other; which consent shall not be unreasonably withheld.

9. INDEMNITY

.1 The Contractor shall indemnify and hold harmless the Owner, the Engineer, OTHER Contractors and any and all representatives or employees of the Owner, from and against all third party actions, claims, demands or suits, or payments, losses, judgment or expenses arising out of or in consequence of the acts, omissions or negligence of the Contractor in performing The Work during the period of performance of The Work and during the Warranty Period.

.2 In the event of such a third party action, claim, demand or suit, the Owner shall give written notice thereof to the Contractor and the Contractor shall thereupon defend against or otherwise dispose of the same, and shall pay any losses, judgments and expenses promptly after they are determined.

.3 If the Contractor fails, refuses or neglects to defend, or otherwise dispose of such third party action, claim, demand or suit, within reasonable time and within legal time constraints, the Owner may dispose of such action, claim, demand or suit on such terms as the Owner, in his sole discretion, shall deem reasonable. The Contractor shall thereupon, and forthwith, pay to the Owner the sums paid out by the Owner and all reasonable costs incurred by the Owner in disposing of the matter, including the Owner’S legal costs on the Solicitor and Client basis.

.4 The obligation of the Contractor to indemnify the Owner shall not apply to liability arising out of acts, omissions or negligence of the Owner, the Engineer, OTHER Contractors or any other representative or employee of the Owner.

10. DISPUTE RESOLUTION

.1 The Engineer shall, in the first instance, interpret the Contract and make any determinations for which he is responsible and which he is authorized to make under the Contract. Should either the Contractor or the Owner dispute the written interpretation or determination made by the Engineer in the first instance, that party shall, within six (6) calendar days of receiving the determination or interpretation, submit to the Engineer a written notice of his dispute setting out all of the relevant details.

The Owner shall make the final decisions on interpretations regarding time extension, extra payments and liquidated damages

.2 Upon receipt of a Notice of Dispute, the Engineer shall immediately notify in writing the other party to the Contract and provide to the other party a copy of the Notice of Dispute.

.3 The Owner and the Contractor shall, within six (6) calendar days of receiving such notification, review the dispute jointly and attempt a resolution by negotiation.

.4 If the Owner and the Contractor are not able to resolve the dispute by negotiation, they may, by mutual agreement, engage a mediator to assist them in further negotiation towards reaching a resolution.

.5 Alternatively, or after mediation has failed, the Owner and the Contractor may, by mutual agreement, submit the dispute to arbitration under the laws of the jurisdiction in which The Work is situated. Insofar as it is compatible with the law in the jurisdiction in which The Work is situated, the Recommended Procedures for Arbitration of Construction Disputes of the Canadian Construction Association, the most current edition, shall be followed. The arbitrator's decision shall be binding.

.6 Alternatively, the Contractor or the Owner may commence an action at law with respect to the dispute if it cannot be resolved by negotiation either with or without mediation.

.7 Neither negotiation with or without mediation, nor arbitration, shall be conditions precedent to proceeding with an action at law.

.8 If the dispute is not resolved promptly, the Engineer shall give instructions in writing to the Contractor to do such work or to take such actions or refrain from taking such actions as may be required to avoid delay, mitigate damage and continue the proper performance of The Work pending resolution of the dispute. The Contractor shall act promptly in accordance with such instructions and by so doing shall not jeopardize any claim he may have with respect to the dispute.

11. DELAYS

.1 If the Contractor is delayed in the performance of The Work by weather, labour disputes, strikes or lock-outs of the Contractor's forces, or delay by common carriers, the Contractor shall not be compensated for any additional costs thereby

incurred, nor shall the completion dates be changed, because it is agreed that the Contractor is more competent than the Owner to assess the probability and impact of these events. The Contractor's forces in this context includes Subcontractors and Suppliers and Manufacturers supplying or providing Products or Materials.

.2 If the Contractor is delayed in the performance of The Work by failure of the Owner to make decisions respecting The Work, late delivery of Materials or Products furnished by the Owner, or acts or omissions of the Owner, or by strikes or lock-outs of the Owner's forces, the Contractor shall be compensated for any additional costs thereby incurred, and the completion date, subject to paragraph 11.5 shall be changed. The amount of the compensation and the extent of change in completion date shall be determined in the first instance by the Engineer.

.3 If the Contractor is delayed in performance of The Work by a Suspension of The Work Notice by the Owner and if the period of suspension is thirty (30) calendar days or less, the Contract time shall be extended by the period of suspension plus six (6) calendar days, subject to the condition of paragraph 11.5.

.4 If the Contractor is delayed in the performance of The Work by a Stop Work Order issued by a court or other public authority following the execution of this Contract, and provided that such Order was not issued as a result of any act or fault of the Contractor, or of anyone employed by him directly or indirectly, then the Contractor shall be entitled to claim compensation for additional costs thereby incurred, and the completion date, subject to paragraph 11.5, shall be changed. The amount of compensation and the extent of change in completion date shall be determined in the first instance by the Engineer.

.5 If the Completion Date is changed in accordance with paragraphs 11.2, 11.3 or 11.4, then, with respect to the new Completion Date, time is of the essence.

.6 The Contractor shall provide to the Owner timely written notice of all delays for which it is the Contractor's intention to claim either an extension of completion time or costs resulting from the delay or both.

.7 Impact Delays are those delays that arise out of the Owner’s requirement of the Contractor to perform changes in The Work.

(a) Impact delays may be a) certain to occur, b) foreseeable, but not certain to occur, or c) not foreseeable. At the time of submitting a Quotation for Contemplated Change, the Contractor shall identify his intention, if any, to claim for Impact Delays, and provide justification for such claims or intentions to claim so that these can be negotiated and agreed upon in the Change Order.

(b) No claim for Impact Delays shall be valid or enforceable except as provided for in a Change Order.

12. OWNER'S RIGHT TO DO WORK

.1 If the Contractor should refuse or fail to supply adequate Product, Material, Plant or workmanship for the scheduled performance of The Work, or neglect to prosecute The Work properly, or fail to perform any of the provisions of the Contract, then the Owner may give written notice to the Contractor and his Surety that the Contractor is in default of his contractual obligations, and instruct him to correct the default within five (5) working days.

.2 If the correction of the default cannot be completed within the five (5) working days specified, the Contractor shall be considered to be in compliance with the Owner'S instruction if he:

(a) Commences the correction of the default within the specified time; and

(b) Provides the Owner with an acceptable schedule for such correction; and

(c) Completes the correction in accordance with such schedule.

.3 If the Contractor fails to comply with the provisions of General Conditions 12.1 and 12.2, the Owner may, without prejudice to any other right or remedy he may have, correct such default and may deduct the cost thereof from the payment then or thereafter due the Contractor. The Engineer shall, in the first instance, determine that both the corrective action and the amount subsequently charged to the Contractor are reasonable.

13. OWNER'S RIGHT TO TERMINATE THE CONTRACT

.1 If the Contractor should:

(a) Be adjudged bankrupt, or make a general assignment for the benefit of creditors, or if a receiver is appointed on account of his insolvency; or

(b) Fail to make sufficient payments due to his creditors for labour, Plant, Product and Material used or reasonably required for use on or in The Work; or

(c) Disregard laws or ordinances, or the Engineer's instructions; or

(d) Abandon The Work, or fail to adhere to The Work Schedule to such an extent that there is danger of failing to meet Completion dates; or

(e) Otherwise violate the fundamental conditions of the Contract;

the Owner shall, by written notice, instruct the Contractor to correct the default within five (5) working days. If the default is not corrected within five (5) working days, then the Owner may, without prejudice to any other right or remedy he may

have, terminate the Contractor's right to continue The Work or terminate the Contract.

.2 If the Owner terminates the Contractor's right to continue with The Work or terminates the Contract under the conditions set out above, and if the performance Warranty is unconditional, the Owner shall be entitled to:

(a) Take possession of the premises, Product, Material and Plant and utilize them to finish The Work by whatever method he may deem expedient but without undue delay or expense;

(b) Withhold any further payments to the Contractor until The Work is finished;

(c) Upon completion of The Work, determine the full cost of finishing The Work as certified by the Engineer, including compensation to the Engineer for his additional services and a reasonable allowance as determined by the Engineer to cover the cost of any corrections required under the Warranty Period, and charge the Contractor the amount by which the full cost exceeds the unpaid balance of the Contract Price; or if such cost of finishing The Work is less than the unpaid balance of the Contract Price, pay the Contractor the difference; and

(d) On expiry of the Warranty Period, charge the Contractor the cost of corrections required under the warranty.

The Contractor's obligation under the Contract as to the quality of that portion of The Work and warranty of that portion of The Work performed by the Contractor prior to termination of the Contractor's right to continue with The Work shall continue in force after the termination.

.3 If the Contractor has provided a Performance Bond, the Owner shall have the option of:

(a) Terminating the Contractor's right to continue with The Work; or

(b) Terminating the Contract; or

(c) Exercising the Owner's rights in accordance with conditions of the Performance Bond.

14. SUSPENSION OF THE WORK BY THE OWNER

.1 The Owner may suspend the execution of The Work by giving written notice to the Contractor to that effect.

.2 The Contractor, upon receiving such written notice, shall immediately suspend all operations except those necessary for the care and preservation of the portions of The Work already executed, and the Worksite.

.3 During the period of suspension, the Contractor shall not remove from the Worksite any part of The Work or any Material, Product or Plant without the written approval of the Owner.

.4 If the period of suspension is thirty (30) calendar days or less, the Contractor shall, upon expiry of the suspension, resume the execution of The Work and he shall be paid additionally all of his reasonable costs incurred because of the suspension. The additional costs shall be claimed by the Contractor and shall be verified by a determination of the Engineer in the first instance.

.5 After thirty (30) calendar days, of suspension of The Work the Owner at its sole option shall:

(a) Negotiate terms under which the Contractor shall continue with the execution of The Work and the Contractor shall then resume operations in accordance with the terms of that negotiation; or

(b) Deem the Notice of Suspension to be a Notice of Termination of the Contract. In the event of Termination, the Contractor shall be paid his reasonable costs incurred due to the suspension. The additional costs shall be claimed by the Contractor and verified in the first instance by a determination of the Engineer. The Contractor shall not have a claim for loss of profit on that portion of The Work not performed.

.6 After thirty (30) calendar days of suspension of The Work, the Contractor shall be allowed to remove any or all of its Plants from the Worksite without further approval from the Owner.

15. CONTRACTOR'S RIGHT TO STOP WORK OR TERMINATE THE CONTRACT

.1 If the Owner should be adjudged bankrupt, or makes a general assignment for the benefit of creditors, or if a receiver is appointed on account of his insolvency, the Contractor may, without prejudice to any other right or remedy he may have, by giving the Owner five (5) days written notice, terminate the Contract.

.2 If The Work should be stopped or otherwise delayed for a period of thirty days or more under an order of any court or other public authority, and provided that such order was not issued as the result of any act or fault of the Contractor or of anyone directly or indirectly employed by him, the Contractor may, without prejudice to any other right or remedy he may have, by giving the Owner written notice, terminate the Contract.

.3 The Contractor may notify the Owner in writing, with a copy to the Engineer, that the Owner is in default of his contractual obligations if:

(a) The Engineer fails to certify a Progress Payment Certificate in accordance with these General Conditions; or,

(b) The Owner, subject to requirements of these General Conditions, fails to pay to the Contractor when due, any amount certified by the Engineer, or awarded by arbitrators; or,

(c) The Owner fails to furnish, upon written request from the Contractor, reasonable evidence of ability to fulfill the Owner's financial obligation under the Contract.

Such written notice shall advise the Owner that if such default is not corrected within fifteen (15) calendar days from the receipt of the written notice the Contractor may, without prejudice to any other right or remedy he may have, stop The Work and terminate the Contract.

.4 If the Contractor terminates the Contract under the conditions set out above, he shall be paid for all work performed and for any loss sustained upon Material, Product And Plant, with reasonable profit.

16. CHANGES IN THE WORK

.1 The Owner may order changes in the work through additions, deletions, modifications or variations without invalidating the Contract. The value of such changes shall be taken into account in ascertaining the final amount of the Contract Price. All such work shall be executed under the conditions of the Contract. No extension of the Contract Completion Time shall be made on account of changes in the work unless expressly provided for in the Change Order.

.2 No changes in the work shall be made unless pursuant to a Field Order or a Change Order and no payment shall be made or credit given unless authorized by a Change Order.

.3 The authority of the Engineer to order payment without prior approval of the Owner, through a Change Order is limited in any one instance to 10% of the Contingency Allowance or Five Thousand Dollars ($5,000) whichever is the lesser, and cumulatively to the amount of the Contingency Allowance. The Contractor shall not depend upon the order of the Engineer for claiming payments for changes in the work carried out in excess of those limits, without prior approval of the Owner in each instance.

.4 The Contractor may, in writing, propose changes in the work, including the amount of additional payment or credit entailed in the proposal. If the Owner accepts the Contractor's proposal, the Owner and the Contractor will authorize a Change Order to that effect.

.5 When the Owner desires to make a change in the work it shall issue a Notice of Contemplated Change (NCC) to the Contractor and the Contractor shall return to the Owner a Quotation for Contemplated Change (QCC). If the Quotation for

Contemplated Change is accepted the change in the work shall be authorized by a Change Order signed by the Owner and the Contractor.

.6 If the Contractor claims that any instruction by drawings, or otherwise, involves a change in The Work under this Contract, he shall give the Owner written notice thereof immediately, and he shall then follow the Owner's instruction regarding doing the work in question. No such claim shall be valid unless so made. If the Contractor's claim for a change in The Work is approved a Change Order shall be issued. The Engineer shall, in the first instance, determine the validity of the Contractor's claim.

.7 Any work outside the scope of the Contract for which the Contractor might be entitled to compensation, including any claim on the basis of quantum merit, shall be considered a change in The Work. No claim by the Contractor for additional payment on the basis of a change in The Work shall be valid and enforceable against the Owner unless it is made pursuant to the provisions of General Condition 16.1 to 16.6.

17. VALUATION OF CHANGES IN THE WORK

.1 The valuation of changes in The Work due to differences between actual measured quantities at the time of construction and the approximate estimated quantities shown in the Tender shall be determined on the basis of the Unit Prices named in the Tender. No Change Order is required.

.2 The valuation of changes in The Work due to deletion of work within the scope of the Contract or addition of work to the scope of the Contract shall be determined by Unit Prices named in the Tender. A Change Order is required.

.3 When there are changes in The Work which are not covered by Unit Prices named in the Tender, the valuation of such changes shall be determined by:

(a) An agreement on a Lump Sum in each instance between the Owner and the Contractor; or

(b) At the rates for the provision of labour and Plant named in the Schedule of Force Account Rates in the Supplementary Tender Forms, plus the Contractor's cost plus 10% for Material and Product F.O.B. the job site, as established by invoices; or

(c) On a Contractor's cost basis as follows:

i) Payroll Cost of Labour, defined as direct wages and salaries for the hours worked, plus 10% to cover Workers' Compensation, Unemployment Insurance, Holiday Pay, Paid Statutory Holidays and other valid payroll burdens;

ii) The Contractor's cost of providing room and board for labour, if room and board is normally provided by the Contractor on The Work;

iii) The Contractor's cost for Material and Product F.O.B. the job site, less trade discounts, as established by invoices;

iv) Ten percent (10%) fee on the sum of items i), ii) and iii) to cover office and general overhead, use of small tools and profit. Overhead includes the cost of superintendence, foremen, timekeepers and other administrative and supervisory personnel and their vehicles and other job site costs, plus all office overhead costs;

v) The cost of rental of Plant for the hours worked, at locally-accepted rates, or at provincial or territorial rates, for complete units including operator, fuel, grease, maintenance and all such other costs as are normal to an operating unit on the job site;

vi) A 10% markup on item v) to the Contractor (but not to a Subcontractor) provided that the Contractor does not own the equipment; and

vii) Valid transportation costs for PLANT, specifically required for the change in the work, with no markup.

The choice of valuation methods a), b) or c) shall be made by the Owner in his sole discretion.

.4 When the change in The Work is being done on a cost basis, that is, options b) or c), the Contractor shall be paid for work performed by his Subcontractors on the basis of a valuation in accordance with b) or c), depending upon which was selected by the Owner for the change in The Work. The Contractor shall be allowed a markup of 10% on the Subcontractor's charges to cover the Contractor's coordination.

.5 When a change in The Work is being done on a cost basis, either option b) or c), the Contractor shall submit to the Engineer or the Owner on a daily basis an accounting in triplicate for work done on the preceding calendar day. The accounting shall include a listing of the hours of labour and PLANT and a listing of the Material and Product used. The Engineer shall, each day, check the Contractor’s accounting and, if it is numerically correct, he shall sign the three copies and return one signed copy to the Contractor. Only those items which are eligible in accordance with the Contract shall be certified for payment by a Change Order. The Engineer's signature shall not constitute an approval for payment.

.6 If, on any day, the Contractor fails to submit an account of the change in The Work being done on a cost basis, either option b) or c), the Engineer shall prepare the accounting, and this accounting shall be used as the basis of payment for that portion of the change in The Work, and no payment will be made for any other

amount subsequently claimed by the Contractor for that portion of the change in The Work.

18. PAYMENTS

.1 At the end of each month during the performance of The Work, the Contractor shall prepare a Progress Payment Claim for that portion of The Work done during that month.

A holdback of 10% of the total value of that portion of The Work performed to the end of that month, as shown on the Progress Payment Claim, shall be retained for various purposes of the Owner, including conformance with the lien enactment, along with any other deductions from the Progress Payment Claim which may be warranted or may be required in accordance with conditions of this Contract.

Where the Engineer is responsible for the measurement and calculation of tender items, the Progress Payment Claim will be prepared by the Engineer.

.2 The Progress Payment Claim shall be certified by the Engineer on the Progress Payment Certificate. Provided that the Contractor has submitted his Progress Payment Claim by the end of the month, the Progress Payment Certificate shall be submitted to the Owner within seven (7) calendar days after the end of the month during which that portion of The Work covered by the Progress Payment Certificate was performed.

.3 Within 28 calendar days after receipt of the Progress Payment Certificate the Owner shall make payment to the Contractor in the amount certified on the Progress Payment Certificate, provided there are no valid reasons for withholding payment.

.4 The Owner may withhold payment on any Progress Payment Certificate as may be necessary or prudent to protect himself from loss on account of:

(a) Unsatisfactory progress by the Contractor;

(b) Defective work which is not remedied;

(c) Claims filed, or reasonable expectation that claims will be filed, against the Owner or the Contractor;

(d) The failure of the Contractor to make payments properly to Subcontractors or for Material, Product, Plant and labour, or otherwise;

(e) Damages caused by the Contractor to an Other Contractor;

(f) Any other evidence of loss or danger of loss by the Owner, on account of the Contractor's operations.

When the grounds are removed, payment shall be made of accounts withheld because of them.

.5 In the event that The Work has been substantially completed, but minor items remain uncompleted and deficiencies have not all been rectified, the Owner may withhold payment on Progress Payment Certificates in amounts sufficient, in the estimation of the Engineer, to ensure that the Contractor will complete such items and rectify such deficiencies in a timely manner. When the deficiencies have been rectified, the deficiency holdback applied shall be released.

.6 The Contractor may claim the Holdback, either in total, or in increments, in accordance with applicable Lien Act.

.7 The Owner shall pay the Contractor's claim for Holdback release after the following conditions have been satisfied:

(a) The Contractor, or the Owner, or the Engineer on behalf of the Owner, has issued a Certificate of Completion, or a Certificate of Substantial Completion, in accordance with requirements of the Lien Act.

(b) The Contractor has submitted to the Owner, a Certification from the Worker's Compensation Board stating that all assessments due to them from the Contractor are currently paid up.

(c) The Contractor has filed with the Owner, a Statutory Declaration that, with the exception of Holdbacks retained by the Owner, all payments have been made to eligible Lien claimants and that there are no liens existing against the premises of The Work.

.8 Final Payment and holdback release do not constitute a waiver of the Warranty Period, nor shall they or attendant acts of the Engineer or the Owner prejudice their rights under any requirement of the Contract, nor relieve the Contractor of any of his responsibilities thereunder.

19. CONSTRUCTION COMPLETION CERTIFICATE

.1 Upon receipt of Written Notice from the Contractor that The Work is complete, that all deficiencies have been rectified, and all cleanup finished, the Engineer shall make an inspection, and when he finds The Work complete under the Contract, he shall issue the Construction Completion Certificate over his signature and the date specified in this Certificate shall be the date of commencement of the Warranty Period.

.2 If, upon inspection, the Engineer determines that The Work is not completed, he shall instruct the Contractor, and issue a list of work items to be done, of cleanup items remaining, and of deficiencies to be rectified and when these have been done, he shall issue to the Contractor, the Construction Completion Certificate, and the date specified in this Certificate, shall be the date of commencement of the

Warranty Period. The issuance of the Construction Completion Certificate does not release the Contractor from his responsibilities under the Contract.

20. FINAL CERTIFICATE

.1 Upon the expiration of the Warranty Period, the successful conclusion of any tests required by the Contract and satisfactory performance under operating conditions meeting The Work Performance Warranty, the Owner shall accept The Work and a Final Certificate may be issued if required by the Contractor. It shall be the responsibility of the Contractor to apply in writing to the Engineer for a Final Certificate.

.2 The issuance of a Final Certificate shall not release the Contractor from responsibility for any defects in his work, Product or Material for which the Contractor may in future be found liable in a court of law or otherwise.

21. TAXES AND DUTIES

.1 The Contractor shall pay all government sales taxes, customs duties and excise taxes and comply with laws, Acts, and regulations for collection and remittance of taxes with respect to the Contract.

.2 The Contractor shall pay all GST.

For those items of Product and Material for which the Owner has an exemption from Federal Sales Tax, the Owner will provide an Exemption Number and Certification that the Product and Material was used in a manner consistent with the requirements for Federal Sales Tax Exemption.

The Contractor may then recover the GST paid on exempt Product and Material under this Contract.

.3 The Goods and Services Tax (GST) is NOT to be considered a tax payable by the Contractor and is NOT included in the Tender Price or the Contract Price.

The Contractor shall show separately on each Progress Payment Claim the applicable amount of Goods and Services Tax as required by the Act for the Total Amount of the Progress Payment including the Holdback. The GST on the Net Amount of Payment less Holdback will be paid to the Contractor by the Owner in addition to the Payment certified on the Progress Payment Certificate and the payment of the Goods and Services Tax will not affect the Holdback or the Contract Price.

GST on the Holdback will be paid to the Contractor upon release of Holdback in addition to payment of the Holdback.

The Contractor will remit the Goods and Services Tax in accordance with procedure established by the GST Act

22. PATENT FEES

.1 The Contractor shall pay all royalties and patent license fees required for the performance of the Contract. He shall hold the Owner harmless from and against all claims, demands, losses, costs, damages, actions, suits or proceedings arising out of the Contractor's performance of the Contract which are attributable to an infringement or an alleged infringement of any patent of invention, by the Contractor, or anyone for whose acts it may be liable.

.2 In the event that the Contractor claims that, during the performance of The Work, he has encountered a claim for a patent license fee, for use of a Material, Product, process or method which was specified by the Engineer, and that he was not previously aware that use of such Material, Product, process or method was restricted under patent, or that a patent license fee was required, he shall immediately notify the Owner, in writing, setting out the details of such claim and evidence of his previous lack of awareness of such license fee being required. The Engineer shall immediately investigate the claim and if it is judged valid, and the Material, Product, process or method is used, the Owner shall pay the patent license fee.

23. LAWS, REGULATIONS, SURVEYS AND PERMITS

.1 The Laws and Regulations of the place where The Work is performed shall govern.

.2 The Owner shall provide all legal surveys except legal surveys required to replace survey pins destroyed or damaged by the Contractor.

.3 The Contractor shall obtain all Permits, Licenses and Certificates, and pay all fees required for the performance of The Work.

.4 The Owner shall obtain all easements and rights-of-way, and the Contractor shall have free use thereof for the purposes of this Contract, provided that such use shall not interfere with or impede the operation of any Other Contractors or workmen employed by the Owner, nor be in conflict with conditions of easement agreement or right-of-way limits. The Contractor shall indemnify and defend the Owner against any claims, demands, or losses due to failure to meet all conditions of an easement agreement.

.5 The Contractor shall give all required notices, and comply with all laws, ordinances, regulations, codes and orders of all authorities having jurisdiction relating to The Work, to preservation of public health, and to construction safety. If the Contractor observes anything in the Contract Documents to be at variance with the foregoing, he shall promptly notify the Engineer in writing, and shall await the Engineer's instructions. If the Contractor performs any work, knowing it to be contrary to such laws, ordinances, regulations, codes or orders, and without giving notice to and requesting instructions from the Engineer, he shall bear all costs arising therefrom.

.6 The Contractor shall make all arrangements with local authorities, operating departments, railway and highway officials, utility and service companies and the like, for detours, crossings, traffic control and similar requirements relating to performance of The Work, and he shall at his own cost observe their requirements and regulations.

24. COMPLIANCE WITH OCCUPATIONAL HEALTH AND SAFETY ENACTMENTS

.1 The Contractor shall be primarily responsible for ensuring compliance with the applicable Occupational Health and Safety enactment and Regulations thereunder on the Worksite.

.2 In any case where, pursuant to the provisions of the applicable Occupational Health and Safety Act or its Regulations, an order is given to the Contractor or to one of his Subcontractors with respect to their operations under this Contract to cease operations for any reason (for examples, because of failure to install or adopt safety devices or appliances or methods as directed or required by the Act or Regulations thereunder, or because conditions of immediate danger exist that would be likely to result in injury to any person), the Contractor shall immediately obey such order and shall immediately take whatever steps are necessary to eliminate the cause of the order.

.3 In the event that the Engineer discovers a dangerous condition which in the Engineer’s opinion is likely to result in injury to any person, and there is no one in authority from the Contractor available or capable of removing the danger resultant from the Contractor's operations, and no Officer of the Crown is available to take charge, then the Engineer may:

(a) issue a Field Order to the Contractor’s workers to vacate the area of danger;

(b) issue a Field Order to the Contractor requiring the immediate correction of the dangerous condition; and

(c) notify the appropriate Officer(s) under the applicable Occupational Health and Safety Act,

and no such action by the Engineer shall in any way remove the responsibility for the matter from the Contractor, and the Contractor shall bear all related costs without recourse.

.4 In the event that the Engineer discovers a dangerous condition which in the Engineer’s opinion is likely to result in damage to any property, and there is no one in authority from the Contractor available or capable of removing the danger resultant from the Contractor'S operations, and no Officer of the Crown is available to take charge, then the Engineer may issue Written Notice to the Contractor and may immediately arrange for the removal of this danger and the Contractor shall be liable for the costs of such arrangements, but such act by the Engineer shall not

relieve the Contractor of responsibility for injury, loss of life, or damage which may occur in that situation. The Engineer may also invoke Section 27.5 of this Specification.

.5 In the event that the Contractor refuses or fails to comply with an order under the Act or Regulations thereunder, so that the performance of The Work is stopped, the Owner may, upon written notice, terminate the Contract and proceed in accordance with General Conditions 13.2.

.6 No action or lack of action by the Engineer or the Owner under any of the provisions of this Section shall relieve the Contractor of his responsibilities under 24.1 above.

.7 The successful Tenderer shall be the Principal or Prime Contractor / Constructor for the Project pursuant to the applicable construction safety legislation and shall have primary responsibility for the safety of all workers and equipment on the Project in accordance with such legislation.

.8 The Contractor shall provide the Engineer with a copy of the Contractor's Certificate of Recognition (COR) which is relevant to their industry and which is recognized by Alberta Employment, Immigration and Industry, and Workplace Health and Safety.

.9 The Contractor shall provide the Engineer with a copy of Contractor's Corporate Safety Policy and Safety Procedures manual applicable to the work on this contract. The Contractor shall ensure that all his employees and subcontractors are aware of these policies and procedures and that safe working conditions are maintained on the site.

25. LIABILITY INSURANCE

.1 Comprehensive General Liability Insurance:

(a) The Contractor shall provide and maintain, either by way of a separate policy or by an endorsement to its existing policy, Comprehensive General Liability Insurance in a form and with an insurer acceptable to the Owner and subject to limits of not less than five million dollars ($5,000,000) inclusive per occurrence for bodily injury, death, and damage to property including loss of use thereof.

(b) The insurance shall be in the joint names of the Contractor, the Owner and the Engineer, and shall also cover as Unnamed Insureds all Subcontractors and anyone employed directly or indirectly by the Contractor or his Subcontractors to perform a part or parts of THE WORK and including suppliers while on the Worksite to deliver Material or Product.

The insurance shall also include as Named Insured the Town of Whitecourt and Stantec Consulting Ltd.

(c) The insurance shall also include as Unnamed Insureds the consultants of the Owner and of the Engineer, on The Work.

(d) The Comprehensive General Liability Insurance shall include coverage for:

i) premises and operations liability

ii) products or completed operations liability

iii) blanket contractual liability

iv) cross liability

v) elevator and hoist liability, as applicable

vi) contingent employer's liability

vii) personal injury liability arising of false arrest, detention or imprisonment or malicious prosecution, libel, slander or defamation of character; invasion of privacy, wrongful eviction or wrongful entry.

viii) shoring, blasting, excavating, underpinning, demolition, pile driving and caisson work, work below ground surface, tunnelling and grading, as applicable.

ix) liability with respect to non-owned licensed vehicles.

(e) Comprehensive General Liability Insurance shall remain in effect continuously until the Construction Completion Certificate has been issued and then a Completed Operation Extension for 24 months shall be provided by the Contractor.

.2 Automobile Liability Insurance:

(a) The Contractor shall provide and maintain liability insurance in respect of owned, non-owned and leased or rented licensed vehicles, aircraft or water craft, subject to limits of not less than three million dollars ($3,000,000) inclusive.

(b) Automobile liability insurance shall be maintained continuously until the end of the Warranty Period.

.3 The Contractor shall provide the Owner with three certified copies of the Certificate of Insurance prior to the commencement of The Work and shall promptly provide the Owner with a certified true copy of each insurance policy if requested.

.4 All liability insurance policies shall contain an endorsement to provide all Named Insureds with prior notice of material changes and cancellations. Such endorsement shall be in the following form:

"It is understood and agreed that the coverage provided by this policy will not be changed or amended materially nor cancelled until 30 days after written notice of such change or cancellation shall have been given to all Named Insureds."

26. PROTECTION OF WORK AND PROPERTY

.1 The Contractor shall continuously maintain adequate protection of all of The Work from damage and protect the Owner's property from damage or loss arising in connection with this Contract. He shall make good any such damage or loss.

.2 The Contractor shall provide and maintain all passageways, guard fences, lights and other facilities for protection required by public authority or local conditions, or laws and regulations.

.3 The Contractor shall also protect all of the property outside of The Work from damage as a result of his operations. Any such damage shall be corrected by the Contractor at his expense.

.4 In an emergency affecting the safety of life, or of The Work, or adjoining property, the Contractor, without special instruction or authorization from the Engineer, shall act at his discretion to prevent such threatened loss or injury. Liability for payment for such action and the amount thereof shall be determined in the first instance by the Engineer.

.5 If the Engineer becomes aware of an emergency affecting the safety of life, or of The Work, or of adjoining property, and the Contractor, having been advised in writing of the emergency, fails or refuses to act to prevent such threatened loss, injury or damage, or if the Engineer is unable to advise the Contractor, the Engineer may order labour, material, and Plant to be applied to prevent loss, injury or damage. The cost of labour, materials and equipment so used shall be the responsibility of the Contractor, and such action by the Engineer shall not relieve the Contractor of any responsibility for loss, injury, or damage which does occur.

27. WARRANTY PERIOD

.1 The Warranty Period shall begin on the date specified in the Construction Completion Certificate.

.2 The duration of the Warranty Period shall be two (2) years.

.3 The Contractor shall correct, at his own expense, any defects in The Work due to faulty products or workmanship appearing within the Warranty Period.

.4 The Contractor shall correct or pay for any damage to The Work or other property resulting from such defects or their correction.

.5 The Owner shall notify the Contractor promptly of such defects. If the Contractor does not cause repairs to be made within ten (10) days after such notice, the Owner shall have the right to purchase Material and employ men to execute said repairs, and the cost of the same shall be the responsibility of the Contractor or his Surety.

.6 Where repairs must be made immediately by reason of an emergency existing or otherwise, the Owner shall have the right to undertake such repairs and charge the cost to the Contractor, except that the Owner shall immediately notify the Contractor and shall withdraw from the work of repair if and as soon as the Contractor's forces are ready to start work.

.7 The Contractor shall be responsible for all costs attributable to defective work, Product or Material, including the cost of engineering required for investigation of any repair of defects in The Work.

.8 At least one month prior to expiry of the Warranty Period, the Owner shall notify the Contractor in writing of any final tests which the Contractor may be required to carry out under the Contract. The Contractor shall arrange to have such tests carried out promptly, and to provide opportunity for the Owner to inspect or supervise such tests.

.9 At least one month prior to expiry of the Warranty Period, the Owner shall advise the Contractor of defects which the Contractor is required to remedy under the Contract, and the Contractor shall promptly remedy such defects. The Warranty Period shall not expire until all such defects are remedied.

28. INSPECTION OF THE WORK

.1 The Engineer and his representatives shall at all times have access to The Work whenever it is in preparation or progress and the Contractor shall provide proper facilities for such access and for inspection. The Engineer shall have authority to reject work which does not conform to the requirements of the Contract.

.2 If the specifications, the Engineer's instructions, laws, ordinances, or any public authority require any part of The Work to be specially tested or approved, the Contractor shall give the Engineer timely notice of his readiness for inspection, and if the inspection is by an authority other than the Engineer, of the date fixed for such inspection.

.3 Inspections by the Engineer shall be made promptly. If any part of The Work should be covered up without approval or consent of the Engineer, it must, if required by the Engineer, be uncovered for examination at the Contractor's expense.

.4 Re-examination of questioned parts of The Work may be ordered by the Engineer and if so ordered those parts of The Work shall be uncovered by the Contractor. If

such parts of The Work are found not in accordance with the Contract Documents through the fault of the Contractor, the Contractor shall pay the cost of examination and replacement of The Work. If such parts of The Work are found in accordance with the Contract Documents, the Owner shall pay these costs.

.5 Material and Product to be used in The Work are subject to inspection and approval of the Engineer at his discretion. Material and Product condemned as being unsuitable and not in conformity with the specifications, shall be removed from The Work and its vicinity without delay, and if the Contractor fails to do so within forty-eight (48) hours after having been so directed by the Engineer, the rejected Material and Product may be destroyed or removed by the Owner and the cost shall be charged to the Contractor.

.6 The Engineer shall inspect The Work in the Owner's interest for the purpose of promoting effective completion of The Work until the Construction Completion Certificate is issued, and such inspection or lack of it shall not relieve the Contractor of his responsibility to perform The Work in accordance with the Contract.

29. REJECTED WORK

.1 Defective Work which has been rejected by the Engineer as failing to conform to the intent of design as expressed in the Contract Documents whether the result of poor workmanship, use of defective Material or Product, or damage through carelessness or other act or omission of the Contractor, and whether incorporated in The Work or not, shall be removed promptly from the premises by the Contractor and replaced or re-executed promptly at the Contractor's expense.

Work that has not been rejected specifically by the Engineer shall not therefore be deemed accepted or approved by the Engineer.

.2 Other Contractors' work destroyed or damaged by such removals or replacements shall be made good promptly at the Contractor's expense.

.3 If in the opinion of the Engineer it is not expedient to correct defective Work or Work not done in accordance with the intent of design as expressed in the Contract Documents, the Owner may deduct from the Contract Price the difference in value between The Work as done and that called for by the Contract. The difference shall be determined in the first instance by the Engineer.

30. LABOUR

.1 The Contractor shall employ Canadian Labour to the fullest practical extent and shall ensure that no person will be discriminated against because of race, colour, gender, age, religion, or origin.

.2 Wages and hours of labour shall be in compliance with Federal, Provincial or Territorial enactment, whichever governs.

.3 The Contractor shall at all times enforce discipline and good order among his employees, and shall not employ on The Work any unfit person or anyone not skilled to do The Work assigned to him. Any person employed on The Work who becomes intoxicated, intemperate, disorderly, incompetent or willfully negligent, shall be removed from The Work.

31. MATERIAL AND PRODUCT SUPPLIED BY THE CONTRACTOR

.1 The Contractor shall use Material and Product of Canadian manufacture to the fullest extent practicable.

.2 Unless otherwise specified, all Material and Product shall be new and of good quality. The Contractor shall furnish satisfactory evidence as to the kind and quality of Material and Product. The Contractor shall be responsible for replacement at his own cost of all Material and Product that are found to be defective in manufacture or that have become damaged in handling.

.3 The Contractor shall be responsible for the safe storage of Material and Product furnished by or to him, and accepted by him, and intended for The Work, until it has been incorporated into The Work.

.4 Where, in the specifications or on the drawings, any Material, Product or method is specified, the Contractor may not use another Material, Product, equipment or method unless the Engineer has issued to the Contractor a written authorization for the use. The Contractor shall submit in writing an application for review to the Engineer. All submissions shall be accompanied by sufficient data including the following:

(a) Delivery

(b) Manufacture

(c) Technical Data and Specifications in accordance with the International System of Units (S.I.) - metric units

(d) Specified Material, Product or method for which the alternative is submitted

(e) Prices in relation to the Material; method or Product specified originally.

Where required by the Engineer, samples shall be submitted.

.5 Whenever alternatives of Material, Product or methods are accepted for The Work, whether as a result of an alternative Proposal by the Contractor or an equivalent alternative submitted by the Contractor, the Contractor shall guarantee that the performance of the alternative Material, Product, or method shall be equivalent to what was originally specified.

.6 Whenever alternatives of Material, Product or methods are accepted for use on The Work, whether as a result of an alternative proposal by the Contractor or an equivalent alternative submitted by the Contractor, the Contractor shall be responsible for making all consequent adjustments, at his own expense, to make the alternative fit into The Work as specified.

32. MATERIAL AND PRODUCT SUPPLIED BY THE OWNER

.1 The Owner undertakes to supply only such Material or Product as are specifically shown in the Contract Documents as being provided by the Owner.

.2 It shall be the responsibility of the Contractor to arrange for and schedule delivery and storage of Material and Product supplied by the Owner.

.3 The Contractor's responsibility for Material and Product furnished by the Owner shall begin at the time and place of delivery thereof to the Contractor. Material and Product already on the site shall become the Contractor's responsibility on the date specified in the Notice to Proceed. The Contractor shall be responsible for unloading all Owner-supplied Material and Product and the Contractor and the Engineer shall jointly examine them at the time and place of delivery to the Contractor, and shall prepare a statement of acceptance, specifically noting any defects and rejecting any defective Material or Product. The Contractor shall sign a Statement of Acceptance of Material and Product when accepting them into his charge. Any Material and Product furnished by the Owner and installed by the Contractor shall, if found defective, be replaced by the Contractor. The Contractor, shall, at his own expense, furnish supplies, labour and facilities necessary to remove the defective Material and Product and install the sound Material and Product in a satisfactory manner.

33. STORAGE FACILITIES AND USE OF PREMISES

.1 The Contractor may use such facilities and areas as the Owner may be willing and able to designate for the storage of Material and Product for The Work, without charge to the Contractor.

.2 Should the Contractor require additional facilities or areas he shall make all the necessary arrangements with the owners or occupants of such other facilities or areas and shall pay all rentals and all damages caused by such occupancy.

.3 The Contractor shall confine his apparatus, the storage of Material and Product and the operations of his workmen to limits indicated by law, ordinances, permits or directions of the Engineer and shall not unreasonably encumber the premises with his Material, Product or Plant.

.4 The Contractor shall enforce all regulations and rules for the Worksite regarding signs, advertisements, fires, smoking, and storage of inflammable Material or Product, and disposal of wastes.

.5 The Contractor shall not load or permit any part of The Work or of the Owner's structures to be loaded in any way that will endanger their safety.

34. USE OF COMPLETED PORTIONS OF THE WORK

.1 The Owner shall have the right to take possession of and use any completed or partially completed portions of The Work, notwithstanding that the time for completing The Work or such portions of The Work may not have expired; but such taking possession of and use shall not be deemed an acceptance of The Work.

.2 If such prior use increases the cost of The Work, the Contractor shall be entitled to such compensation as the Engineer in the first instance may determine.

.3 If a planned taking possession of and use of portions of The Work has been stipulated in the Contract Documents, then the Contractor shall have no claim for extra compensation on that account.

35. CLEANUP AND FINAL CLEANING OF THE WORK

.1 The Contractor shall maintain The Work in a tidy condition, free from accumulation of waste products and debris caused by his own operations.

.2 When The Work is fully completed, the Contractor shall remove all surplus Material and Product, tools and Plant. He shall also remove any waste products and debris, other than those caused by the Owner, Other Contractors or their employees. He shall generally leave the Worksite in a neat and orderly condition.

36. REMEDIES

.1 The specific remedies to which the Contractor and the Owner may resort under the terms of the Contract Documents are cumulative and are not intended to be exclusive of any other remedies to which the Contractor and the Owner may be lawfully entitled in a case of breach or threatened breach of any covenant, term or provision of the Contract.

.2 The waiver by the Owner or Engineer of any breach of any covenant or warrant in the Contract shall not be construed as a waiver of any future breach of the same terms of the Contract, and the approval by the Owner or Engineer of any act by the Contractor or Subcontractor shall not be construed as an approval to any subsequent similar acts by the Contractor or Subcontractor.

37. LIQUIDATED DAMAGES

.1 Should the Contractor fail to substantially complete the Work under this Contract within the milestone dates specified, the Owner shall be entitled to make deductions from payments due to the Contractor to compensate himself for the following:

(a) The cost of engineering services and associated expenses incurred during the extra time required to complete the Contract, valued at one-thousand ($1,000.00) per calendar day.

END OF DOCUMENT 00700

ADDENDA AND MODIFICATIONS

DOCUMENT 00900

DIVISION 1 GENERAL REQUIREMENTS

1.1 WORK UNDER THIS CONTRACT

.1 The Work under this Contract consists of construction of the 2025 Street Improvement Program for the Town of Whitecourt, hereinafter called the Owner.

1.2 WORK INCLUDED

.1 The Work includes the following components:

This project consists of milling and overlaying existing roadways at various locations within the Town of Whitecourt. A map of the 2025 Overlay Locations is attached in the Appendix B. There will also be miscellaneous roadway patching, concrete removals and replacements, drainage improvements and adjusting manhole frames, catchbasins, or water valves.

-	Roadway Paving	9,893m^2
-	Utility Cuts c/w valve or manhole adjustment	8 each
-	Concrete Sidewalks, Swales, Curb and Gutter	293 l.m.
-	Catchbasin Adjustments c/w frame and cover	3 each
-	Other Misc. Concrete	200 m^2

.2 The Work shall not be deemed complete until all components are placed in operation by the Contractor, and are operating to the satisfaction of the Owner or Engineer.

.3 Any minor item of The Work not required in the specifications or shown on the drawings but clearly necessary to meet the intent of design and normally provided for the proper operation of The Work shall be provided as if specifically called for in the Contract Documents.

1.3 DOCUMENTS REQUIRED

.1 Maintain at the job site at least one copy of each of the following:

- Contract Drawings
- Specifications
- Addenda
- Change Orders, Field Orders, Notices
- Reviewed Shop Drawings
- Modifications to the Contract

- Field Test Reports
- Construction Schedule
- Manufacturer's Installation and Application Instructions
- Occupational Health and Safety Regulations and Workers' Compensation Board Regulations;

and have readily available any referenced or specified Standards.

1.4 SPECIFICATIONS

.1 Sentence structure in parts of the specifications is abbreviated, and phrases such as "shall be," and "the Contractor shall" are deliberately omitted. Such sentences shall be read as though they are complete.

.2 The use of the word "Provide" means "supply and install"; or "supply labour and materials for the installation of". It does not mean supply only.

.3 The word "concealed" in connection with piping, electrical work, controls and wherever used in other sections shall mean "hidden from sight" as in ceiling spaces or furred out spaces, and not normally visible to persons in the construction area..

.4 The word "exposed" in connection with piping, electrical work, controls and whenever used in other sections shall mean visible to persons within a building, in normal working areas.

1.5 STANDARDS

.1 Wherever standards (e.g., CSA, ASTM and others), are referred to in these Contract Documents the current edition at the date of closing of Tenders shall apply.

.2 Where there is a clear conflict between the referenced Standard and the Contract Documents, the Contract Documents shall apply.

.3 Where there is an ambiguity between a Standard and any term of these Contract Documents, the Engineer shall, in the first instance, give an interpretation of the intent of the Contract.

END OF SECTION 01010

1.1 THE WORK SITE

.1 The Owner will provide the lands as delimited on the Drawings upon which The Work is to be constructed.

1.2 CONTRACTOR'S USE OF THE WORKSITE

.1 The Contractor shall have exclusive use and control of the Worksite, provided that the Contractor shall permit access to the Owner, the Engineer and Other Contractors on the Worksite for purposes of inspections, reviews, tests and carrying out work related to The Work.

.2 Contractor's use of the Worksite for storage is limited to the following areas, as delimited on the Drawing.

.3 The Owner shall have unfettered use of thoroughfares, streets, lanes and other areas within the Worksite until the Contractor requires those areas for execution of The Work, and after the Contractor has finished the portions of The Work in those areas.

.4 Unless otherwise agreed with the Owner, the Contractor shall give 48 hours' notice to the Owner before entering a particular area of the Worksite to execute The Work.

.5 Up to the end of the period of Notice and after the Contractor has fully completed its operations in a particular Area, the Owner shall have use of the Area and shall be responsible for Health and Safety Requirements and security in that Area.

During the Contractor's use of a particular Area of the Worksite to execute The Work, the Contractor shall be responsible primarily for security and for ensuring compliance with Health and Safety Regulations.

.6 The Contractor shall be responsible for access to the Worksite by means of temporary roads, tote roads, or agreements with the appropriate authorities to use existing means of access.

END OF SECTION 01015

1.1 TESTING ALLOWANCE

.1 The Owner may retain the services of one or more testing agencies for the purpose of quality assurance. This does not relieve the Contractor of his sole responsibility for quality control and testing.

.2 The testing agencies retained by the Owner shall be responsible directly to the Owner and not to the Contractor, nor shall the Contractor have any responsibility for quality or performances of their services.

END OF SECTION 01022

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1.1 STANDARD SPECIFICATIONS & SPECIAL PROVISIONS

.1 The clauses in this section have been written specifically for this Contract. Accordingly, subsequent information/specifications provided in this Section (01030) will take precedence over all other all other standard specifications provided.

1.2 AWARD

.1 Awarding of this Contract, in whole or in part, is subject to budget approval from the Town of Whitecourt. The Town reserves the right to not award this Contract should pricing exceed the Town's budgetary requirements.

1.3 TENDER SCHEDULES

.1 Each Schedule in Section 00304 of the Tender Form represents a different project which comprises The Work. The Town of Whitecourt will determine which Schedules will be included in the Street Improvement Program after the tenders have been received and the total budget has been approved. The Town of Whitecourt reserves the right to renegotiate prices with the successful Tenderer for any Schedules not completed in the current year, or to re-tender any Schedules which were not constructed in the following year.

.2 The Work to be performed under this Contract shall be commenced on the date specified in the "Notice to Proceed". Components shall be completed and The Work in its entirety shall be fully completed, including clean-up and rectification of all deficiencies, within the time allotments specified in Section 00304, Paragraph T-6.1, "Schedule of Completions".

1.4 CONSTRUCTION MANAGER

.1 The Contractor shall designate a Construction Manager for The Work. The Construction Manager must have a minimum of ten years of experience in road and municipal construction. While The Work is underway, the Construction Manager may work on other projects but must be available on site within sixty minutes to address construction concerns that may arise.

.2 The Construction Manager does not need to be the Contractor's superintendent.

.3 The Construction Manager shall be responsible for coordinating The Work with the shallow utility companies.

.4 The Construction Manager shall be responsible for photo documenting The Work zone prior to construction starting and for daily photographs during construction. All photographs are to be provided to the Engineer and the Town once a week.

1.5 CONSTRUCTION SCHEDULE

.1 Prior to award of this Contract, the Contractor shall provide a resource-loaded Gantt Chart type construction schedule. The construction schedule shall indicate all scheduled days off and Town of Whitecourt special events. The schedule shall

include time required for construction of any shallow utilities within The Work zone. The schedule shall also include a minimum of twenty-one weather days on which no work can be completed.

.2 In the event that The Work is behind schedule in accordance with the construction schedule provided, the Contractor shall provide an updated construction schedule which highlights the additional resources that will be provided by the Contractor in order to meet the completion dates of the original construction schedule.

.3 In the event that The Work is delayed by unforeseen events, the Contractor may request an extension to the construction schedule. All requests to extend the construction schedule shall be submitted to the Engineer in writing within three working days of the delay. Schedule extensions for weather delays will only be considered if more than twenty-one scheduled work days are lost due to inclement weather.

.4 As per the traffic accommodation strategy, the schedule shall indicate timelines when each block will be under construction.

.5 No time extensions will be provided for the completion of The Work if the Contractor has not provided the resources which were listed in the construction schedule.

1.6 SPECIAL EVENTS

.1 The Contractor is solely responsible to coordinate The Work to accommodate the Town of Whitecourt's Special Events. The Town of Whitecourt's Special Events shall be identified in the Traffic Accommodation Strategy. Coordinating The Work to accommodate Town of Whitecourt's Special Events shall be considered incidental to The Work, and no separate or additional payment shall be made.

.2 The Town of Whitecourt special events calendar can be found on the Town's website.

1.7 QUANTITY SUBMISSIONS FOR PAYMENT

.1 The Engineer shall provide the successful bidder with a digital copy of the Progress Claim Form. All submissions for payment are to be submitted using this form in order to facilitate the Engineer's review for payment. Monthly Progress Claims shall cover work completed from the first to the last day of each month. A copy of the Progress Payment Certificate shall be submitted to the Contractor within ten (10) days of submission of quantities to the Engineer. The Contractor shall indicate acceptance of the quantities by signing the summary page of the Progress Payment Certificate and returning same to the Engineer via email. Once acceptance of the quantities is received from the Contractor, the Engineer shall forward the Progress Payment Certificate to the Owner for payment.

1.8 WORK LIMITS

.1 The Contractor's attention is drawn to Section 01015 Contractor's use of the Worksite.

1.9 CERTIFICATE OF RECOGNITION

.1 The Contractor's attention is drawn to the Certificate of Recognition (COR) requirements outlined in Section 00800 SUPPLEMENTARY GENERAL CONDITIONS.

1.10 ENVIRONMENTAL MANAGEMENT

.1 The Contractor shall provide an Environmental Construction Operations (ECO) Plan in accordance with the ECO framework provided in the Appendix A. The ECO plan must be approved by the Owner and Engineer before construction commences and provision of the ECO plan is considered incidental to the project. This work is incidental to the contract.

1.11 REPORTING PROCEDURES FOR SPILLS OF DELETERIOUS OR HAZARDOUS MATERIALS

.1 During construction, any releases of silt or other deleterious substances into a body of water or watercourse shall be immediately reported to the Engineer and Alberta Environment (1-800-222-6514) and the Federal Department of Fisheries and Oceans (1-800-265-0237).

.2 In the event of the release of silt or other deleterious substance into a body of water or watercourse, the Contractor shall take all reasonable measures to contain the release and repair any damage at his expense.

.3 Spills or releases of hazardous materials shall also be immediately reported to the Engineer and Alberta Environment (1-800-222-6514), and if a body of water is involved, the Engineer and Federal Department of Fisheries and Oceans (1-800-265-0237). The Contractor shall take all reasonable measures to contain the spill and cleanup; any such work shall be performed in accordance with the applicable legislation and regulations at the Contractor's expense.

1.12 DUST & NOISE CONTROL

.1 The Contractor is responsible for all dust and noise control. This work will be considered incidental to the contract.

.2 For construction activities generating significant noise level, the hours of construction will be limited in accordance with the Town's bylaw.

1.13 NOTICES

.1 The Contractor's attention is drawn to the notification requirements outlined in Section 01040 COORDINATION, Item 6 Public Liaison.

1.14 TRAFFIC ACCOMMODATION

.1 It is the intent of the Town of Whitecourt is to have construction proceed quickly with due consideration to the Town's overall traffic flows and patterns. The successful bidder will be required to prepare Traffic Accommodation Strategies

which will allow traffic to flow safely through the site in the project without unduly restricting traffic flows throughout the Town as a whole. Special attention must be given to school zones, bus routes, and other high-priority traffic areas. The Contractor shall submit a Traffic Accommodation Plan to the Town for its review and approval at least 48 hours prior to the commencement of work.

.2 The Contractor is responsible for all costs associated with detouring traffic and pedestrians, including providing flag people, signage, and maintaining signage during the duration of the construction or in stoppages due to weather. Unless otherwise noted, these costs shall be incidental to the contract and no separate or additional payment shall be made.

.3 The Contractor is to maintain access to all business in the area. In any case where construction activities may affect access, the Contractor is responsible to advise and consult with the land owners to determine the most suitable time to commence construction activities so that impact on the business is minimized.

.4 Traffic Accommodation includes the following requirements:

(a) The Contractor shall submit a Traffic Accommodation Strategy to the Engineer and the Town of Whitecourt for all roads for approval. The Contractor shall be solely responsible for maintaining construction signage and barricades on the roads under construction for the duration of construction.

(b) The Work must not commence until the Traffic Accommodation Strategy has been approved by the Engineer.

(c) The cost of preparing and submitting the Traffic Accommodation Strategy shall be paid as part of Section 00304 T-5 Schedule of Prices “Traffic Accommodation”.

(d) The Contractor shall include a plan to maintain full, all-weather access to all businesses along the construction area.

(e) The Contractor shall obtain approval to block traffic temporarily if it is necessary to do so to perform The Work. Obtain the written approval of applicable municipal departments, the Owner and the Engineer. At least 48 hours prior to actually blocking traffic notify the following:

i) Roadway Authority

ii) Public Works Departments

iii) Utilities Companies

iv) Fire Department

v) Police Department

(f) No road may be closed to traffic without written notice and approval by the Town of Whitecourt.

(g) Haul routes shall be maintained by the Contractor. They shall be kept open to traffic and shall be clean at all times.

(h) Obtain permits as required to use public roads or streets for haul routes.

.1 Drawings indicating typical minimum requirements for traffic accommodation and construction zone temporary signing are included in the following Alberta Transportation Department manuals:

(a) Traffic Accommodation in Work Zones (most recent edition)

i) It may be necessary for the Contractor to modify these drawings and/or develop new drawings to address non-typical situations when using the Alberta Transportation (AT) Traffic Accommodation Strategy in accordance specification 7.1, Temporary Construction Signing of the Alberta Transportation Standard Specifications for Highway Construction, Edition 14, 2010.

(b) Typical drawings indicating requirements for pavement markings are included in the AT manual entitled, Alberta Highway Pavement Marking Guide, 2nd Edition, issued March 2003.

(c) Typical drawings indicating requirements for permanent highway signage are included in the AT manual entitled “Typical Signage Drawings”

(d) Typical drawings indicating requirements for barriers are included in the AT manual entitled “Typical Barrier Drawings”

(e) All other typical plans and drawings are included in the AT manual entitled “CB6 Standard Highway Construction Drawings”

1.15 SITE MAINTENANCE

.1 The Contractor shall adhere to the following maintenance procedures:

(b) Maintain The Working area in a clean and orderly manner as The Work progresses, and upon completion of construction, remove all waste materials, and all temporary facilities from the site.

(c) Remove surplus or salvaged materials belonging to the Contractor from the site.

(d) Clean haul routes.

(e) Broom clean paved surfaces, rake clean other surfaces of ground.

1.16 EXISTING UTILITIES IN OR NEAR EXCAVATIONS

.1 The Contractor shall be responsible for contacting all utility companies including but not limited to Fortis Alberta, ATCO Gas, AltaLINK, TELUS, Eastlink, and Bell Canada. The Contractor shall assume sole responsibility for ensuring that all power poles adjacent to proposed excavations are properly braced, and that all utilities are properly located, exposed prior to any ground disturbances and supported while completing construction under the lines. The Contractor shall bear the full cost of any repairs required to existing utilities due to damage caused by improper or unsafe excavating techniques, improper or incomplete locates and utility exposures, and improperly braced power poles or exposed gas lines.

.2 A representative of ATCO Gas shall be on site whenever the Contractor exposes a gas main or gas service.

.3 A Fortis Alberta representative shall be on site whenever bracing of any Fortis Alberta Electric feature (duct, power pole, tub, etc) may be required.

.4 Bracing for any utility feature, required to complete The Work outlined in this contract, shall be considered incidental to the contract.

1.17 SHALLOW UTILITIES

.1 The Contractor's attention is drawn to the Shallow Utilities requirements outlined in Section 01040 COORDINATION, Item 7 Coordination with Other Utilities and Landowners.

1.18 WASTE EXCAVATION, UNSUITABLE BACKFILL DISPOSAL & SUPPLY OF IMPORT BORROW/BACKFILL

.1 The Contractor will be responsible to ensure the material used for backfill meets the requirements provided in these contract documents.

.2 The Contractor will be responsible to apply reasonable drying techniques in an attempt to achieve suitable moisture conditioning of the native backfill. In addition, it is expected that the Contractor will make reasonable effort to excavate the native subgrade in a manner which will allow utilization of dryer/higher quality native backfill while allowing for waste excavation and disposal of very wet / lower quality native backfill.

.3 If the Contractor believes subgrade cannot be dried or is unsuitable for backfill, they must request an inspection by the Engineer. If the Engineer is in agreement that the subgrade is unsuitable for backfill, material which is not suitable shall be hauled offsite and disposed of by the Contractor.

1.19 DISPOSAL OF SCRAP MATERIAL, ACP AND CONCRETE REMOVALS

.1 The Contractor shall be responsible for disposal of all cast iron, ductile iron, or pipe materials, asphalt, concrete or other waste removed or replaced as part of this contract.

.2 Regarding concrete removals, the Contractor shall assume ownership of these materials and is responsible for loading, transporting, unloading, and disposing/stockpiling these materials at an approved site. The Contractor is permitted to utilize the Town shop as a dumping location.

.3 Upon request, the Town reserves the right to salvage any of these materials. The cost of loading, transporting, and unloading and disposing this material shall be considered incidental to the contract.

1.20 OVERHAUL

.1 Overhaul will not be paid as part of this contract.

1.21 LANDSCAPING TIE-IN FOR CONCRETE

.1 Landscaping required behind curbs and sidewalks to tie in to the existing boulevards shall be incidental to the concrete items listed under each schedule for this project.

1.22 SCHEDULE/PATCH SITE SEQUENCING

.1 The Town reserves the right to determine the priority of each Schedule/patch site for the Street Improvement Program. Prioritizing and directing some of the locations to be constructed may be dependent on items such as (but not limited to) Town events and coordination with other construction work throughout the Town.

1.23 PAVING OVER GRAVEL AND MILLED SURFACES

.1 The Contractor shall ensure that exposed gravel and milled surfaces be paved over within 7 days of removal. a temporary transition ramp is to be install for the entire width of the roadway and where each driveway or lane occurs. There is not additional compensation for this work, and it is considered an incidental to the Contract.

1.24 ASPHALT CONCRETE PAVEMENT COLD MILLING

.1 All millings obtained as part of the bid item “Asphalt Pavement Removal and Preparation, Cold Milling – 50 MM Depth” shall be retained by the Owner.

.2 The Contractor is responsible for the loading, transporting, unloading, and stockpiling of these materials at a location approved by the Owner. This location will be within 5 km of the Worksite. The cost of loading, transporting, unloading, stockpiling, and any other related work related to these items shall be considered incidental to the contract.

1.25 BACKALLEY APRON PAVING

.1 Any back alley or lane adjacent to a paved roadway shall be paved 6 m (full width) to reduce gravel migration.

.2 Any installation, removal, replacement, loading, transport of asphalt or granular base course associated with the paving shall be considered incidental to the respective bid item and no additional payment shall be granted.

.3 Payment will be made as per unit location with typical size of area as listed in the bid items in Section 00304 Tender Forms – Schedules of Price.

1.26 SPECIALIZED PAVING

.1 Where noted in Appendix B or the Schedule of Prices, certain paving locations may be difficult to access or require specialized paving equipment.

1.27 WATER VALVE REPLACEMENT, ROADWAY UTILITY CUT RESTORATION AND VALVE/FRAME ADJUSTMENT

.1 The contractor shall supply and replace the valve casing as per the Town of Whitecourt Design and Construction Standards.

.2 The Town of Whitecourt shall supply the manholes and valve extensions required for this project. The Contractor shall contact the Town for any required repairs to water valves in advance of the project commencement, and ensure all repairs are completed and all valves are raised to the proper elevation prior to paving. The Contractor is responsible for raising or lowering manholes, including providing manhole risers/rings as required.

.3 Any installation, removal, replacement, loading, transport of asphalt or granular base course associated with the adjusting of manholes or valves shall be considered incidental to the respective bid item and no additional payment shall be granted.

.4 Payment will be made as per unit location with typical size of area as listed in the bid items in Section 00304 Tender Forms – Schedules of Price.

1.28 CATCHBASIN ADJUSTMENT

.1 The Contractor shall be responsible for providing the new frame and cover in the specified style, removing the existing frame and cover, and the installing the new frame and cover. Any adjustments, risers, grouting or sealing required to accomplish the replacement shall be incidental.

The removal and replacement of the concrete surrounding the catchbasin is also included in the work, and typically consists of 8 l.m. of monolithic roll face sidewalk unless otherwise noted.

1.29 REINFORCED DRAINAGE SWALES

.1 Reinforced Drainage Swales shall be installed as per the Town of Whitecourt Design and Construction Standards. The unit price bid in the Schedule of Prices shall be full compensation for all work involved in supplying and installing the swale. The granular base course under all concrete work will be incidental to the concrete line items.

END OF SECTION 01030

1.1 GENERAL

.1 Although the specifications set forth the work of various trades under separate Divisions, it is not intended that the work of that trade is limited to or includes all work set forth in that particular Division. The Contractor shall delegate the extent of The Work to be done by the various trades and shall coordinate execution of The Work by all trades.

.2 Although the specifications are separated into titled Divisions, neither the Engineer nor the Owner will be an arbitrator to establish limits of any agreements between the Contractor and his Subcontractors.

1.2 CUTTING AND PATCHING

.1 The Contractor shall do all cutting, fitting, or patching of The Work that may be required to make its several parts come together properly and fit it to receive or be received by work of Other Contractors shown in, or reasonably implied by, the Contract Documents.

.2 Any cost caused by cutting and patching due to ill-timed work shall be borne by the Contractor.

.3 The Contractor shall not endanger any adjacent property or portion of The Work by cutting, digging or any other method, and shall be responsible for any damages caused by the Contractor.

.4 Where new work connects with existing work, and where existing work is altered, cut and patch as required.

.5 Coordinate The Work to minimize the amount of cutting and patching required.

.6 Do no cutting that may impair the strength of structures. Obtain the Engineer's approval before cutting, boring or sleeving load-bearing members.

.7 Make cuts clean and smooth and make patches equivalent to new work.

1.4 EXISTING UTILITIES IN OR NEAR EXCAVATIONS

.1 The Contractor shall be responsible for contacting all utility companies including but not limited to Fortis Alberta, ATCO Gas, AltaLINK, TELUS, Eastlink, and Bell Canada. The Contractor shall assume sole responsibility for ensuring that all power poles adjacent to proposed excavations are properly braced/held, and that all utilities are properly located and exposed prior to any ground disturbances. The Contractor shall bear the full cost of any repairs required to existing utilities due to damage caused by improper or unsafe excavating techniques, improper or incomplete locates and utility exposures, and improperly braced/held power poles or exposed gas lines.

.2 A representative of ATCO Gas shall be on site whenever the Contractor exposes a gas main or gas service.

.3 Bracing for any utility feature, required to complete The Work outlined in this contract, shall be considered incidental to the Contract.

1.5 GAS AND FIBRE OPTIC CABLE CROSSINGS

.1 The Contractor shall adhere to the terms of any Crossing Agreements. The costs of any delays in work due to work stoppages or fines incurred because of not adhering to the Crossing Agreements shall be borne by the Contractor.

1.6 CO-ORDINATION OF SUBCONTRACTORS

.1 The Contractor shall ensure that he is in direct control of the sub-Contractors to co-ordinate their activities and ensure their activities meet the overall schedule and objective of the design. Updated schedules to be provided as required to ensure construction schedule is met.

1.8 PUBLIC LIAISON

.1 The Contractor shall advertise the expected construction dates and activities in a local newspaper (2 weeks prior to start or construction). The advertisement shall be submitted to the Engineer for approval prior to placement in the newspaper.

.2 The Contractor shall notify landowners and businesses in writing of any work occurring on a road or utility adjacent to their property. Written notices are to be provided to the land owners a minimum 48 hours before the work is scheduled to commence. When the work will occur after a long weekend, 72 hours notice shall be provided. “NO PARKING” signs shall be installed a minimum twenty-four hours before construction is scheduled to begin. Alternate access to businesses and residences shall be provided wherever possible and as determined by the Town of Whitecourt. A copy of the notice shall be provided to the Engineer prior to distribution to land owners. No payment shall be made for providing notification to landowners, and all work included in preparing and distributing the notices shall be incidental to the contract.

1.10 COORDINATION WITH OTHER UTILITIES AND LANDOWNERS

.1 The Contractor shall be responsible for coordinating the WORK with the shallow utility companies. In the event that the Contractor exposes any utilities that are either unmarked or not shown on the drawings, the Contractor shall have no claim against the Town or the Engineer.

.2 The Contractor shall invite representatives of the shallow utility companies to all construction meetings. It is the Contractor’s sole responsibility to ensure that the shallow utility companies are informed about the Contractor’s construction schedule and kept aware of the construction requirements for the shallow utilities.

The known utility companies, owners and operators and their representatives are as follows:

TOWN OF WHITECOURT	(780) 778-2273 Emergency After Hours: (866) 477-1221
FORTIS ALBERTA	310-WIRE (9473)
ATCO GAS	(800) 511-3447
TELUS	(888) 811-2323
BELL	(866) 310-BELL (2355)
UTILITY SAFETY PARTNERS	(800) 242-3447

END OF SECTION 01040

1.1 ABBREVIATIONS - SPECIFICATIONS, METHODS, STANDARDS

.1 General

AASHTO	American Association of State Highway and Transportation Officials
ACI	American Concrete Institute
AISC	American Institute of Steel Construction
AISI	American Iron and Steel Institute
ARCA	Alberta Roofing Contractors Association
ASCE	American Society of Civil Engineers
ASTM	American Society for Testing and Materials
AWPA	American Wood Preservers Associations
AWS	American Welding Society
BCLMA	B.C. Lumber Manufacturer's Association
CAN	National Standard of Canada
CCA	Canadian Construction Association
CISC	Canadian Institute of Steel Construction
CITC	Canadian Institute of Timber Construction
CPCI	Canadian Prestressed Concrete Institute
CRCA	Canadian Roofing Contractors Association
CSA	Canadian Standards Association
CWB	Canadian Welding Bureau
ISO	International Organization for Standardization
NBC	National Building Code
PCI	Prestressed Concrete Institute
PMBC	Plywood Manufacturer's Association
SJI	Steel Joist Institute
SSPC	Steel Structures Painting Council
WCB	Worker's Compensation Board

.2 Utilities

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

.3 Mechanical

AFBMA	Anti Friction Bearing Manufacturer's Association
AGMA	American Gear Manufacturer's Association
AMCA	Air Moving and Conditioning Association
ANSI	American National Standards Institute
ACR	Air Conditioning and Refrigeration Institute

ASHRAE	American Society of Heating Refrigerating and Air Conditioning Engineers
NFPA	National Fire Protection Association
SAE	Society of Automotive Engineers

.4 Electrical

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

.5 Use of Abbreviations

These abbreviations refer to Specifications, Methods and Standards issued by the respective Association, and the abbreviations are used in the specifications.

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

1.2 ABBREVIATIONS - METRIC

.1 General

The specifications are metric and metric usage is based upon SI units in accordance with CSA Standard CAN/CSA-Z234.1 Canadian Metric Practice Guide. In this specification SI units are abbreviated in accordance with the Metric Units and Abbreviations below.

.2 Linear Measure

Metre	m
Millimetre	mm
Kilometre	km
micrometre	micro-m

.3 Area

Square metre	m^2
Square millimetre	mm^2
Hectare	ha

.4 Volume

Cubic metre	m^3
Litre	L

.5 Mass and Density

Kilogram	kg
Gram	g
Tonne	t
Kilogram per metre	kg/m
Gram per metre	g/m
Kilogram per square metre	kg/m^2
Gram per square metre	g/m^2
Kilogram per cubic metre	kg/m^3

.6 Temperature

Degree Celcius	°C

.7 Force, Pressure, Stress

Newton	N
Kilonewton	kN
Pascal	Pa
Kilopascal	kPa
Megapascal	MPa

.8 Velocity, Rate of Flow

Metre per second	m/s
Metre per hour	m/h
Kilometre per hour	km/h
Litre per second	L/s
Cubic metre per second	m^3/s

.9 Power, Energy, Heat, Work

Watt	W
Kilowatt	kW
Kilowatt hour	kWh
Joule	J

.10 Electricity

Ampere	A
Volt	V

END OF SECTION 01070

1.1 GENERAL

.1 Payments will be made on the basis of the lump sum prices bid and the unit prices bid in the Tender, and in accordance with Article 18 of the General Conditions.

.2 The bid prices for various items of work, unless specifically noted otherwise, shall include the supply of all labour, Plant, Material and Product equipment necessary to construct The Work in accordance with the specifications.

.3 The prices bid for supply and installation shall be full compensation for supplying, hauling, installing, cleaning, testing, and placing in service together with all other work subsidiary and incidental thereto for which separate payment is not provided elsewhere.

.4 The method of measurement of the quantities for payment and the basis for payment will be in accordance with the following items of this section. All measurement will be done by the Engineer using generally accepted field survey methods. Stationing interval for volume calculations shall not exceed 20 m.

.5 Where the Tender shows separate items for supply and installation, the unit prices or lump sum prices bid for supply shall include supplying, delivering, loading, unloading and all allowances for handling, storage, breakage and waste. Payment will be made only for Material actually installed in The Work.

Progress Payment for supply-only items shall be made only for Material and Product on the Worksite and in the Contractor’s care, and shall then become the Property of the Owner.

.6 Other materials on site, whether existing structures, vegetation, topsoil, gravel, sand or other excavated or piled materials, are the property of the Owner or of the owner of the land on which The Work is located. Only those materials specifically noted in the specification or on drawings as belonging to the Contractor shall become the Contractor’s property.

.7 Where there are excess excavated materials, unsuitable materials excavated or materials of any kind that are excavated but not used in The Work, such materials are not the property of the Contractor unless authorized in writing by the Engineer or specified to be disposed of by the Contractor.

.8 With each progress payment claim, the Contractor and any Pre-selected Supplier shall jointly certify a claim for payment for preordered Materials used or incorporated into The Work or delivered to the site of The Work during that claim period.

.9 Upon Total Completion of The Work, the Contractor shall credit the Owner for Material paid for as supplied on the Worksite, but not incorporated in The Work, and remove the surplus Material from the Worksite.

1.2 INCIDENTAL WORK

.1 The following will be considered incidental to the work but not limited to and separate payment will not be made.

(a) All costs associated with dewatering unless otherwise specified.

(b) Water used for dust control.

(c) Locating and temporarily removing, relocating or protecting existing utilities, and supporting power poles, structures, underground ducts, etc.

(d) Temporary removal and replacement of existing fences, traffic signs and structures to the original condition not specified in the tender.

(e) Maintaining existing services in operation and access to all businesses affected.

(f) Notify all affected parties of water or sanitary services interruptions and provide temporary services as required.

(g) All quality control tests of any / all products supplied to complete the work.

(h) Replacement of any lost or damaged Owner-supplied materials under the Contractor’s care.

(i) Restoration of any existing facilities damaged or disturbed during construction not specified in the tender.

(j) Coordination with utility authorities and the Owner as required.

(k) Coordination with other contractors working in the area.

(l) Contractor will be responsible for all re-tests required for the project.

(m) Testing of water valves and curb stops prior to construction.

(n) Maintenance of road sections disturbed by construction throughout construction and the maintenance period.

(o) Cleaning of tracked mud, dirt, debris, trash, etc. from roadways and other surfaces which is a result of the Contractors activities.

(p) Provision of an ECO plan as outlined in the Special Project Procedures (Section 01030)

(q) Any other incidental work related to the performance of the Contract for which separate payment is not specified.

1.3 LUMP SUM CONTRACTS

.1 Payments will be made on the basis of the following:

(a) Lump Sum items in the Schedule of Breakdown Prices in the Supplementary Tender Forms.

(b) Unit prices bid in the Schedule of Unit Prices for Provisional Work Items in the Supplementary Tender Forms.

(c) Changes in The Work for items not covered by unit prices, in accordance with Article 16 - CHANGES IN THE WORK of the General Conditions.

.2 For each Lump Sum item in the Schedule of Breakdown Prices, the Engineer will, in cooperation with the Contractor, estimate the percentage of the item completed at the end of the payment period.

1.4 UNIT PRICE CONTRACTS

Should the information in this section conflict with division 2 or division 3 of this document, this section shall govern.

.1 Mobilization and Demobilization

(a) Mobilization and demobilization shall include the Contractor’s costs of mobilization at the beginning of the project; and the costs of demobilization at the end of the project.

(a) Included in mobilization are such items as bonding, insurance, permits, moving personnel, materials and equipment to the site, setting up temporary facilities and all preparation for performing The Work.

(b) Included in demobilization are preparation and submission of operation and maintenance manuals, removal of all personnel, materials and equipment; and cleanup of the site and The Work.

(c) The lump sum price bid for this work shall be relative to the costs involved but shall not exceed ten percent of the Tender Price.

(d) Payment will be made as follows, as approved by the Engineer:

i) 60% of the lump sum bid will be included in the first progress payment certificate;

ii) 40% of the lump sum bid will be included in the final progress payment certificate.

The Engineer may at his discretion recommend partial payment if mobilization or demobilization are not complete.

(e) With respect to Division 1 General Requirements, payment will be made as specified for demobilization and mobilization. The costs of other items specified under General Requirements shall be considered as incidental to The Work; and separate payment will not be made for any other items of General Requirements.

.2 Traffic Accommodation

Traffic Accommodation includes requirements as outlined in the Special Project Procedures.

Payment: 25% payment will be made when the TAS is approved; 50% payment will be made when all features of the TAS have been implemented and are operational; the final 25% will be paid when the requirements of the TAS have concluded provided the requirements of the TAS have been adequately maintained during construction.

The Engineer may at his discretion recommend partial payment.

Measurement: Lump Sum.

END OF SECTION 01150

1.1 PRECONSTRUCTION MEETING

.1 Preconstruction meetings will be arranged by the Engineer after the Acceptance of a Tender.

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

.3 The agenda for the Preconstruction Meeting shall include, but is not limited to, the following:

(a) Confirm the Superintendent, Contractor's Construction Manager, and the Engineer's Resident personnel on the Worksite.

(b) Establish Worksite protocols for communication, reporting, inspection, etc.

(c) Clear up any ambiguities or questions of interpretation known at that time.

(d) Contractor shall present its detailed Work Schedule.

(e) Occupational Health and Safety relationships and responsibilities.

(f) Discuss other responsibilities of the Owner, the Contractor, and the Engineer. Review General Conditions 5 to 11, inclusive.

1.2 PROGRESS MEETINGS

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

.2 Accommodation for progress meetings shall be provided by the Contractor at or near the site.

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

.4 The Contractor shall have in attendance the Superintendent, the Contractor's Construction Manager, and representatives of the Subcontractors if requested by the Engineer.

.5 The Contractor shall be responsible for ensuring that representatives from the shallow utility companies attend the progress meetings.

.6 The Engineer will have the Engineer's Project Manager or the Resident Engineer, or both, in attendance.

.7 The Owner may have a representative in attendance.

.8 Occupational Health and Safety incidents, records and procedures shall be part of the agenda for every progress meeting.

.9 Minutes will be taken by the Engineer and copies will be distributed to all attendees.

1.3 SAFETY MEETINGS

.1 The Contractor shall hold a safety meeting before any Work is started, and before any Subcontractor starts any Work. Additionally, the Contractor shall have a minimum of one (1) safety meeting each week.

A copy of all Safety Meeting minutes shall be provided to the Engineer.

END OF SECTION 01200

1.1 GENERAL

.1 Submittals are required in accordance with the provisions of this section, to determine whether the specified Material and Product are furnished and installed in accordance with design intent as expressed in the Contract Documents.

.2 Individual submittals as required are detailed in other sections of the specifications.

.3 Until submissions are reviewed, work involving relevant Product or Material may not proceed.

.4 Where the phrase "or approved equivalent alternative" occurs in the Contract Documents, do not assume that Material, Product or methods will be accepted as equal by the Engineer unless the item has been specifically accepted for The Work by the Engineer in writing.

1.2 IDENTIFICATION OF SUBMITTALS

.1 Identify each submittal and resubmittal by showing at least the following information:

(a) Name, address and telephone number of the submitter, and a name of an individual for contact.

(b) Drawing number and specification number to which the submittal applies.

(c) Whether an original submittal or resubmittal.

(d) Confirmation of prior review by the Contractor.

(e) Date of submittal or resubmittal.

(f) Authorized signature of the Submitter.

1.3 COORDINATION OF SUBMITTALS

.1 Prior to submittal for the Engineer's review, coordinate all material:

(a) Determine and verify field dimensions and conditions and conformance with specifications, including Material, catalogue numbers, type numbers and similar data.

(b) Coordinate requirements between trades.

(c) Coordinate with requirements under laws, regulations, etc.

(d) Secure required approvals of public agencies, inspection agencies and standards agencies and show proof of approvals acquisition.

(e) Indicate any deviations from the intent of design as expressed in the Contract Documents and request specific review of these deviations.

1.5 TIMING OF SUBMITTALS

.1 Make submittals far enough in advance to allow adequate time for coordination, Engineer's review, revisions and resubmittals, and for supply and delivery in time for the scheduled installation in The Work.

.2 Allow at least ten calendar days for the Engineer's review after receipt of submittals. The Engineer will make every effort to review the submittals in a timely and expedient manner.

.3 Costs due to delays in making submittals shall be borne solely by the Contractor.

END OF SECTION 01300

1.1 CONSTRUCTION SCHEDULE

.1 Upon award of the Contract and prior to commencement of The Work, the Contractor shall submit for approval to the Engineer a construction schedule in critical path method format showing all the principal phases of the work. No Progress Payment Claim shall be certified until an acceptable Construction Schedule has been received by the Engineer.

(a) The Construction Schedule shall be updated monthly against actual progress of The Work by the Contractor.

(b) If, in the opinion of the Engineer, any Construction Schedule is inadequate as a control tool or if it does not show The Work being fully completed by the Contract Completion Date, the Engineer may reject it and the Contractor shall provide a Construction Schedule and work program that is acceptable to the Engineer.

(c) The Contractor shall account for any statutory holidays and long weekends during the construction period as construction will not take place on these days/weekends unless otherwise approved by the Engineer and Town.

(d) Once the detailed construction schedule is submitted and approved by the Engineer, the Contractor shall adhere to the schedule and do whatever is necessary to keep his operation(s) to the approved schedule.

(e) Upon the Engineer’s request, the Contractor shall submit an updated construction schedule. The construction schedule shall indicate all construction activities completed and demonstrate how the project will be brought back on schedule.

(f) The schedule provided by the Contactor can be expected to reasonably account for an average of 1 rain/weather day per week of full time work completed. If during construction, an average of more than 1 rain/weather day per week is experienced the construction schedule may be adjusted accordingly. In order to qualify for schedule adjustments, the contractor is responsible to notify the Engineer in writing (email) and the Engineer must be in agreement that the weather conditions experienced prevent work from being completed during that day. It is expected that this notification will be provided to the Engineer within 48 hours of experiencing the rain/weather day.

(g) Other conditions causing delays which cannot be reasonably controlled by the Contractor may result with a schedule extension. The request for a schedule extension should be provided to the Engineer within one week of experiencing the delay and provision of the extension will be at the sole discretion of the Engineer.

(h) The Contractor offers to begin The Work within the period specified in the "Notice to Proceed," and to prosecute The Work in such a manner as to achieve the

following completion periods. Completion includes all clean-up and rectification of all deficiencies.

.2 The Work on all Schedules (located in the Schedule of Prices) shall be completed by August 15 of the current contract year, including all required landscaping and cleanup work. The Contractor shall not be permitted to complete portions of the Schedules/patch sites. Once executed, each Schedule/patch site shall be completed in its entirety prior to the completion date of August 15 of the current contract year. The Contractor also agrees that any outstanding Schedules/patch sites not completed as part of the current year's Street Improvement Program will be deferred and re-tendered as part of the next year's program.

END OF SECTION 01310

1.1 REQUIREMENTS FOR SHOP DRAWINGS AND PRODUCT DATA

.1 The Contractor shall arrange for the preparation of clearly identified shop drawings and submit shop drawings in the following forms:

(a) Two prints to be retained by the Engineer plus those required by the Contractor.

(b) The Contractor shall provide clearly identified Product Data and submit two prints to be retained by the Engineer plus those required by the Contractor.

Product Data shall include but not be limited to:

i) Product assembly drawings

ii) Materials list

iii) Principal dimensions

iv) Parts and components details

v) Letters of compliance with recognized standards where required

vi) Operation data

vii) Operation curves

viii) Operation manuals where specified

ix) Product Name and Model Number

.2 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 and shall have sufficient space for the Contractor's stamp and the Engineer's stamp.

.3 Shop drawings shall be in accordance with the International System of Units (S.I.) metric units.

.4 Prior to submission to the Engineer the Contractor shall review all shop drawings. By this review, the Contractor represents that he has determined and verified all field measurements, field construction criteria, materials, catalogue numbers and similar data or will do so, and that he has checked and coordinated each shop drawing with the requirements of The Work and of the Contract Documents. The Contractor's review of each shop drawing shall be indicated by stamp, with the date and signature of a responsible person.

.5 The Contractor shall submit shop drawings to the Engineer for his review with reasonable promptness and in orderly sequence so as to cause no delay in The Work or in the work of Other Contractors. If either the Contractor or the Engineer

so requests they shall jointly prepare a schedule fixing the dates for submission and return of shop drawings.

.6 At the time of submission, the Contractor shall notify the Engineer in writing of any deviations in the shop drawings from the requirements of the Contract Documents.

.7 The Engineer will review and return shop drawings in accordance with a schedule agreed upon, or otherwise with reasonable promptness. The Engineer's review shall be for conformity to the design concept and for general arrangement only and such review shall not relieve the Contractor of responsibility for errors or omissions in the shop drawings or of responsibility for meeting all requirements of the Contract Documents. A specific deviation on the shop drawings from the design concept requested by the Contractor may be approved or rejected in writing by the Engineer.

.8 The Contractor shall make any changes in shop drawings which the Engineer may require consistent with the Contract Documents and resubmit unless otherwise directed by the Engineer. When resubmitting, the Contractor shall notify the Engineer in writing of any revisions made by the Contractor other than those requested by the Engineer, in his previous review.

.9 Each reviewed shop drawing will be stamped by the Engineer with the following form of stamp:

REVIEWED	( )
REVIEWED AS MODIFIED	( )
REVISE AND RESUBMIT	( )
NOT REVIEWED	( )

Review by the Engineer is for the sole purpose of ascertaining conformance with the general design concept. This review shall not constitute approval of the detail design inherent in the shop drawings, responsibility for which shall remain with the Contractor submitting same. Review by the Engineer shall not relieve the Contractor of his responsibility for errors or omissions in the shop drawings or of his responsibility for meeting all requirements of the Contract Documents.

The Contractor is responsible for dimensions to be confirmed and correlated at the job site, for information that pertains solely to fabrication processes or to techniques of construction, for installation, and for co-ordination of the work of all sub-trades.

Engineer
By:
Date:

1.2 DESIGN BY THE CONTRACTOR

.1 When the Contractor is responsible for engineering design of portions of The Work, this shall be clearly and specifically indicated in the drawings or in the specifications of the Contract Documents.

.2 Where the Contractor is required, either by law or regulation or by the Contract to provide engineering design, he shall use the services of a Professional Engineer registered in the area in which The Work is to be performed, and he shall submit Shop Drawings bearing the Seal and Signature of that Registered Professional Engineer.

END OF SECTION 01340

1.1 RECORDS DURING CONSTRUCTION

.1 The Contractor shall keep one complete set of all construction drawings on the Worksite.

.2 On the Contractor's Worksite set of Contract Drawings, the Contractor shall record any changes that are made during the actual construction of The Work. The purpose of recording these changes is to provide drawings of record at the end of The Work. The Contractor shall be responsible for the adequacy and the reliability of the information recorded on the drawings of record.

.3 At the completion of the construction period, the Contractor shall turn over the set of construction drawings which have been marked up with changes during the course of The Work to the Engineer to permit the Engineer to prepare Drawings of Record for The Work.

END OF SECTION 01390

1.1 GENERAL

.1 The Contractor is totally responsible for the quality of Material and Product which he provides and for The Work.

.2 The Contractor is responsible for quality control and shall perform such inspections and tests as are necessary to ensure that The Work conforms to the requirements of the Contract Documents.

.3 During the progress of The Work, a sufficient number of tests shall be performed by the Contractor to determine that Material, Product and installation meet the specified requirements.

.4 The Contractor shall perform as many inspections and tests as are necessary to ensure that The Work conforms to the requirements of the Contract Documents.

.5 Testing shall be in accordance with pertinent codes and regulations, and with selected standards of the American Society for Testing and Materials (ASTM) and Canadian Standards Association (CSA).

1.2 QUALITY ASSURANCE TESTING BY THE OWNER

.1 The Owner may retain and pay for the services of an independent testing agency for testing for quality assurance, for the Owner's purposes.

.2 The Owner's testing agency and the Engineer may inspect and test Material, Product and The Work for conformance with the requirements of the Contract Documents; however, they do not undertake to check the quality of The Work on behalf of the Contractor nor to provide quality control.

.3 Inspections and tests by the Owner's testing agency and by the Engineer do not relieve the Contractor of his responsibility to supply Material and Product and to perform The Work in accordance with the requirements of the Contract Documents.

.4 The Engineer, at his discretion, may order or perform any additional inspections and tests for purposes of his own or for purposes of the Owner.

.5 The Contractor shall coordinate with the Engineer the scheduling of testing and inspection by the Owner's testing agencies or by the Engineer, to enable testing to be done as necessary, without delay, and the Contractor shall notify the Engineer sufficiently in advance of operations to allow for such inspection and tests by the Engineer's or the Owner's testing agency.

1.3 CODE COMPLIANCE TESTING

.1 Inspections and tests required by codes or ordinances, or by a plan approval authority, shall be the responsibility of and shall be paid for by the Contractor.

.2 Copies of reports resulting from such inspections shall be submitted in a timely manner by the Contractor to the Owner.

1.4 RETESTING

.1 When tests on Product, Material or completed portions of The Work carried out by the Contractor or the Contractor's testing agency or by the Owner's testing agency yield results not meeting the requirements of the Contract Documents, the Contractor, in addition to carrying out remedial work or replacement of the Product or Material shall provide for retesting of the remedied work and the replacement Product and Material. Retesting, including retesting by the Owner's testing agency, shall be at the Contractor's expense.

.2 In every case where the Contractor has submitted test results which fail to meet the requirements of the Contract Documents, the Contractor shall submit within a practical and reasonable time results of a retest showing that the results are in accordance with the requirements of the Contract Documents.

.3 If the Contractor fails or refuses to do remedial work or replace unacceptable Material or Product, the Engineer may refuse to certify payment and the Owner may refuse to make payment, in addition to any other remedies the Owner may have.

END OF SECTION 01400

PART 1 - TEMPORARY UTILITIES

Temporary Utilities as outlined below will be considered incidental to the Contract and no separate payment shall be made. The Contractor is responsible to:

1.1 NATURAL GAS, GASOLINE AND OTHER FUELS

.1 Provide and pay all costs for natural gas, gasoline and other fuels required for the performance of The Work, in accordance with governing regulations and ordinances, and the Contract Documents.

.2 Furnish and install all necessary temporary piping and upon completion of The Work remove all such temporary piping.

1.2 WATER

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

.2 Furnish and install all necessary temporary piping and upon completion of The Work remove all such temporary piping.

1.3 ELECTRICITY AND LIGHTING

.1 Provide and pay all costs for electricity and artificial lighting required for the performance of The Work, in accordance with governing regulations and ordinances, and the Contract Documents.

.2 Furnish and install all necessary temporary wiring, distribution boxes, panels, etc., and upon completion of The Work, remove all such temporary installations.

1.4 TELEPHONE

.1 Provide, maintain and pay all costs for a telephone for the Contractor's use.

.2 A telephone is not required for the Engineer's use on this project.

1.5 SANITARY FACILITIES

.1 Furnish and install all required temporary toilet buildings with sanitary toilets for use of all workmen; comply with all minimum requirements of the Health Department or other public agency having jurisdiction; maintain in a sanitary condition at all times.

1.2 FIRE PROTECTION

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

.2 Furnish and install temporary extinguishers, hydrants and other equipment, and upon completion of The Work remove all such temporary equipment.

PART 2 - CONSTRUCTION AIDS

2.1 TEMPORARY EXCAVATION

.1 The Contractor is responsible for the means and methods of making temporary excavations in order to install components of The Work.

2.2 ACCESS ROADS

.1 The Contractor shall construct temporary access roads as necessary to perform The Work, and maintain temporary access roads until construction is over or until permanent access is established.

.2 Locations and drainage facilities for temporary access roads are subject to the approval of the Engineer.

.3 No direct payment will be made to the Contractor for construction of temporary access roads.

PART 3 - PROTECTION

.1 The Contractor shall remove trees, fences and other structures from the site of The Work, as necessary to perform The Work.

.2 Remove only those items that must be removed, or are clearly shown on the drawings to be removed.

.3 Protect all remaining trees, plants, fences and other items from damage during construction.

PART 4 - EXISTING UTILITIES AND STRUCTURES

.1 Existing utilities and structures include pipes, culverts, ditches or other items which are a part of an existing sewerage, drainage or water system; or which are a part of a gas, electrical, telephone, television, telecommunications or other utility system. Also included are sidewalks, curbs, gutters, swales, poles, fences or any other structures encountered during construction.

.2 The Contractor shall be responsible for location, protection, removal or replacement of existing utilities and structures, or for repair of any damage which may occur during construction.

.3 Existing utilities and structures may be shown on the drawings, or described in the specifications. Such information is shown for design purposes and the existence, location and detail given is information that is obtained during the design period and is not necessarily complete, correct or current.

.4 Unless specifically detailed elsewhere in these documents, the Contractor shall pay all costs and be responsible for establishing locations and state of use of all existing utilities that may affect The Work. The Contractor shall make satisfactory arrangements with the utilities companies involved for the location, protection and inspection of existing utilities.

.5 Notice in writing shall be given by the Contractor to the utilities companies at least 48 hours before work commences in the vicinity of existing utilities.

.6 The Contractor shall pay all the costs involved in protection of utilities, inspection of utilities, and all costs due to delays because of existing utilities and structures.

.7 The Contractor shall provide for the uninterrupted flow of all water courses, sewers and drains encountered during The Work.

.8 Access shall be maintained to all existing structures such as valves, hydrants, meter chambers and control structures at all times during construction.

.9 If interruption of service provided by an existing utility is necessary, the planned shut-down shall be approved by the owners of the utilities. Requests for shut-down shall be made by the Contractor in writing at least 48 hours in advance.

.10 The Contractor shall notify all customers or make arrangements with the utility company to notify all customers 24 hours in advance of a shut-down.

.11 Unless otherwise specified the Contractor shall make arrangements for relocation of existing utilities that the Engineer requests to be relocated; and the actual relocation shall be constructed by the Owner of the utility. The Contractor will be reimbursed the invoiced cost of the relocation. No extra payment is permitted for delays, or standby time.

PART 5 - TEMPORARY CONTROL

The Contractor is responsible to:

5.1 NOISE CONTROLS

.1 Perform The Work in conformity with all municipal by-laws with respect to noise, hours of work, night work and holiday work. Night work or holiday work requires the written permission of the Engineer.

5.2 DUST CONTROL

.1 Perform The Work in a manner that will not produce an objectionable amount of dust. Dust control measures shall be paid for by the Contractor.

5.3 POLLUTION CONTROL

.1 Perform The Work in conformance with the applicable sections of the Provincial Regulations with respect to air and water pollution control requirements.

5.4 DISPOSAL OF WASTES

.1 Burying of rubbish and waste on site is not permitted.

.2 Disposal of waste or volatile materials into waterways, storm or sanitary sewers is not permitted.

.3 Pumping or draining water containing silt in suspension into waterways, sewers or drainage systems is prohibited.

.4 Abide by requirements of Statute, Bylaw and Regulations respecting disposal of wastes.

.5 Obtain required Permits for waste disposal.

5.5 TRAFFIC CONTROL

.1 Refer to Section 01030 – Special Project Procedures.

5.6 CONTRACTOR'S FIELD OFFICE

.1 No field office for the sole use of the Contractor is required for this project.

5.7 ENGINEER'S FIELD OFFICE

.1 No field office for the sole use of the Engineer is required for this project.

END OF SECTION 01500

1.1 QUALITY

.1 Material and Product supplied and installed shall be new.

.2 Material and Product supplied shall conform to these specifications and to specified standards.

.3 Workmanship shall be the best quality, executed by workmen experienced and skilled in their respective trades.

.4 Ensure full cooperation among all trades and coordination of The Work with continuous supervision.

.5 Use Product for which replacement parts and service are readily available.

.6 Use Product of one manufacturer for Product of the same type or classification. Do not mix different manufacturer's Product in The Work or in parts of The Work.

1.2 MANUFACTURER'S INSTRUCTIONS

.1 Unless otherwise specified, comply with the Manufacturer's/Supplier's instructions for Material or Product and installation methods.

.2 Notify the Engineer in writing of any conflict between these Contract specifications and the instructions of the Manufacturer/Supplier.

1.3 DELIVERY AND STORAGE

.1 Deliver, store and maintain packaged Material and Product with manufacturer's seals and labels intact.

.2 Prevent damage and soiling of Material and Product.

.3 Store Material and Product in accordance with instructions of the Manufacturer/Supplier.

.4 Provide suitable areas or buildings where storage is weatherproof, if dry areas are recommended by the Manufacturer/Supplier.

.5 Comply with Work Place Hazardous Materials Information Systems requirements.

END OF SECTION 01600

1.1 CLEANUP

.1 Maintain the working area in a clean and orderly manner as The Work progresses, and upon completion of construction, remove all waste materials, and all temporary facilities from the site.

.2 Haul surplus or salvage materials that are the property of the Owner to the prescribed location.

.3 Remove surplus or salvaged materials belonging to the Contractor from the site.

.4 Clean haul routes.

.5 Broom clean paved surfaces, rake clean other surfaces of ground.

END OF SECTION 01700

PART 1 – GENERAL

1.1 SECTION INCLUDES

.1 This specification covers the supply and installation of permanent and temporary environmental protection devices, including silt fences, synthetic permeable barriers, erosion control soil covering, and rock check dams.

1.2 RELATED SECTIONS

.2 Section 02050 – Demolition

.3 Section 02217 – Roadway Excavation, Compaction and Backfill

.4 Section 02231 – Granular Road Base

.5 Section 02528 – Sidewalks, Curbs, Gutters

.6 Section 02713 – Water Main and Appurtenances

.7 Section 02714 – Hot-Mix Asphaltic Concrete Paving

.8 Section 02745 – Asphalt Prime and Tack Coat

1.3 REFERENCES

.1 Environmental Construction Operations (ECO) Plan Framework, 2013 Edition, Alberta Transportation, the City of Edmonton, the City of Calgary.

.2 Erosion and Sediment Control Manual – June 2011, Alberta Transportation

.3 Design Guidelines for Erosion and Sediment Control for Highways (2003), Alberta Transportation

.4 American Society for Testing and Materials (ASTM)

(a) ASTM D4355-07 Standard Test Method for Deterioration of Geotextiles by Exposure to Light, Moisture and Heat in a Xenon Arc Type Apparatus

(b) ASTM D4491-99a(2009) Standard Test Methods for Water Permeability of Geotextiles by Permittivity

(c) ASTM D4632/D4632M-08(2013)e1 Standard Test Method for Grab Breaking Load and Elongation of Geotextiles

(d) ASTM D4751-12 Standard Test Method for Determining Apparent Opening Size of a Geotextile

(e) ASTM D6460-12 Standard Test Method for Determination of Rolled Erosion Control Product (RECP) Performance in Protecting Earthen Channels from Stormwater-Induced Erosion

.5 Erosion Control Technology Council (ECTC)

(a) ECTC Test Method #2 – Effectiveness, March 20, 2012

1.4 DEFINITIONS AND ABBREVIATIONS

ECO Plan: Environmental Construction Operations Plan

B.M.P.: Best Management Practice

UV: Ultra violet

MARV: Minimum Average Roll Value

RECP: Rolled Erosion Control Products

ECB: Erosion Control Blankets

OWT: Open Weave Textiles

TRM : Turf Reinforcement Mats

C-TRM: Composite Turf Reinforcement Mats

1.5 MEASUREMENT AND PAYMENT

.1 Permanent and Temporary Environmental Protection Devices provided and installed as part of the Contractor's Environmental Construction Operations (ECO) Plan will be considered incidental to The Work and no separate or additional payment will be made.

.2 Permanent and Temporary Environmental Protection Devices which are detailed in the drawings will be paid for at the appropriate unit rate. This will be considered full payment for all labour, materials, equipment, tools, and incidentals required to complete The Work to the satisfaction of the Engineer:

(a) Synthetic Permeable Barriers will be measured along the centre line of the barriers installed, excluding overlap.

(b) Silt fence will be measured along the length of the silt fence installed, excluding overlap.

(c) The cost to supply and install geotextile installed under riprap will be included in the unit price bid for the riprap and no separate or additional payment will be made.

(d) Geotextile will be measured in square metres installed, excluding overlap.

(e) Rolled Erosion Control Products will be measured in square metres installed, excluding overlap.

(f) Permanent RECPS – Turf Reinforcement Mats (TRM) will be measured in square metres installed, excluding overlap.

(g) The supply and installation of pins will be considered incidental to The Work and no separate or additional payment will be made.

PART 2 – PRODUCTS

2.1 MATERIALS

.1 Synthetic Permeable Barriers

(a) Permeable barriers are made of UV stabilized high density polyethylene, firmly anchored to the ground, and capable of reducing runoff velocity for storm channels and highway ditches. Typical dimensions are, height = 250 mm, length = 1,000 mm.

(b) For high flow conditions, erosion control matting must be used in conjunction with the barriers to reduce runoff velocity and erosion.

(c) Any product that meets the requirements of the Design Guidelines for Erosion and Sediment Control for Highways (2003), Best Management Practices (BMP #10) qualifies under this section.

.2 Silt Fence

(a) Geotextile Fence Barrier shall comprise a low fence made from geotextile material and placed at locations to retain silt and preventing silt contamination during construction. Minimum height of silt fence shall be 750 mm. Minimum embedment depth of the fabric shall be 150 mm.

(b) Any product that meets the requirements of the Design Guidelines for Erosion and Sediment Control, Best Management Practices (BMP #1), qualifies under this section.

.3 Material: Woven or non-woven geotextile

TABLE 01900 – 1
SILT FENCE MATERIAL PROPERTIES

Property	Test Method	Geotextile Requirements
Maximum post spacing (m)	ASTM D4632	2
Elongation	ASTM D4632	<50%
Grab Strength (N)	ASTM D4632	
Machine direction		550
X-Machine direction		450
Permittivity (sec-1)	ASTM D4491	0.05
Apparent Opening Size (mm)	ASTM D4751	0.60 max avg. roll value
Ultraviolet stability (% retained strength)	ASTM D4355	70% after 500 hrs. of exposure

Note: All numeric values represent MARV (Minimum Average Roll Value) in the weaker principal direction.

.4 Rolled Erosion Control Products (RECP)

(a) Rolled Erosion Control mats or blankets are made from coconut fibers, wood excelsior, jute, and polypropylene or nylon fibers. They are used to reduce erosion and create conditions to assist the establishment of vegetation. Any product that meets the performance properties below and requirements of Design Guidelines for Erosion and Sediment Control for Highways, 2003 (BMP#13) qualifies under this section.

(b) No products made with straw will be permitted.

(c) Temporary Erosion RECPS – Erosion Control Blankets (ECB) and Open Weave Textiles (OWT)

(d) Erosion Control Blankets are temporary degradable RECPs composed of processed degradable natural and/or polymer fibres mechanically bound together by a single or between two (2) degrading, synthetic or natural fibre netting(s). For environmental friendly applications, some nettings may contain 100% biodegradable natural organic fibres.

(e) Open Weave Textile is a temporary degradable RECP composed of processed natural or polymer yarns woven into a matrix, used to provide erosion control and facilitate vegetation establishment.

TABLE 01900 – 2
EROSION CONTROL BLANKET TYPES AND PROPERTIES

Material	Performance Properties for Slopes	Performance Properties for Channels
	Cover Factor, C[1], [2]	Permissible Shear Stress [3], [4] (N/m2)
Type A: (<12 months Functional Longevity) Single-net Erosion Control Blankets and Open Weave Textiles	≤ 0.15 @ 3:1 (h:v) and flatter	72
Type B: (<12 months Functional Longevity) Double-net Erosion Control Blankets and Open Weave Textiles	≤ 0.20 @ 2:1 (h:v) and flatter	84
Type C: (>12 months Functional Longevity) Erosion Control Blankets and Open Weave Textiles	≤ 0.25 @ 1:1 (h:v) and flatter	96

[1] C-factor calculated as ratio of soil loss from RECP protected slope to ration of soil loss from unprotected (control) plot in large-scale testing. These performance test values should be supported by periodic bench testing under similar test conditions using ECTC Test Method #2.
[2] Acceptable large-scale testing protocol may include ASTM D6459 or other independent testing deemed acceptable by the department engineer.
[3] Minimum shear stress RECP (unvegetated) can sustain without physical damage or excess erosion [>12.7 mm soil loss] during a 30-minute flow event in large-scale testing. These performance test values should be supported by periodic bench scale testing under similar test conditions using ECTC Test Method #2.
[4] Acceptable large-scale testing protocol may include ASTM D6460 or other independent testing deemed acceptable by the Engineer.

.5 Permanent RECPS – Turf Reinforcement Mats (TRM)

(a) TRMs are long-term, non-degradable rolled erosion control products composed of uv stabilized, non-degradable, synthetic fibres, filaments, nettings and/or mesh processed into 3-dimensional reinforcement matrices designed for permanent and critical hydraulic applications where design discharges exert velocities and shear stresses that exceed the limits of mature, natural vegetation. Turf reinforcement mats provide sufficient thickness, strength and void space to permit soil filling and/or retention and the development of vegetation within the matrix. Some TRM included in

this category, may contain organic materials and may be termed as composite turf reinforcement mats (C-TRM).

TABLE 01900 – 3
TURF REINFORCEMENT MATS TYPES AND PROPERTIES

Material	Performance Properties for TRM	
	Permissible Shear Stress (3), (4), (5) (N/m^2)	**Permissible Shear Stress (N/m^2)**
Turf Reinforcement Mats (1), (2)		
TRM Type A	288	1.82
TRM Type B	384	2.19
TRM Type C	480	2.55

(1) For TRMs containing degradable components, all property values must be obtained on the non-degradable portion of the matting alone.
(2) Minimum thickness of TRM is 6.35 mm.
(3) Shear stress that fully vegetated TRM can sustain without physical damage or excess erosion [>12.7 mm soil loss] during a 30-minute flow event in large-scale testing.
(4) Acceptable large-scale testing protocol may include ASTM D6460 or other independent testing deemed acceptable by the ENGINEER.
(5) Field conditions with high loading and/or high survivability requirements may warrant the use of a TRM with a tensile strength of 44 kN/m or greater.

.6 Pins

(a) Pins shall be made, in either a T or U shape, from 4 mm diameter (minimum) galvanized wire. T-shaped pins shall be made from a single length of wire to a height of 200 mm after bending. The bar of the T shall be 100 mm wide and the free end of the wire shall be bent downward approximately 20 mm. U-shaped pins shall have 200 mm long parallel legs spaced 25 mm apart at the crown.

(b) The CONTRACTOR shall have the option of supplying biodegradable plastic or wooden pins as alternatives to galvanized wire.

(c) For synthetic permeable barriers, the pins shall be in accordance with the manufacturer's recommendations.

.7 Rock

(a) Rock shall meet the requirement shown on the Drawings in accordance with Section 2271 – Riprap.

.8 Stakes

(a) Stakes used for silt fence shall be new, construction grade or better spruce wood cut from sound timber, and shall be free from any form of decay. The stake dimensions shall be in accordance with the Best Management Practice. Broken or split ended stakes will not be acceptable. Stakes cut from other types of wood may be used subject to the prior approval of Engineer.

PART 3 – EXECUTION

3.1 ECO PLAN PREPARATION

.1 The Contractor shall prepare an ECO Plan in accordance with the Environmental Construction Operations (ECO) Plan Framework. The ECO Plan shall outline all permanent and temporary environmental protection devices the Contractor intends to use to during construction. The Contractor shall submit the ECO Plan to Engineer for review and acceptance.

.2 The Contractor shall monitor the implementation of the ECO Plan and in the event that the permanent and temporary environmental protection devices need to be adjusted or supplemented, the Contractor shall submit an updated ECO Plan to Engineer for review and acceptance.

3.2 EROSION CONTROL BARRIER (SILT FENCE)

.1 Silt fence barriers shall be constructed as early as practicable to maximize the entrapment of silt, and shall be placed along the contour of the fill slopes at the elevation specified or as directed by Engineer. The terminal ends of the barrier shall be at a marginally higher elevation to prevent water from bypassing them.

.2 The geotextile used in the fence construction shall be self-edged at the top and shall be buried at the lower end in a shallow trench on the upstream side of the fence line as shown in the B.M.P.

3.3 ROLLED EROSION CONTROL PRODUCTS

.1 Soil covering shall be placed immediately following seeding and fertilizing operations. The Contractor shall ensure that the ground surface is free from stones, or other debris, which would interfere with the uniform contact of the covering within the soil.

.2 Soil coverings shall be unrolled in the direction of expected water flow and shall be applied without stretching so that they loosely, but smoothly, contact the soil surface. The top end of any ditch or slope installation shall be stapled and buried in a narrow trench that is at least 150 mm deep. The soil backfill in the trench shall be firmly tamped in place.

.3 Longitudinal laps in covering installation shall be achieved by excavating a check slot of 150 mm minimum depth, at the location of the lap, and burying the upper end of the downslope blanket in the slot. The upslope covering shall then overlap the downslope one by a minimum of 150 mm. Coverings lying side by side shall be lapped a minimum of 100 mm.

.4 Additional check slots shall be provided at a spacing of 15 m along slopes and 10 m along ditches measured parallel to the ground slope. The covering shall be folded to contact the cross-section of the slot and stapled in place. The trench shall then be firmly tamped.

.5 Pinning of R.E.C.P. shall be as shown in the B.M.P. A common row of pins shall be used for all laps.

3.4 ROCK CHECK DAMS

.1 The rock check dam shall be constructed in a 0.15 m deep key trench as shown in the B.M.P. Typically, the weir crest shall be 0.5 m above the ditch bed elevation unless otherwise directed by Engineer.

3.5 SYNTHETIC PERMEABLE (DITCH) BARRIER

.1 The Contractor shall integrate barrier installation with the installation of erosion control soil covering within ditch areas. Synthetic permeable barriers shall be shall be installed in accordance with the Manufacturer's recommendations unless otherwise specified in the B.M.P. No. 10.

3.6 MAINTENANCE

.1 All permanent environmental protection devices shall be maintained by the Contractor until the issuance of the Construction Completion Certificate. At no time shall silt or debris build-up be allowed to exceed more than one-half of the above ground vertical height of the structure.

.2 Damage to the permanent environmental protection devices, for whatever reason, shall be immediately repaired by the Contractor to the satisfaction of Engineer.

.3 The Contractor shall assume ownership of all silt and debris trapped by the permanent environmental protection devices and shall dispose of this material to the satisfaction of Engineer.

END OF SECTION 01900

DIVISION 2 SITEWORK

PART 1 - GENERAL

1.1 DESCRIPTION

.1 This section specifies requirements for demolition of existing structures, salvage of materials and disposal of debris.

1.2 JOB CONDITIONS

.1 On-site burning will not be permitted.

.2 Do not use explosives for demolition unless their use is specified.

PART 2 - PRODUCTS

2.1 NOT APPLICABLE

PART 3 - EXECUTION

3.1 PREPARATION

.1 Schedule all work in such a manner as not to remove items that are a necessary part of the operational function of the existing system before the replacement part of the system is operational.

.2 Before commencing the work of this section, verify with the Engineer all objects to be removed and all objects to be preserved.

3.2 DEMOLITION AND ABANDONMENT

.1 Demolish and remove all objects designated. Hidden or buried items which are to be abandoned may be left in place, with the approval of the Engineer, provided all connections to these items are properly capped, plugged or disconnected.

3.3 REMOVAL OF DEBRIS

.1 All debris is to be removed from the site and disposed of at a site obtained by the Contractor and approved by the Engineer. Salvageable items, as designated by the Engineer, are to be deposited in the Owner's storage yard or other location as prescribed by the Owner.

3.4 PROTECTION

.1 Use all means necessary to protect existing objects designated to remain and, in the event of damage, make all repairs and replacements necessary at no change in the Contract Price.

END OF SECTION 02050

PART 1 - GENERAL

This Section specifies requirements for road excavation, road drainage excavation, borrow excavation, embankment construction, and disposal of material in accordance with specification and conforming to lines, grades, dimensions, and typical cross sections shown on plans or established by Engineer.

1.1 RELATED WORK

.1 Section 02050 - Demolition

.2 Section 02231 – Granular Road Base

.3 Section 02713 – Water Main and Appurtenances

.4 Section 02714 – Hot-Mix Asphaltic Concrete Paving

1.2 DEFINITIONS

.1 Topsoil Stripping: Excavation and stockpiling of material capable of supporting good vegetative growth and suitable for use in top dressing, landscaping, and seeding.

.2 Common Excavation: Excavation, placement, and compaction in embankments of all on-site material whatever nature, which are not included under the definition of topsoil stripping, waste excavation, borrow excavation or rock excavation, including dense tills, hardpan, frozen materials, and partially cemented materials which can be ripped and excavated with heavy construction equipment.

.3 Waste Excavation: Excavation and removal from site or disposed on-site as designated by Engineer of any material unsuitable for use in work or surplus to requirements.

.4 Rock Excavation: Rock excavation shall be paid for when the material encountered consists of mass or bedrock or a boulder of volume greater than 0.75 cubic meters. Such rock excavation is divided into two categories; (A) and (B), contingent upon its hardness and difficulty experienced in excavation. It shall be the Contractor's responsibility to demonstrate, to the Engineer's satisfaction that the material cannot be removed or that difficulty is being experienced through excavation by conventional means. In doing so, the Contractor may be required by the Engineer to seek and explore planes of weakness or layers that may ease the excavation process. Frozen material is not classified as rock.

a) Type 'A' Rock

Type 'A' Rock refers to materials, such as fractured sandstone, shale or ledge rock, which can be removed by a backhoe for the depth of excavation. For open excavation, it refers to materials, which, in the opinion of the Engineer, result in:

- Substantial delay or decrease in the normal rate of excavation using conventional equipment.

- Significant damage or wear to the excavating equipment.

b) Type 'B' Rock

Type 'B' Rock requires drilling, blasting, wedging or jackhammering to remove, as determined by the Engineer.

.5 Borrow Excavation: Excavation, delivery to site, placement and compaction of suitable material obtained off-site and used in embankment.

.6 Unsuitable Subgrade: Material at design subgrade level not suitable for pavement structure subgrade, shall be removed as directed by Engineer and replaced with suitable material.

.7 Embankment: Material placed above original ground or in stripped or undercut areas up to subgrade elevation.

.8 Pavement Structure: Combination of layers of unbound or stabilized granular subbase, base, and asphalt or concrete surfacing.

.9 Subgrade Elevation: Elevation immediately below pavement structure.

.10 Subgrade Preparation: Shaping, scarifying, conditioning, blading and compacting of subgrade.

1.3 REQUIREMENTS OF REGULATORY AGENCIES

.1 Adhere to municipal, provincial, and national codes if blasting is required.

1.4 TRAFFIC PROVISIONS

.1 Provide and maintain roadways, walkways, and detours, for vehicular and pedestrian traffic as directed by Engineer.

1.5 PROTECTION

.1 Existing Surface Features

a) Protect existing buildings, trees and other plants, lawns, fencing, service poles, wires, or paving located within right of way or adjoining properties from damage while work is in progress. Repair to Engineer's satisfaction any damage, which may occur.

.2 Trees and Shrubs

a) Where excavation necessitates root or branch cutting do so only under direct control of the Engineer.

b) Protect existing trees and shrubs in accordance with Section 02050.

1.6 SAFETY REQUIREMENTS

.1 Adhere to Municipal and Provincial requirements relating to safety of trenching work, including shoring and bracing as required.

.2 Adhere to all crossing permit (railway, pipeline, telecommunications duct, etc.) requirements.

.3 Provide barricades, flares, etc. to adequately denote area of excavation adjacent to roadways.

.4 Steel interlocking fencing with a minimum height of 6 ft will be required to completely surround all open excavations.

1.7 REFERENCE STANDARDS

.1 Refer to ASTM Sieve Analyses and ASTM Tests for specifications for aggregates and soils.

.2 Other materials are specified with reference to CGSB Standards, CSA Standards, ASTM Standards and AASHO Standards.

1.8 SUBMITTALS

.1 At least 2 weeks before beginning work the Contractor shall submit to the Engineer for review, a complete and detailed outline of the procedures and methods that he/she will employ for this section of the Work.

.2 The Contractor shall not begin work until the Engineer has reviewed the submittal.

1.9 PRODUCT DELIVERY, STORAGE AND HANDLING

.1 Deliver materials to the site and store in a manner such that granular materials are kept in separate piles and manufactured materials are stored according to the recommendations of the manufacturer.

1.10 JOB CONDITIONS AND REGULATIONS

.1 Perform work under observation of Regulations of the Occupational Health and Safety Act of Alberta.

.2 Perform work in a manner that will cause the least disruption to traffic.

.3 The Contractor is responsible for posting of warning and traffic signs; supply and placing of barricades and protective hoarding.

1.11 QUALITY ASSURANCE

.1 Refer to Section 01400 Quality Control.

.2 Submit to the Engineer a list of sources of materials including sand, gravel, borrow materials and concrete aggregates.

.3 Provide samples, test results, sieve analyses and reports for preliminary approval of materials.

.4 Preliminary approval of materials does not constitute general acceptance. Acceptance depends upon satisfactory field test results and performance in place.

.5 Submit to the Engineer for review:

a) concrete mix design

b) certified laboratory analysis for each shipment of asphalt cement.

c) copies of results of aggregate tests for each class of aggregate, including:

i) Los Angeles Abrasion Test (ASTM C131-81)
ii) Crushed fragments
iii) Specific Gravity and Absorption (ASTM C127/C128)
iv) Material Passing 75 micro-m sieve (ASTM C117)

.6 The Contractor shall pay for and submit a design mix based on the Standard Marshall Test Procedure (ASTM D1559).

1.12 MINIMUM QUALITY CONTROL TEST FREQUENCIES

.1 Refer to Section 01400 - Quality Control.

.2 The following frequencies of testing are the minimum required. The Contractor shall perform as many tests as are necessary to ensure that the work conforms to the requirements of the Contract regardless of the minimum number specified.

.3 Provide moisture/density curves for each type of material from each source of material to be compacted to a specified density.

.4 Field densities:

a) Embankments (from excavated material) - one for each 4000 m^2 of compacted layers.

b) Pipe Bedding - one for each 100 m of pipe installed.

c) Pipe Zone Backfill - one for each 100 m of pipe installed.

d) Trench Backfill - one for every 100 m of trench of 1.0 metres fill depth.

e) Subgrade Preparation - one field density for every 2000 m^2 of 150 mm compacted layers.

f) Road Sub-base and Base course - one field density for every 500 m^2 of sub-base and one field density for every 500 m^2 of base course.

.5 Field Tests for Asphaltic Concrete Surface Course

a) Asphalt mixtures

i) daily analysis of density and air voids
ii) daily asphalt content determination

b) Field Testing of in place asphalt

i) density determination and air voids at least once each day and one test for every 1000 m^2 of each layer.
ii) nuclear density determinations at the rate of one test for every 200 m^2 of each layer.
iii) final curing and analysis tests at the rate of one test for every 4000 m^2 of pavement in place.

1.13 DISPOSAL

.1 All materials on site whether stockpiled, stored or excavated are the property of the Owner, and the Owner reserves the right to keep any part or all of the material.

.2 The Contractor shall dispose of debris, waste, unsuitable material, rock or excess material in accordance with the Contract Specification.

.3 Disposal sites will be designated by the Engineer.

.4 The Contractor shall dispose of all materials at sites to be located by the Contractor.

.5 In areas shown on the plans or designated by the Engineer for clearing and grubbing, all timber logs, trees, stumps, brush and other rubbish must be disposed of as follows:

a) Pile and burn in accordance with the permit and prevailing local regulations, if the regulations permit burning.

b) Remove all waste material from the site and dispose of in accordance with Article 1.9.3.

.6 Pile and burn only in areas designated by the Engineer.

1.14 MEASUREMENT FOR PAYMENT

.1 Excavated materials to be measured and paid for in cubic metres for in situ cut. Volumes will be calculated by the Engineer. Unit price bid shall be full compensation for all work necessary for excavating the specified material and execution as described in Clause 3 - Execution of this Section.

.2 Volume excavated from solid rock masses to be calculated from cross-sections of original rock surface and design grade line for excavation. Measurement for boulders and rock fragments exceeding 0.75 m^3 in volume to be determined from three mutually perpendicular dimensions.

.3 Subgrade preparation to be measured in square metres for the area of subgrade prepared beneath pavement, curbs and sidewalks.

.4 Removal of unsuitable subgrade material and replacement with pit run gravel backfill material to be measured in cubic metres for the volume of material removed and the volume of pit run gravel material supplied and placed as described in Clause 3 Execution of this Section.

.5 No measurement will be made for:

a) Unnecessary excavation beyond lines established.

b) Extra handling of windrowed materials blended on embankment slopes.

c) Moisture adjustment of material.

d) Construction, maintenance and restoration of haul routes.

e) Subgrade preparation where unsuitable subgrade is removed and replaced with granular material.

f) Subgrade preparation in areas having fills greater than 300 mm.

PART 2 - PRODUCTS

2.1 GRANULAR MATERIALS

.1 Granular Fill shall comply with the following gradation.

Sieve Size	Percent Passing
75 mm	95 - 100
25 mm	50 - 90
4.75 mm	20 - 60
425 micro m	5 - 35
75 micro m	0 - 5

.2 Granular Foundation shall comply with the following gradation.

Sieve Size	Percent Passing
50 mm	100
4.75 mm	20 - 40
75 micro m	0 - 15

.3 Sand shall comply with the following gradation.

Sieve Size	Percent Passing
9.5 mm	100
4.75 mm	90 - 100
150 micro m	20 max.

.4 Base Course Gravel shall comply with the following gradation.

Sieve Size	Percent Passing
25 mm	100
19 mm	95 - 100
9.5 mm	60 - 80
4.75 mm	40 - 60
2.00 mm	25 - 45
425 micro m	10 - 25
75 micro m	2 - 10

.5 Sub-Base Course Gravel shall comply with the following gradation.

Sieve Size	Percent Passing
75 mm	95 - 100
25 mm	50 - 90
4.75 mm	20 - 60
425 micro m	5 - 35
75 micro m	0 - 5

.6 Filter Gravel shall comply with the following gradation.

Sieve Size	Percent Passing
19.0 mm	100
12.5 mm	95 - 100
4.75 mm	60 - 80
1.18 mm	30 - 60
425 micro m	15 - 30
150 micro m	0 - 10

.7 The combined aggregates for asphalt surface course shall comply with the following gradation.

Sieve Size	Percent Passing
12.50 mm	100
9.50 mm	78 - 94
4.75 mm	58 - 80
2.36 mm	52 - 74
2.00 mm	42 - 64
1.18 mm	28 - 48
425 micro m	19 - 38
150 micro m	10 - 24
75 micro m	5 - 14

A minimum of 70% of the material retained on the 4.75 mm sieve shall have a minimum of 2 crushed faces.

2.2 COMMON BORROW

.1 Common borrow material is obtained from areas off-site.

.2 Common borrow materials shall be sandy or silty clay material of medium plasticity, sand or pit-run gravel from borrow pits. Common borrow shall be free from topsoil, organic material, large rock or debris.

2.3 CLAY BORROW

.1 Clay shall have a minimum plasticity index of 15 and a maximum of 30% retained on a 75 micro m sieve.

.2 Clay borrow shall be free from topsoil, sand, organic material or debris.

2.4 TOPSOIL

.1 Topsoil shall be loose friable soil, free from subsoil, slag, clay, stones, lumps, live plant roots or other unsuitable materials.

.2 Topsoil shall be free from weeds, weed seeds and shall be in a reasonably moist condition.

.3 Topsoil shall be capable of sustaining vigorous plant growth.

2.5 FILTER CLOTH

.1 Non-woven polyester in accordance with CGSB-148.1, 175 g/m^2, 1.7 mm thickness, Nilex 4545 or approved equivalent alternative.

2.6 CEMENT

.1 Type 50 sulfate resistant cement with concrete supplied in accordance with Contract Specifications in Section 03300, Cast-in-Place Concrete.

2.7 GRASS SEED

.1 Use Canada No. 1 seed supplied from a recognized seed house.

.2 Seed mixture:

50% - Kentucky Blue Grass
45% - Creeping Red Fescue
5% - Norlea Perennial Rye

.3 Seed Rate - 2.5 kg per 100 m^2.

2.8 FERTILIZER

.1 Standard commercial fertilizer of the following grade.

Ammonia	11%
Phosphate	48%
Sulfate	0%

.2 Application rate - 3.5 kg per 100 m^2.

2.9 SOD

.1 Use No. 1 Nursery sod supplied by a local sod farm.

.2 Sod shall be permeated with roots, uniform in texture and shall have 50% Kentucky Blue Grass content.

2.10 BITUMINOUS PRIMER

.1 MC-0 or MC-30 as approved by the Engineer.

2.11 ASPHALT CEMENT

.1 Uniform in character, delivered between 135°C and 177°C.

.2 Use grade AC 5.

2.12 RIPRAP

.1 Use Class 1 Nominal Size 300 mm hand placed rock riprap.

.2 Riprap shall be:

100% smaller than 450 mm or 136 kg
20% larger than 350 mm or 68 kg
50% larger than 300 mm or 36 kg
80% larger than 200 mm or 11 kg

2.13 CULVERT

.1 Corrugated Steel Pipe in accordance with CSA G401.

.2 Round, Plain Galvanized, Corrugations 68 x 13 mm.

.3 Diameter -

.4 Wall Thickness -

.5 Couplings - Hugger Band type c/w O-Ring Gaskets.

PART 3 - EXECUTION

3.1 SITE PREPARATION

.1 Clearing

a) Cut, remove and dispose of all timber, brush, windfall, stumps and rubbish except such trees and shrubs as are designated for preservation.

b) Trim branches from timber and salvage usable timber. Salvaged timber shall be the property of the Contractor.

c) Dispose of branches and debris in accordance with Article 1.9 - Disposal.

d) Excavate, remove and dispose of roots, stumps, logs.

.2 Demolition

a) Demolish and remove from the site all objects designated for removal as well as any obstructions, fences or debris. Salvageable items, as designated by the Engineer, are to be deposited in the Owner's storage yard or other location as prescribed by the Owner.

b) Items which are hidden or buried, shall be removed if they are in the way of the structure or trenches. Structures and underground pipes which are not in the way, but are to be abandoned, may be left in place and capped or plugged.

.3 Stripping

a) Strip the site to the limits shown on the drawings, or strip those areas specified or ordered in writing.

b) Strip all areas to be excavated for structures, pipes or roadways.

c) Strip the full depth of topsoil or organic material.

d) Stockpile topsoil temporarily and dispose of stripped material that is not suitable as topsoil.

e) Disposal of unsuitable material shall be in accordance with Article 1.9 - Disposal.

.4 Stockpiling

a) Prepare space around the site for stockpiling excavated material and borrow materials.

3.2 EXCAVATION

.1 All excavation, whether in trenches or excavation for structures is classified as either rock excavation or common excavation.

.2 Common excavation is excavation of all materials, whatever their nature, which are not defined as rock. Common excavation includes dense till, hardpan, frozen materials, partially cemented materials or any other materials which can be ripped and excavated with heavy construction equipment.

.3 Rock

a) Rock is either single boulders, pieces of concrete or masonry with a volume in excess of 0.25 m^3 or any material that cannot be removed by a tracked machine, having a bucket capacity of 0.95 to 1.15 m^3, and which requires for its removal, drilling and blasting or breaking up with a power operated hand tool.

b) No soft or disintegrated rock which can be removed with a hand pick; no material which can be ripped with a crawler tractor having a rated horsepower of 200 to 249; no loose or previously blasted rock or broken stone and no rock exterior to the minimum limits for measurement allowed, which may fall into the excavation will be measured or allowed.

c) Frozen material is not classified as rock.

.4 Temporary work, cofferdams, shoring and bracing

a) Provide all equipment and material to construct temporary works as required including sheeting, timbering, shoring and bracing.

.5 Dewatering

a) It is the responsibility of the Contractor to remove water from trenches and excavations, regardless of origin.

b) Provide pumps and other equipment and materials necessary to keep excavations free of water while work is in progress.

c) Equipment used for dewatering shall be of a suitable and rugged type to ensure continuous operation.

d) Make provision as necessary to prevent floatation or damage to the work in case of accidental stoppage of de-watering equipment.

e) Protect excavations against flooding and damage due to surface run-off.

f) Dispose of the water away from the Work in a manner such that there is no damage to the Work or other property or persons.

.6 Excavate and remove all materials to the depths and dimensions necessary for the construction of the structure and/or pipe to the limits shown on the drawings.

.7 Stockpile excavated materials suitable for backfill in designated locations.

.8 Dispose of unsuitable excavated materials in accordance with Article 1.9 - Disposal.

.9 Excavate for structures and pipes allowing sufficient space to construct structures, lay pipes and to compact backfill.

.10 Minimize disturbance to supporting soil.

.11 Excavate to a depth greater than shown on the drawings, where soil is unsuitable for foundation and the Engineer orders such changes in elevations and dimensions.

.12 Fill with 15.0 MPa compressive strength concrete, any over-excavation carried out in error or carried out without prior approval of the Engineer.

.13 Remove debris and trim excavations. If material at the bottom of the excavation has been disturbed, compact to a density equal to undisturbed soil.

.14 Inspection

a) Notify the Engineer for inspection after the excavation is completed.

b) Do not place any material on the soil until the Engineer has viewed the depth of excavation and the character of the foundation material.

.15 Granular Base

a) Place granular materials in accordance with details on the drawings, and compact to 100% of the maximum density as determined by the Standard Proctor Compaction Test.

b) Place bedding sand in trenches in accordance with the Specifications for Underground Piping.

3.3 UNDERGROUND PIPING

.1 Underground pipe material and installation is specified in Section 02713 – Water Main and Appurtenances. Installation of the pipe includes backfilling in the pipe zone to 300 mm over the top of the pipe.

3.4 UNDERDRAINS

.1 Excavate trenches for underdrain lines under base slabs.

.2 Place 100 mm layer of filter gravel the full width of the trench and compact to 95% of the maximum density as determined by the Standard Proctor Compaction Test.

.3 Lay drains on a prepared bed with inverts smooth and perforations down.

.4 Make joints in accordance with the manufacturer's recommendations.

.5 Surround the pipe with filter material and compact to 95% of the maximum density as determined by the Standard Proctor Compaction Test.

3.5 BACKFILL

.1 Do not proceed with backfill until the Engineer has inspected the work in place.

.2 Use only backfill materials meeting the Contract Specifications.

.3 Backfill cannot commence until concrete has sufficient strength to withstand earth and compaction pressures.

.4 Do not use frozen backfill.

.5 Foundation Backfill

a) Place filter cloth as shown on the drawings and cap and seal to ensure a continuous filter.

b) Place granular filter gravel above the cloth carefully and compact.

c) Install perforated pipe drains, jointed in accordance with manufacturers recommendations.

d) Surround the drain pipe with filter cloth then place and compact gravel to a width of at least 250 mm on each side of the pipe and 200 mm over the pipe.

.6 Trench Backfill

a) Place backfill in a dry trench and roll backfill material down a slope or lower by machine.

b) Where pit run gravel or sand (Class 1) backfill is required, place the backfill material in uniform lifts and compact to 95% of the maximum density as determined by the Standard Proctor Compaction Test.

c) Where compacted native material can be used (Class 2) place the material in uniform lifts and compact to 95% of the maximum density as determined by the Standard Proctor Compaction Test.

d) Control moisture content by adding water or drying the material, at the Contractor's expense.

e) Bring the compacted backfill material up to the subgrade elevation of roads; or the bottom of topsoil.

.7 Backfill for structures

a) Backfill evenly around structures to minimize unbalanced lateral earth pressure.

b) Where granular material is required, place pit-run gravel or sand in layers not more than 200 mm in thickness and compact to 95% of the maximum density as determined by the Standard Proctor Compaction Test.

c) Where compacted native material can be used, place material in layers not more than 200 mm thick and compact to 95% of the maximum density as determined by the Standard Proctor Compaction Test.

d) Control moisture content of the backfill material by adding water or drying the material, at the Contractor's expense.

e) Keep heavy equipment at least 1.5 m away from structures.

3.6 EMBANKMENTS AND GRADING

.1 Place all fills and embankments to elevations, contours and slopes shown on the drawings.

.2 Compaction shall be as specified in Article 3.5 - Backfill.

.3 Grade the top layer to a smooth regular surface.

.4 If there is insufficient suitable material from excavation, supply and place common fill and compact as specified in Article 3.5 - Backfill.

.5 If there are surplus materials after backfilling and embankments and grading are complete, remove surplus materials from the site.

.6 Grade the site as necessary for grassed areas, gravelled areas, parking lots, roadways, sidewalks and curbs and gutters.

3.7 DRAINAGE

.1 Grade the site as shown on the drawings to provide drainage.

.2 Install culverts on a uniform foundation of gravel 150 mm thick.

.3 Backfill as for trenches using compacted granular material as specified in Article 3.5 - Backfill.

.4 Hand place riprap on the ends of culverts.

3.8 TOPSOIL AND SEEDING

.1 Scarify the surface lightly before placing topsoil.

.2 Load, haul and place topsoil to provide a compacted thickness of 150 mm.

.3 Place peat moss, if ordered, and mix thoroughly throughout the topsoil.

.4 Place fertilizer at the rate of 3.5 kg per 100 m^2 and mix thoroughly throughout the topsoil.

.5 Grade and level to a uniform grade and rake the surface free from lumps of soil, stones or other materials.

.6 Sow seed, mechanically at the rate of 2.5 kg per 100 m^2.

.7 Lay sod uniformly and tightly to produce a smooth surface.

.8 Water newly seeded areas and new sod to prevent drying out.

.9 Control weeds using herbicides applied at manufacturer’s recommended rates.

.10 Mow grass at regular intervals to maintain grass at a height of 50 mm.

.11 Provide and maintain barricades and warning signs for all seeded areas, until acceptance.

3.9 SIDEWALK, CURB AND GUTTER

.1 Place a 50 mm sand cushion under concrete areas and compact to 95% of the maximum density as determined by the Standard Proctor Compaction Test.

.2 Use forms in conformance with the Contract Specifications for Section 03100 - Concrete Formwork.

.3 Obtain the approval of the Engineer before placing concrete.

.4 Place concrete in forms and consolidate; in conformance with the Contract Specifications for Section 03300 - Cast-in-Place Concrete.

.5 Place expansion joints adjacent to other structures and form 6 mm deep contraction joints and 13 mm deep surface joints every other 1.5 m.

.6 Finish shall be broom finished with 50 mm tooled edges.

.7 Apply curing compound when forms are removed.

.8 Backfill all around concrete.

3.10 ROADWAYS AND PARKING AREAS

.1 Scarify and shape the subgrade and compact the top 150 mm to 100% of the maximum density as determined by the Standard Proctor Compaction Test.

.2 Obtain the Engineer's approval before laying sub-base or base course.

.3 Place granular sub-base and base course to the thickness shown on the drawings. Place in layers not exceeding 150 mm in compacted thickness and compact at optimum moisture content to 100% of the maximum dry density as determined by the Standard Proctor Compaction Test.

.4 Place prime coat when temperature is lower than 10°C, at a rate of 2.0 L per m^2.

.5 Use a mixing plant approved by the Engineer, meeting ASTM D995 which can produce a mixture conforming to the design mix and the job mix.

.6 Deliver hot mix at a temperature within 10°C of the specified temperature.

.7 Ambient air temperature shall be 5°C or greater at the time of placing asphalt.

.8 Breakdown roll using approved equipment and follow immediately with steel wheeled rollers.

END OF SECTION 02217

PART 1 - GENERAL

This section specifies the requirements for granular sub-base and base course for roadways and parking areas. The work includes:

.1 Supply of granular materials.

.2 Placing and compacting sub-base.

.3 Placing and compacting base course.

1.1 RELATED WORK

.1 Section 01400 – Quality Control

.2 Section 01900 – Permanent and Temporary Environmental Protection Devices

.3 Section 02217 – Roadway Excavation, Compaction, and Backfill

.4 Section 02741 – Hot-Mix Asphaltic Concrete Paving

1.2 MAINTENANCE OF TRAFFIC

.1 Perform work in a manner that will cause the least disruption to traffic.

.2 Closing of streets, detouring of traffic, posting of traffic signs and provision of flagmen shall be the Contractor's responsibility.

.3 Maintain detour roads.

1.3 PERMITS

.1 Obtain all permits required for this section of the work and abide by the stipulations of the permits.

1.4 QUALITY CONTROL TESTING

.1 Refer to Section 01400 - Quality Control.

.2 Moisture density curves to ASTM D698.

.3 Sieve analyses to ASTM C136.

.4 Field densities to ASTM D2167 or to ASTM D2922.

.5 The Owner may retain the services of a material testing firm to carry out quality control tests as follows The Contractor shall perform as many additional tests as

are necessary to ensure that the Work conforms to the requirements of the Contract regardless of the number of tests performed by the Owner.

1.5 MEASUREMENT FOR PAYMENT

.1 Subgrade Preparation

(a) Subgrade preparation shall be measured in square metres based on compacted subgrade to the thickness specified.

(b) Subgrade preparation shall include scarifying the subgrade to the thickness specified, spreading, shaping, adding water or drying, rolling and compacting to the specified density.

.2 Granular Sub-base

(a) Sub-base to be measured in square metres of compacted material incorporated into work in accordance with design.

(b) Unit price bid shall be full compensation for all work involved in supplying and installing as described in Clause 3 - Execution of this Section.

.3 Granular Base

(a) Granular base to be measured in square metres of compacted material for the depth specified and incorporated into work in accordance with design.

(b) Unit price bid shall be full compensation for all work involved in supplying granular base and installing as described in Clause 3 – Execution of this Section.

.4 Reshape Existing Roadway

(a) Granular base to be measured in square metres of reshaped roadway.

(b) Reshape Existing Roadway shall include shaping, spreading, grading, compaction to specified density, removal and disposal of unsuitable material and hauling off site as required. Reshaping shall also include cleanup, finishing, removal of debris, trimming and all incidental work.

(c) Unit price bid shall be full compensation for all work involved in reshaping the existing gravel roadway.

PART 2 - PRODUCTS

2.1 GRANULAR SUB-BASE

.1 Consists of sound, hard, durable, uniformly graded pit run or crushed gravel or sand as specified.

2.2 GRANULAR BASE

.1 Consists of sound, hard, durable particles of gravel, stone, sand and fine soil particles crushed to a uniform gradation and to the maximum size designated.

2.3 GRANULAR SUB-BASE AND GRANULAR BASE

.1 Shall not contain sod, roots, plants or other organic materials, nor shall they contain soft fragments such as shale or flaky particles in excess of fifteen (15%) percent by weight. The materials shall be well graded from course to fine within the gradation limits and shall not be subject to extreme variation between the lower and upper limits of the gradation band specified.

.2 Of the prepared materials, that portion of fine aggregate including supplementary material, shall have a Liquid Limit of not more than 25 and a Plasticity Index of not more than 6.

2.4 GRADATION DESIGNATIONS

When tested on Standard Laboratory screens the materials shall meet one or more of the following:

.1 Sand shall comply with the following gradation.

Sieve Size	Percent Passing
5 mm	90 - 100
1.25 mm	55 - 85
0.315 mm	10 - 35
0.080 mm	0 - 5

.2 Pit Run Gravel shall comply with the following gradation.

Sieve Size	Percent Passing	
	75 mm	150mm
150 mm		100
80 mm	100	80 - 100
50 mm	80 - 100	
25 mm	50 - 75	50 - 80
5 mm	25 - 55	25 - 55
0.080 mm	2 - 10	2 - 10

.3 Crushed Gravel shall comply with the following gradation.

Sieve Size	Percent Passing	
	16 mm	20 mm
20 mm		100
16 mm	100	84 - 94
12.5 mm	89 - 100	
10 mm	78 - 94	63 - 86
5 mm	55 - 70	40 - 67
2.5 mm	33 - 54	
1.25 mm	25 - 45	20 - 43
0.63 mm	18 - 38	14 - 34
0.315 mm	12 - 30	9 - 26
0.160 mm	8 - 20	5 - 18
0.080 mm	4 - 10	2 - 10

For crushed gravel, not less than 60 % of the material retained on the 5 mm sieve shall be crushed particles. The ratio of the percentage passing the 0.080mm sieve shall not exceed two-thirds and preferably not less than one-half the percentage passing the 0.50mm sieve.

PART 3 - EXECUTION

3.1 SUB-GRADE PREPARATION

.1 The sub-grade shall be shaped to the cross-section shown on the plans prior to placing the sub-base course. The Contractor shall maintain the sub-grade to the specified compaction and section, free from ruts, waves and undulations, by whatever means are necessary.

.2 The sub-grade or sub-base course shall be in a firm dry condition before any material is placed thereon and the Engineer's consent must be obtained before placing any granular material.

3.2 PLACING OF SUB-BASE AND BASE COURSE

.1 Unless otherwise specified, the granular material shall be placed in uniform layers not exceeding 150 mm in thickness before compaction. The material shall be placed by mechanical spreaders or deposited in windrows and levelled with a suitable motor grader.

3.3 COMPACTION OF SUB-BASE AND BASE COURSE

.1 The granular sub-base and base course material shall be compacted by rolling with a pneumatic-tired roller, vibratory roller or other approved type. Each layer

shall be compacted at the optimum moisture content, to 100 % of the maximum dry density as determined by the Standard Proctor Compaction Test for the material used.

.2 During compaction, water shall be added by an applicator in such quantities that the moisture content will be maintained at the optimum level as determined by the Standard Proctor test. If the moisture content exceeds the optimum moisture content, the material shall be aerated by mechanical means or work shall cease temporarily until the material has dried sufficiently to reach the optimum moisture content.

3.4 SHAPING OF SUB-BASE AND BASE COURSE

.1 A blade grader shall be used in conjunction with the compaction equipment to keep the finished surface of each layer even and uniform. The finished surfaces of the granular base course and sub-base course shall conform to the required cross-section and grades as shown on the drawings and as staked by the Engineer, within a tolerance of plus or minus 15 mm. The finished sub-base course surface shall show no depression more than 13 mm under a straight edge of 3 m long placed parallel to the road center line. The finished base course surface shall show no depression more than 6 mm under a straight edge 3 m long placed parallel to the road centerline.

3.5 PROOF ROLLING

.1 If requested by the Engineer, the Contractor shall supply and operate a loaded test vehicle of 8,200 kg axle load to test the sub-base and base for rutting and weaving.

.2 Where proof rolling indicates areas that are defective, remove and replace according to this specification at the Contractor's expense.

END OF SECTION 02231

PART 1 - GENERAL

This section specifies requirements for cast-in-place and extruded concrete sidewalks, curbs, gutters, walkways and swales.

.1 Cast-in-place Concrete

(a) Preparation of subgrade

(b) Supply and placing of fills and cushion materials

(c) Supply of materials for casting in place separate sidewalks, monolithic sidewalks curbs and gutter, curbs and gutters and concrete drainage swales.

(d) Finishing, curing and backfilling.

.2 Extruded Concrete

(a) Subgrade cutting and preparation

(b) Placing Concrete

(c) Finishing

(d) Backfilling

1.1 RELATED SECTIONS

.1 Section 01400 – Quality Control

.2 Section 01900 – Permanent and Temporary Environmental Protection Devices

.3 Section 02050 - Demolition

.4 Section 02217 – Roadway Excavation, Compaction, and Backfill

.5 Section 02231 – Granular Road Base

.6 Section 02713 – Water Main and Appurtenances

.7 Section 02741 – Hot-Mix Asphaltic Concrete Paving

.8 Section 02745 – Asphalt Prime and Tack Coat

1.2 QUALITY ASSURANCE

.1 Refer to Section 01400 - Quality Control.

.2 Submit a concrete mix design to the Engineer for review.

1.3 QUALITY TESTING

.1 The Owner may retain the services of a materials testing firm to carry out field quality tests as follows:

(a) All procedures outlined in Section 01400 - Quality Control.

(b) Moisture density curves, as per ASTM-D698.

(c) Sieve analysis, as per ASTM-C136.

(d) Field densities, as per ASTM-D21674 or ASTM-D2922.

(e) Concrete testing, as per CSA A23.3.

.2 Minimum quality control test frequencies specified as follows are the tests that will be performed by the Owner. The Contractor shall perform as many tests as are necessary to ensure that the Work conforms to the requirements of the Contract regardless of the minimum number required.

(a) Cast 3 concrete test cylinders for each compressive strength test on cylinder for the 7 day test and 2 for the 28 day test for every 30 m^3 of concrete. Minimum of one concrete test per day.

(b) Air content tests – one test with each set of cylinders.

(c) Slump tests – one test with each set of cylinders.

1.4 DISPOSAL

.1 All materials on site whether stockpiled, stored or excavated are the property of the Owner and the Owner reserves the right to keep any part or all of the material.

.2 The Contractor shall dispose of debris, waste, unsuitable materials, rejected work, broken concrete or excess material in accordance with the Specifications.

.3 Disposal sites will be designated by the Engineer.

.4 The Contractor shall dispose of all materials at sites to be located by the Contractor.

1.5 MEASUREMENT FOR PAYMENT

.1 Remove Existing Concrete

Waste concrete is to be disposed by the contractor and shall include the cost to cut, demolish, transport, load, unload, and dispose material. The Contractor shall only remove concrete as directed by the Engineer.

Removal of asphalt as required to enable installation of the new concrete curb and gutter and monolithic sidewalk is considered incidental to the bid item. This asphalt removal shall include the cost to cut, demolish, load, transport, unload, and dispose material. The Contractor shall make efforts to minimize the total volume of asphalt removal required for the construction of the new curb. The Contractor shall only remove asphalt or as directed by the Engineer.

(a) Monolithic curb, gutter and sidewalk shall be measured in lineal metres along the line of the face of curb.

(b) Separate sidewalk shall be measured in square metres. Separate sidewalk will be measured along the centerline of the walk.

(c) Separate curb and gutter shall be measured in lineal metres along the line of the face of curb.

(d) Medians shall be measured in lineal metres along the centerline of the median, from end cap to end cap.

(e) Concrete swales shall be measured in lineal metres along the centerline of the swale.

(f) Pararamps shall be measured in square metres, measured along the centerline of of the walk.

.2 Sidewalks, Walkways, Curb and Gutter, Median Caps, Swales

Sidewalk, walkways, curb, gutters and swales shall include excavation or fill to prepare subgrade, preparation of base or cushion, formwork, supply and placing of concrete, jointing, reinforcing, finishing, curing, sealing and backfilling. Also included is special finishing required to build paraplegic ramps (pararamps) or other features for which separate payment is not specified elsewhere.

The Contractor shall backfill the gap between the existing roadway and the new gutter as specified in Article 3.3.4, or other materials approved by the Engineer. Grinding and/or overlay to the existing adjacent asphalt will be required as directed by the Engineer. These works are considered incidental to this bid item for which separate payment is not specified elsewhere.

(a) Monolithic curb, gutter and sidewalk shall be measured in lineal metres along the line of the face of curb.

(b) Separate sidewalk shall be measured in square metres. Separate sidewalk will be measured along the centerline of the walk.

(c) Separate curb and gutter shall be measured in lineal metres along the line of the face of curb.

(d) Medians shall be measured in lineal metres along the centerline of the median, from end cap to end cap.

(e) Concrete swales shall be measured in lineal metres along the centerline of the swale.

.3 Pararamps

Pararamps shall be measured in square metres, measured along the centerline of of the walk.

Pararamps shall include excavation or fill to prepare subgrade, preparation of base or cushion, formwork, supply and placing concrete, jointing, reinforcing, finishing, curing, sealing and backfilling.

.4 Reinforced Lane Crossings (Driveway Crossings)

Reinforced Lane crossings shall be measured in linear metres.

Reinforced Lane crossing shall include extra reinforcing and cast in place concrete.

PART 2 - PRODUCTS

2.1 SAND CUSHION

.1 Cushion material shall consist of sand, crusher screenings or other approved material meeting the following requirements:

Sieve Size	Percent Passing
20 mm	100
5 mm	20 - 60
0.080 mm	2 - 20

2.2 CONCRETE

.1 As per CSA A23.1/A23.2.

.2 Concrete mix shall be in accordance with the following:

Minimum 28 Day Strength	Designated Size of Aggregate	Slump	Air Entrainment	Water Cement Ratio
30 MPa	20 mm maximum	60 mm	5-7%	0.45 maximum

.3 Cement shall be Type 50 - Sulphate Resistant Cement.

2.3 REINFORCEMENT

.1 Wire mesh - P35 x P35 - 150/150 - welded wire fabric.

.2 Reinforcing bars - 10 M deformed bars to meet CSA G30.18.

2.4 FILL MATERIALS

.1 Pit run gravel shall be maximum size 75 mm complying with the following gradation:

Sieve Size	Percent Passing
80 mm	100
50 mm	80 - 100
25 mm	50 - 75
5 mm	25 - 55
0.080 mm	2 - 10

2.5 CURING COMPOUND

.1 Curing compound to ASTM-C309 TYPE 1-D Class B.

2.6 SEALING SOLUTION

.1 Mixture of 50% boiled linseed oil and 50% kerosene or varsol.

PART 3 - EXECUTION

3.1 REMOVAL OF EXISTING STRUCTURES

.1 Remove existing curbs, gutters, sidewalks and other structures shown on the drawings to be removed.

.2 Cut existing concrete neatly, load and haul debris to designated disposal areas in accordance with Article 1.5 - Disposal.

3.2 EXCAVATION

.1 Excavate materials to the required grade, elevations and cross-sections as shown on the drawings.

.2 Remove all deleterious substances encountered at the subgrade level and replace with approved fill material, compacted to 100% of maximum density as determined by the Standard Proctor Compaction Test, to provide a uniform bearing over the area of the structure.

.3 If the subgrade is excavated in error, below the specified grade, replace with approved fill material compacted to 100% of maximum density as determined by the Standard Proctor Compaction Test, at the Contractor's expense.

.4 Load, haul and dispose of excavated material that is unsuitable for use as fill, or surplus excavated material in accordance with Article 1.6 - Disposal.

3.3 FILL

.1 Areas to be filled shall be stripped of topsoil and graded uniformly before fill is placed.

.2 Fill material shall be approved fill material, either pit run gravel or common fill.

.3 Spread fill material in 150 mm layers and compact to 100% of maximum density as determined by the Standard Proctor Compaction Test.

.4 Gap between existing road and new gutter to be filled with 30 MPa Concrete from compacted granular base and 50mm Asphalt cap to the standard in section 02741.

3.4 SUBGRADE COMPACTION

.1 Cast-in Place

(a) Scarify, shape and compact the subgrade to a minimum of 100% of maximum density as determined by the Standard Proctor Compaction Test.

(b) Total Compacted Thickness - 150 mm.

.2 Extruded

(a) Scarify, shape and compact the subgrade to a minimum of 100% of maximum density as determined by the Standard Proctor Compaction Test.

(b) Equipment used to cut subgrade shall be capable of producing a clean smooth surface. Depth of loose material remaining on the subgrade shall not exceed 13 mm.

3.5 CUSHION

.1 The Engineer shall inspect the condition of the subgrade before cushion material is placed.

.2 Place the cushion material with a maximum of 50 mm compacted thickness.

.3 Compact cushion to 100% of maximum density as determined by the Standard Proctor Compaction Test.

3.6 FORMING

.1 Use straight, smooth and clean metal or timber forms oiled with Parvelube #30 or approved alternative.

.2 Place forms to line and grade, then brace and stake firmly in place.

.3 Use wooden forms or other approved equivalent for curved surfaces with radii less than 46 m.

3.7 EXTRUDING

.1 Extruded curb shall be constructed with a 12:1 sloped face.

3.8 ADJUSTMENT

.1 Adjust elevations of manholes, valves, catch basins and other structures to suit final grades and wrap metal surfaces to be cast in concrete with a layer of plastic.

3.9 INSPECTION

.1 Inspect the subgrade and cushion to ensure that the base has not been softened by moisture and to ensure that the base is not too dry for placing concrete.

.2 Delay placing concrete as required to dry the base if the base is too wet or add moisture as necessary to prevent absorption of water from concrete if the base is too dry.

.3 The Engineer shall inspect the base before concrete is placed.

.4 Provide the Engineer with templates in accordance with the cross sections on the drawings to enable the Engineer to inspect cross sections.

3.10 COLD WEATHER REQUIREMENTS

.1 Do not place concrete when air temperature is below 4°C, unless the following requirements are met:

(a) Preheat water and aggregates as well as reinforcing, forms and the ground.

(b) When temperature in the shade is 2°C and indications are that the temperature will fall, cover the concrete and maintain an adequate air cushion at 10°C. If forced air heating is used add moisture. Keep the air cushion heated for 72 hours and keep the protection for 96 hours.

.2 Do not use calcium chloride, except with the written permission of the Engineer and then only with normal portland cement and in quantities less than 2% by

weight. Close control of calcium chloride quantities and careful mixing are required.

3.11 PLACING CAST-IN-PLACE CONCRETE

.1 Place concrete in forms and consolidate in the forms using mechanical vibrators.

.2 Vibrate sidewalks and rolled face monolithic sidewalks with a vibrating screed approved by the Engineer.

.3 Vibrate curb and gutter sections with a poker type vibrator not exceeding 50 mm in diameter.

3.12 PLACING CONCRETE USING EXTRUSION EQUIPMENT

.1 Use extrusion equipment with automatic grade and line control. Submit details regarding equipment to the Engineer for written approval.

.2 Operation of the extrusion machines shall be continuous until a section or scheduled pour is completed.

.3 The interval between successive loadings of the concrete hopper shall not exceed 30 minutes.

.4 If operations are delayed or stopped, construct a construction joint containing one 10 M reinforcing bar for every 0.3 m width of the structure. Bars shall extend 0.6 m each way from the joint. Do not reuse the excess concrete.

.5 Vibrate to insure a dense smooth concrete, free of honeycombing.

3.13 CONTRACTION JOINTS AND SURFACE JOINTS

.1 Form 6 mm wide and 50 mm deep contraction joints and 13 mm deep surface joints in sidewalks every other 1.5 m as detailed on the drawings.

.2 Provide 3 mm wide contraction joints in curb and gutter every 3 m by placing a steel plate in the forms and withdrawing the plate after concrete has attained its initial set.

.3 Provide 3 mm wide surface joints longitudinally between sidewalk and curb.

3.14 FINISHING

.1 Work the concrete surface with a wood float and brush with a stiff brush or broom to provide an even surface.

.2 Avoid excessive troweling.

.3 If there is excessive water, delay finishing until excess water has evaporated.

.4 Remove surplus water from brushes before brushing.

.5 Tool all edges 50 mm wide with rounded edges.

3.15 PROTECTION

.1 Supply and place tarpaulins and other materials necessary to protect the work from weather.

.2 Supply and sprinkle water as necessary to control dust.

.3 Barricade the work as necessary to prevent damage to the work and leave in place for at least 7 days.

3.16 STRIPPING FORMS

.1 Remove forms carefully after initial set and repair damaged surfaces immediately.

3.17 CURING

.1 Apply curing compound immediately after forms are removed.

.2 Apply curing compound uniformly with an approved pressurized spray.

3.18 SEALING

.1 Apply sealing solution if ordered by the Engineer.

.2 Concrete surfaces must be clean and dry.

.3 Make the first application of sealing compound between 3 to 7 days after the time that the concrete is poured.

.4 Apply the second coat immediately after the first coat has been absorbed and appears dry.

.5 Coverage - First coat 8.6 m^2 per litre.

- Second coat 12 m^2 per litre.

.6 Apply uniformly with an approved pressurized spray.

3.19 NAME PLATE

.1 Once in each block place the imprint of the name plate showing the name of the Contractor and the year of construction.

3.20 BACKFILLING

.1 Backfill material is common fill.

.2 Commence backfilling within 10 days, but not sooner than 7 days from the day the concrete was finished.

.3 The area between the edge of the concrete work and the surrounding ground shall be backfilled.

.4 If the top of the concrete is below the elevation of the surrounding ground, backfill to the full height of the concrete section and back slope at 1:3 slope, excavating as necessary.

.5 If the top of the concrete is above the elevation of the surrounding ground, backfill to the full height of the concrete and back slope at 1:3 to the level of existing ground.

.6 If road construction does not immediately follow curb and gutter construction, fill in front of the gutter as specified in Articles 3.3.4.

.7 Where landscaping by other Contractors or the Owner follows the work of this contract, leave backfill 150 mm low to allow for topsoil.

.8 Where this contract includes curb and gutter and sidewalks, the Contractor shall grade the area between the curb and gutter and the sidewalk, cutting excess material and filling in where required.

3.21 CLEANUP

.1 Remove all debris and excess materials from the site immediately after completion of the work in accordance with Article 1.6 - Disposal.

.2 Cleanup operations shall be carried on continuously as the work progresses.

END OF SECTION 02528

PART 1 - GENERAL

This section specifies requirements for pressure pipe for watermains, water supply mains and sewage forcemains. The work includes:

.1 Supply of pipe and jointing materials

.2 Supply of fittings, valves and hydrants

.3 Installation, disinfection and testing

1.2 QUALITY ASSURANCE

.1 Materials supplied in this section are in accordance with AWWA, ASTM and CSA standards.

.2 The Engineer may at any time require the Contractor to produce certification by an independent testing agency that materials used conform to the specified standards, and the costs of such certifications shall be borne by the Contractor.

.3 Testing laboratories or agencies to test materials shall be independent testing agencies approved by the Engineer.

.4 Hydrostatic testing is specified in Part 3 Execution.

1.3 SUBMITTALS

.1 Submit shop drawings in accordance with Section 01300 - Submittals.

1.4 PRODUCT DELIVERY, STORAGE AND HANDLING

.1 Pipe and accessory materials shall be unloaded and stored at the site by the Contractor, with care to prevent damage.

.2 Store materials so that they are kept clean.

.3 Drain valves and hydrants to eliminate damage due to freezing of trapped water.

.4 Store pipe in accordance with the manufacturer's recommendations.

1.5 REGULATIONS

.1 The Standards and Guidelines for Municipal Water Supply, Wastewater and Storm Drainage Facilities, issued by Standards and Approvals Division, Alberta Environment shall apply to the work of this section.

1.6 QUALITY CONTROL TESTING

.1 Refer to Section 01400 Quality Control.

.2 Moisture density curves: to ASTM-D698.

.3 Sieve analyses: to ASTM-C136.

.4 Field densities: to ASTM-D2167 or to ASTM-D2922.

.5 The Owner may retain the services of a material testing firm to carry out quality control tests. The Contractor shall perform as many additional tests as are necessary to ensure that the work conforms to the requirements of the Contract regardless of the number of tests performed by the Owner.

1.7 MEASUREMENT FOR PAYMENT

.1 Supply and Installation of Pressure Pipe

Supply and Installation of Pressure Pipe shall include;

(a) Supply of pipe, including purchase, loading, transporting and unloading;
(b) Installing pipe, including pipe laying and jointing;
(c) Supplying and placing pipe bedding material;
(d) Backfilling in the pipe zone;
(e) Cleaning;
(f) Testing; and
(g) All incidental work for which payment is not specified elsewhere.

The Supply and Installation of Pressure Pipe shall be measured along the horizontal centerline and grade of the pipe from center to center of fittings or from outside walls of vaults, valve chambers or structures.

The Supply and Installation of Pressure Pipe shall include the purchase, loading, transporting, unloading, and installing of pipe including supply and placing of pipe bedding, laying, jointing, backfilling in the pipe zone, thrust blocks, cleaning, testing and all incidental work for which payment is not specified elsewhere.

.2 Hydrants, Valve Chambers, Valves and Fittings

Hydrant, valve chamber, valve or fitting shall be measured in units supplied and installed.

Valve chambers, valves and fittings shall include supply of materials, excavation, installation, including thrust blocks, temporary supports, testing, disinfecting and

backfilling, and all incidental work for which separate payment is not specified elsewhere.

Hydrant installation shall include supply and installation of a new hydrant, lead pipe from hydrant to main and valve assembly including required excavation, supply and installation of all vertical piping required, hydrant drain, concrete pad, temporary supports, adjustments to final grade, testing, backfill, and all incidental work for which separate payment is not specified elsewhere.

.3 Wet Connections (Live Tap)

Wet Connections shall be measured in units of wet connection completed and tested.

Wet connections (live taps) shall include the additional work and materials required to make a connection in the water distribution system to an existing system in service. The unit price includes excavation, location of existing pipes, cutting pipes, installing fittings, dewatering, backfilling and restoration of surfaces.

.4 Replacement Material for Unsuitable Subgrade

Payment for supply and placement of screened rock bedding material according to this Section for unsuitable pipe foundation will be made at the unit price tendered per cubic metre. Unit price to include excavation of unsuitable foundation material and replaced with screened rock

PART 2 - PRODUCTS

2.1 PIPE

.1 Polyethylene Pipe (P.E.)

(a) To CGSB-41-GP-25M - Pipe, Polyethylene for the transport of liquids

(b) To CSA-B137.0 - General Requirements and Methods of Testing for Thermoplastic Pipe

(c) To CSA-B137.1 - Polyethylene Plastic Pipe (SDR-PR) based on Controlled Outside Diameter

(d) To ASTM-D1248 - Polyethylene Plastic Molding and Extrusion Materials

(e) To ASTM-D2837 - Long Term Strength

(f) To ASTM-F714 - Polyethylene (PE) Plastic Pipe (SDR-PR) Based on Outside Diameter

(g) Raw material designation ASTM D1248 Type III, Class C, Category 5, Grade P34

(h) Pipe designation CGSB-41-GP-25M - PE3408 - Type 3, Category 5, Design Basis 10 MPa

(i) Pipe series DR 21

(j) Pipe joint - thermal butt fusion

(k) Typical Properties: as per ASTM

Property	Test Method	Unit	Value
Density	D1505	gms/cc	0.957
Melt Index	D1238	dg/min	0.25
Environmental Stress Cracking	D1693 (Cond. C)	h/F20	192 min
Resistance Tensile Strength	D638M	psi	3500
Yield	2" min		
Elongation at Break	2" min	%	600 min
Brittleness Temp.	D746	°C	70
Hardness	D2240	Shore D	62
Coefficient of Linear Thermal Expansion	D696	mm/mm°C	1.62x10-4

.2 Polyvinyl Chloride (PVC) manufactured to AWWA-C900 and certified to CSA-B137.3.

(a) Rubber gasket joints ASTM-D3139

(b) Materials - Type 1 Grade 1 ASTM-D1784

(c) Class Designation 12454A or 12454B

(d) Pressure Rating 1035 kPa DR18

(e) Designated for potable water use.

2.2 FITTINGS

.1 Polyethylene

(a) Flanges to AWWA-C207 - flanged with steel backing flange

(b) Fittings shall be to match the pipe supplied and shall be supplied by the manufacturer of the pipe or by suppliers approved by the pipe manufacturer

(c) Fittings to be compatible in materials and dimensions, with the pipe

.2 PVC

(a) Cast iron rubber gasket type - AWWA-C110/A21.10

(b) Class 150 PVC fittings conforming to AWWA-C900 and certified under CSA B137.3, pressure rating to match pipe.

2.3 VALVES

.1 Gate Valves - AWWA-C500

(a) 1,200 kPa cold water service

(b) Non-rising, stem - 50 mm square operating nut

(c) Bronze mounted, solid wedge or double disc type

(d) Valve connections to match the type of pipe

(e) Turns to open - counterclockwise

.2 Valve Box and Extension

(a) Adjustable to 3 m of bury

(b) Screw type or sliding type

(c) Cast iron - asphaltic coated

(d) Extension stem 25 mm square mild steel with 50 mm square operating nut and flange

2.4 COUPLINGS - PLAIN AND TRANSITION

.1 Rings and end plates - enamel coated ductile iron or nylon coated steel

.2 Rubber gaskets

.3 Chrome plated or corrosion resistant alloy bolts

.4 Dresser, Robar or approved equivalent alternative

2.5 HYDRANTS

.1 AWWA-C502

.2 Compression type closing with pressure

.3 Iron body, bronze mounted with O-ring seals at operating nut

.4 Minimum opening 115 m diameter

.5 Barrel I.D. - 150 mm minimum

.6 Depth of trench 2.9 m

.7 One 100 mm pumper nozzle and two 65 mm hose connections to conform with Alberta Mutual Aid Thread Standard and to match existing hydrants in the Owner's system

.8 Flanged at ground line with 150 mm bottom inlet connection to match the type of watermain

.9 Bottom connection with drip valve and drain

.10 Operating nut - three sided or to match existing hydrants in the Owner's system

.11 Turn to open - Counterclockwise

2.6 CONCRETE

.1 Compressive strength 30 MPa at 28 days sulphate resistant Class 50 - CSA-A23.1.

2.7 PIPE BEDDING

.1 Sand, complying with the following gradation.

Sieve Size	Percent Passing
10 mm	100
5 mm	90 - 100
0.630 mm	52 - 100
0.080	0 - 13

.2 Gravel, complying with the following gradation.

Sieve Size	Percent Passing
20 mm	100
16 mm	84 - 94
10 mm	63 - 86
5 mm	40 - 67
1.25 mm	20 - 43
0.630 mm	14 - 34
0.350 mm	9 - 26
0.160 mm	5 - 18
0.080 mm	2 - 10

.3 Screened rock - 40 mm maximum size with maximum 5% passing the 5 mm sieve.

2.8 BACKFILL IN THE PIPE ZONE

.1 Sand complying with the following gradation.

Sieve Size	Percent Passing
10 mm	100
5 mm	90 - 100
0.630 mm	52 - 100
0.080	0 - 13

.2 Selected native soil shall be material selected from the excavated trench materials by the Contractor. Selected native soil shall be well graded and shall not contain particles larger than 25 mm. It shall be free of frozen material and shall not contain organic material in quantities that may harm the installation.

2.9 SCREENED ROCK TO REPLACE UNSUITABLE SUBGRADE

.1 Screened rock - 40 mm maximum size with maximum 5% passing the 5 mm sieve.

PART 3 - EXECUTION

3.1 UNLOADING, STORING, HAULING, STRINGING

.1 Unloading, stockpiling, loading, hauling and stringing shall be done in such a manner as to prevent damage to pipe, lining, coating, fittings, valves, hydrants and other materials.

.2 Use only equipment approved by the Engineer.

.3 Where necessary, protect material from exposure to sunlight or from any condition that may harm pipe, linings or coatings. Handle PVC pipe in cold weather in accordance with the manufacturer's recommendations.

.4 String pipe without interfering with access for construction operations, landowner and tenants.

3.2 TRENCH INSPECTION

.1 Check trench bottom for stability and notify the Engineer.

.2 Remove unstable soil and replace with compacted pit run gravel or washed rock if ordered by the Engineer in writing.

3.3 INSPECTION OF PIPE AND ACCESSORIES

.1 Inspect for defects immediately before lowering into the trench.

.2 Clean pipes, fittings and valves before installation.

3.4 ALIGNMENT AND GRADE

.1 Lay pipe to the required alignment and grade, with fittings, valves, hydrants and all other appurtenances at their required locations.

.2 Provide 2.75 m minimum depth of cover on the pipe.

.3 Erect batterboards or sight rails over the trench at intervals of not more than 30 m to provide control, or provide control by laser beam in a manner approved by the Engineer.

.4 Acceptable tolerances are as follows:

(a) Alignment - the centreline of the pipe shall not be more than 150 mm off the given line.

(b) Elevation - the pipe invert shall not be more than 50 mm off the given elevation.

.5 No deviation shall be made from the required line or grade without the written consent of the Engineer.

3.5 TRENCH WIDTHS

.1 Widths of trenches shall be such that pipes can be laid and jointed properly and backfill placed and compacted properly.

.2 Trench walls shall be vertical to 300 mm above the top of the pipe and the width at this location shall not exceed the maximum.

.3 Trench Width - Single Pipe

(a) Minimum - nominal pipe diameter plus 400 mm

(b) Maximum - nominal pipe diameter plus 600 mm

3.6 PIPE BEDDING

.1 Prepare the pipe bedding in accordance with the drawings and the following specifications.

.2 Class A - concrete bedding placed the full width of the trench to the depth shown on the drawings.

.3 Class B - Sand or approved gravel bedding material placed the full width of the trench and compacted to 95% of the maximum density as determined by the Standard Proctor Compaction Test.

.4 Class C - removal of rocks and debris from the trench bottom and shaping the trench bottom to provide support throughout the length of the pipe.

.5 Provide bell or coupling holes and support the pipe uniformly and continuously throughout its length.

3.7 BACKFILLING IN THE PIPE ZONE

.1 The pipe zone is defined as that part of the trench from the pipe bedding to 300 mm above the top of the pipe, or above the top of the highest pipe in a combined trench.

.2 Backfilling in the pipe zone shall be in accordance with the drawings and the following specifications:

(a) Class A - backfill with sand meeting the specifications, uniformly in the trench, at both sides of the pipe for the full width of the trench. Compact in layers to 95% of the maximum density as determined by the Standard Proctor Compaction Test until the compacted sand is 300 mm over the top of the pipe. Compact under and around pipe joints.

(b) Class B - Backfill with sand or with selected native soil deposited uniformly in the trench at both sides of the pipe for the full width of the trench. Compact in layers to 95% of the maximum density as determined by the Standard Proctor Compaction Test, until the compacted backfill is 300 mm above the top of the pipe. Compact under and around pipe joints.

(c) Class C - backfill with sand or selected native soil deposited uniformly in the trench at both sides of the pipe for the full width of the trench. Compact in layers to 90% of the maximum density as determined by the Standard Proctor Compaction Test, until the compacted backfill is 300 mm above the top of the pipe. Compact under and around pipe joints.

(d) Frozen material shall not be used for backfill in the pipe zone.

3.8 LOWERING PIPE AND ACCESSORIES INTO TRENCH

.1 Use implements, tools and facilities satisfactory to the Engineer, and use care to prevent damage to pipe and material. Do not drop pipe or materials into the trench.

.2 Cover pipe ends if necessary to keep clean.

3.9 PIPELAYING – GENERAL

.1 Lay pipes with the bell ends facing in the direction of the laying operations.

.2 Cut pipes where necessary to install fittings and valves. Make cuts in accordance with the manufacturer's recommendations using recommended cutting tools and cut pipes squarely and accurately.

.3 Pipe deflections at joint shall not exceed those specified by the pipe manufacturer.

.4 Do not lay pipe in water or when, in the opinion of the Engineer, trench conditions are unsuitable.

.5 Cover open ends of installed pipe, when piping laying is not in progress to keep out trench water.

.6 Heat gaskets as necessary for pipelaying in cold weather conditions.

3.10 LAYING POLYETHYLENE PIPE

.1 Pipe joints shall be made in accordance with the manufacturer's recommendations.

.2 Square the end of each pipe section to be fused using the facing tool of the fusion machine or approved pipe cutters.

.3 Remove cuttings and burrs from the pipe.

.4 Line up pipes in the fusion machine to ensure that pipe ends meet squarely and completely over the entire surface to be fused. Misalignment shall not exceed one-tenth of the wall thickness of the pipe.

.5 Check the pressure due to friction before each joint is made, using procedures provided by the manufacturer of the pipe.

.6 Clean the pipe ends.

.7 Check temperatures and insert the heater plate in the jointing machine between the pipe ends.

.8 Move the pipe ends against the heater plate and apply the required hydraulic pressure ensuring that the gauge reading includes the recommended heating pressure and the pressure due to friction.

.9 Maintain a constant pressure for formation of a continuous small bead of 3 mm diameter around the pipe.

Constant pressure shall be maintained for the time intervals:

Average wall thickness up to and including 15 mm	15 seconds
Above 15 mm	25 seconds

.10 Remove pressure, open the machine, remove the heater plate and close the machine.

.11 Apply the required hydraulic pressure ensuring that the gauge reading includes both the recommended fusion pressure plus the pressure due to friction.

.12 Maintain constant pressure until the surface of the fusion bead is cool to the touch.

.13 Remove pressure and move the fused joint through the machine.

.14 Lower the pipe into the prepared pipe bedding, and backfill in the pipe zone immediately.

3.11 LAYING PVC PIPE

.1 Clean the bell and spigot ends of the pipes.

.2 Insert the rubber ring with care so that the ring is in the correct position and is seated evenly around the pipe.

.3 Do not lubricate the rubber ring.

.4 Lubricate the spigot end, covering the bevelled end and the entire circumference of the pipe, using a brush, cloth, hand, sponge or glove. Apply a minimum amount of lubricant.

.5 Insert the spigot end into the bell so that it is in contact with the ring. Push the spigot end in until the reference mark on the spigot end is flush with the end of the bell, using a bar and a block or other approved equipment.

.6 Cut pipes with a fine tooth hack saw to make a square cut and bevel the ends using a bevelling tool. Locate the reference mark the proper distance from the bevel end.

.7 Lay PVC pipe in accordance with the recommendations of the manufacturer of the pipe.

3.12 LENGTH OF PIPE AT FITTINGS AND RIGID STRUCTURES

.1 Use 1000 mm maximum pipe lengths where 200 mm or smaller diameter rigid watermains connect to valves, hydrants or structures.

.2 Use 2000 mm maximum pipe lengths where 250 mm or larger diameter rigid watermains connect to valves, hydrants or

.3 At least one flexible joint shall be used between two adjacent rigid joints.

3.13 JOINTING PIPE TO FITTINGS

.1 Connect pipes to fittings using rubber gasket or mechanical joints.

.2 Where dissimilar pipes are connected or where rubber gasket or mechanical joints cannot be made to connect use sleeve type couplings or flanged connections.

.3 Where plastic pipe is connected to butterfly valves use a short length of steel pipe on each side of the valve and adapt to the plastic pipe using couplings.

3.14 FLOATING PIPE

.1 Place adequate backfill to prevent floating of pipes.

.2 Remove and relay any pipes which have floated.

3.15 SETTING FITTINGS AND VALVES

.1 Install fittings and valves at the required locations.

.2 Install valve boxes plumb and support valve boxes to prevent the transmission of strain or shock to the valve.

.3 Set valve boxes flush with finished grades.

.4 Use galvanized metal harness where required.

3.16 SETTING HYDRANTS

.1 Install hydrants in the required locations and at the required directions.

.2 Set hydrants plumb with hose nozzles parallel or at right angles to the street centerline.

.3 Set hydrants with ground flanges above final curb and sidewalk grades.

.4 Provide gravel filter where hydrant barrels can be drained to the surrounding soil. Plug hydrant drains where ordered by the Engineer.

.5 Construct hydrant thrust blocks so that drains are not plugged.

3.17 PLUGGING OF DEAD ENDS

.1 Insert standard plugs into the bell ends of fittings or pipe bells. Place caps over spigot ends of fittings and pipes.

.2 Construct concrete thrust blocks for all caps and plugs as detailed on drawings.

3.18 THRUST RESTRAINT AND ANCHORAGE

.1 Thrust restraint is required at changes in directions as at tees, bends and crosses; at changes in size; at stops; and at valves and hydrants.

.2 Valves shall be anchored as follows:

Size of Valve

Working Pressure	Requiring Anchor
Up to 700 kPa	300 mm and up
700 kPa to 1000 kPa	200 mm and up
1000 kPa to 1380 kPa	all sizes

.3 Anchor valves as detailed on the drawings.

.4 Place concrete thrust blocks against solid ground with a minimum bearing area as shown on the drawings or as requested by the Engineer.

.5 Use concrete with a minimum compressive strength of 25 MPa.

.6 Pour the concrete in a manner that will leave pipes and fittings accessible for repair.

.7 Where solid backing is not available, provide galvanized tie rods and galvanized pipe clamps in lieu of reaction blocks.

.8 Anchor pipes on slopes in accordance with details shown on the drawings.

3.19 HYDROSTATIC TESTING - GENERAL

.1 The Contractor shall supply all testing equipment and personnel to perform hydrostatic tests.

.2 Personnel shall be qualified to operate testing equipment and testing equipment shall be approved by the Engineer. Test pumps shall be motor driven and shall be complete with pressure gauges.

.3 The Contractor shall advise the Engineer 24 hours in advance of filling the line for testing.

.4 Testing shall be in accordance with regulations of the Occupational Health and Safety Act and in accordance with Alberta Environment regulations.

.5 Testing shall not be done under winter conditions unless the line can be safely drained or immediately placed in operation.

3.20 LEAKAGE TEST

.1 Leakage tests shall be performed on all pressure pipe systems, including service connections, after backfilling is complete.

.2 Test in sections not exceeding 365 m of main, or obtain the approval of the Engineer to test larger sections.

.3 Test procedures are similar for all types of pipe installed, however leakage allowances shall be in accordance with the specified allowance for each type of pipe.

.4 Fill the system with water and expel air. If necessary install temporary taps to expel air and plug these after testing is complete.

.5 Apply test pressure by means of a test pump equipped with a measurable volume container acceptable to the Engineer.

.6 Test pressures shall be:

(a) Polyvinyl Chloride pipe - 1.50 times the operating pressure at the lowest part of the system or the rated pressure class of the pipe, whichever is less.

(b) Polyethylene pipe - 1.50 times the rated pressure of the pipe or two times the operating pressure, whichever is less.

(c) Do not vary test pressures more than 5 psi.

(d) Do not apply test pressures in excess of two times the rated pressure of gate valves and hydrants.

(e) Do not apply test pressures in excess of the rated pressure of butterfly valves.

.7 Maintain test pressures for a duration of two hours.

.8 Repair and test until leakage is within the specified limits.

3.21 LEAKAGE ALLOWANCES

.1 Allowable leakage will be determined by the Engineer using the formula

$$L = \frac{NDP}{128{,}300}$$

where L = allowable leakage in litres per hour

N = number of joints in the test section

D = nominal pipe diameter in millimeters

P = square root of the test pressure in kPa

.2 The number of joints is estimated from the total length of pipe installed plus 1 joint allowance for each water service connection.

.3 An additional allowance is made when testing against closed metal seated valves. This allowance is 0.0012 litres per hour for each millimetre if nominal valve size.

3.22 LEAKAGE ALLOWANCES POLYETHYLENE PIPE, STEEL PIPE

.1 No leakage is allowed for a fused polyethylene joint.

.2 The number of joints in the test section shall be counted as 1 joint for each service connection and 1 joint for each flanged joint in the section.

.3 Allowable leakage will be determined by the Engineer using the formula

$$L = \frac{NDP}{128{,}300}$$

where L = allowable leakage in litres per hour

N = number of joints in the test section

D = nominal pipe diameter in millimeters

P = square root of the test pressure in kPa

.4 An additional allowance is made when testing against closed, metal seated valves. This allowance is 0.0012 litres per hour for each millimetre of nominal valve size.

3.23 FLUSHING

.1 Flush watermains clean of all dirt.

3.24 DISINFECTION

.1 Chlorinate watermains in accordance with AWWA-C651 - Standard for Disinfecting Watermains Using Calcium Hypochlorite (H.T.H. 70).

.2 Attach H.T.H. tablets to the top inside of each piece of pipe using Le Page's white waterproof glue.

.3 Number of tablets per pipe shall be:

150 mm diameter pipe - 1 per 4 m of pipe

200 mm diameter pipe - 2 per 4 m of pipe

250 mm diameter pipe - 3 per 4 m of pipe

300 mm diameter pipe - 5 per 4 m of pipe

350 mm diameter pipe - 6 per 4 m of pipe

.4 In larger sizes of pipe provide H.T.H. in sufficient quantities to dose the water with 50 ppm of chlorine for 12 hours.

.5 After 12 hours, the chlorine residual shall be more than 20 ppm.

.6 Flush watermains and safely discharge the water so that no downstream damage occurs.

.7 Disinfection may be carried out simultaneously with testing provided the provisions of AWWA-C651 are followed.

.8 If repairs are made on any section of pipe, disinfection shall be repeated.

.9 Tests for chlorine residuals and bacteriological samples and tests will be taken by the Engineer.

3.25 OPERATION

.1 Check the operation of all valves and hydrants in the presence of the Engineer.

.2 Mark locations of valves and other underground appurtenances with 50 mm x 100 mm stakes 0.9 m long driven 0.6 m into the ground at the property line opposite the valve. Marker stakes shall be painted red.

END OF SECTION 02713

PART 1 - GENERAL

This Section specifies requirements for producing and placing hot-mix asphalt concrete including supply of aggregates and bituminous binder.

1.1 RELATED WORK

.1 Section 02217 – Roadway Excavation, Compaction and Backfill

.2 Section 02231 – Granular Road Base

.3 Section 02745 – Asphalt Prime Coat

1.2 DEFINITIONS

.1 Table A, appended to this Section, lists general uses for each type of asphaltic concrete mixtures based on asphaltic concrete aggregate gradation sizes specified under Section 02231.

1.3 MEASUREMENT FOR PAYMENT

.1 Asphalt concrete paving to be measured in square metres.

.2 Asphalt levelling course to be measured in tonnes.

.3 Unit price bid shall be full compensation for all work involved in supplying asphaltic concrete and installing as described in Clause 3 - Execution of this Section.

.4 Payment will be subject to the Unit Price Adjustments for density and thickness as defined in Section 2.

PART 2 - PRODUCTS

2.1 ASPHALT CEMENT

.1 Asphalt cement to penetration grade 150 - 200 A to CGSB-16.3 and possess the properties as shown in Table B appended to this Section.

.2 Provide approved storage, heating tanks, and pumping facilities for asphalt cement.

2.2 AGGREGATES

.1 Asphaltic concrete aggregate shall be crushed gravel. Gradation shall be in accordance with Section 02231 – Granular Road Base for the Asphaltic Concrete Mix Type specified in the Schedule of Quantities, and as specified herein. Maximum permissible gradation variation as per Table C appended to this Section.

.2 Sand equivalent: ASTM D2419 (AASHTO T176), minimum 50%. One test per mix design.

.3 Magnesium Sulphate soundness: ASTM C88 (AASHTO T104) percentage loss by mass, coarse aggregate: 18, fine aggregate 20. One test per aggregate source, or as requested by the Engineer.

.4 Los Angeles Abrasion: ASTM C131 (AASHTO T96), maximum percentage loss by mass, coarse aggregate: 40. One test per aggregate source, or as requested by the Engineer.

.5 Absorption: ASTM C127 (AASHTO T85), maximum percentage by mass, coarse aggregate: 1.75. One test per mix design.

.6 Loss by washing: ASTM C117 (AASHTO T11), maximum percentage passing 80 micron sieve, coarse aggregate: 1.5. One test per mix design.

.7 Lightweight particles: ASTM C123 (AASHTO T150), maximum percentage by mass less than 1.95 relative density: 1.5. One test per mix design.

.8 Flat and elongated particles: (with length to thickness ratio greater than 5), maximum percentage by mass, coarse aggregate: 15. One test per mix design.

.9 Crushed fragments: minimum percentage by mass with minimum of two freshly fractured faces. Retained on 5 mm sieve, coarse aggregate: 60.

.10 Regardless of compliance with specified physical requirements, aggregates may be accepted or rejected on basis of past field performance. One test for each extraction sample.

.11 Stockpile minimum 50% of total amount of aggregate required before commencing asphalt mixing operation.

.12 When dryer drum mixing plant is used, stockpile fine aggregate separately from coarse aggregate.

2.3 MANUFACTURED FINES

.1 Manufactured fines to Section 02231.

.2 Add manufactured fines when necessary to meet job mix aggregate gradation or as directed to improve mix properties.

2.4 MIX DESIGN

.1 Preparation and submission of asphalt mix design for the Engineer's approval is the responsibility of the Contractor. The Contractor shall use professional engineering services and a qualified testing laboratory to assess the aggregate materials proposed for use and to carry out the design of the asphalt mixture. The mix design is to be submitted to the Engineer for approval at least two weeks prior to commencing paving operations.

.2 The asphalt mix design shall follow the Marshall method of Mix Design as outlined in the latest edition of the Asphalt Institute Manual Series No. 2 (MS-2). The Mix Design, at the design Asphalt Content, shall meet the requirements shown in Table D, appended to this Section, for the Asphalt Mix Type specified.

.3 Physical requirements to be measured as follows:

.4 Marshall stability and flow index to ASTM D1559.

.5 Air voids to ASTM D3203.

.6 Voids in mineral aggregate to ASTM C127 and ASTM C128 with allowance for volume of asphalt absorbed in aggregate.

.7 Submit the following with mix design:

.8 Temperature of asphalt during mixing in plant.

.9 Temperature of asphalt immediately prior to compaction.

.10 Do not change mix design without prior written approval of the Engineer.

.11 Should a change in material source be proposed, new mix design must be approved by Engineer.

2.5 FIELD QUALITY TESTING

.1 The Owner may retain the services of a materials testing firm to carry out field quality tests as follows:

(a) Aggregate Gradation: One aggregate gradation test for each 300 tonnes of production, or at least one per day (ASTM C136).

(b) Mix Quality: At least one test of three briquettes for each 1000 tonnes of production, and at least one test per day for each of:

i) Marshall Stability: ASTM D 1559

ii) Specific Gravity: ASTM D 2726

iii) Air Voids and VMA: ASTM D 3203

iv) Flow Index: ASTM D 1559, C29

v) Asphaltic Content Extraction: ASTM D 2172 and
Sieve Analysis ASTM C117, C136

(c) Field Density, Asphalt Thickness, and Asphalt Content: After asphaltic concrete has been laid and compacted, one pavement core from approximately each 1000 m^2 of pavement will be obtained at locations determined by Engineer. Cross sectional depth of core will be measured to determine asphalt thickness. Density of core will be measured and compared with the Marshall density taken from field samples of the asphalt mix placed in the area of the core. Asphalt content will be determined and compared to the recommended asphalt content determined in the asphalt mix design.

.2 If core test results fail to satisfy thickness, density, or asphalt content requirements as specified, Contractor shall immediately modify his construction procedures to produce a uniformly compacted surface which will satisfy density and thickness requirements. Sections with inadequate compaction or thickness shall be subject to a payment reduction as defined under Section 2.6, Section 2.7, and Section 2.8 or rejected, as directed by Engineer.

.3 The core test result will be deemed to represent the approximate 1000 m^2 area from which it was taken depending on location of other cores taken. Boundaries of the area represented by the core test results will be determined by the Engineer.

.4 If initial core is found to be deficient, two additional cores within each deficient area may be taken by an independent qualified testing firm at Contractor's expense, in locations approved by Engineer. In this case, additional core test results will be averaged with first result to represent area in question.

.5 The Contractor shall give written notice to Engineer, 48 hours in advance of any paving operations, to make arrangements for testing.

.6 If test results indicate non-compliance with Specifications, pavement may be rejected by Engineer. Pavement thus rejected shall be removed and replaced at Contractor's expense.

.7 Cost of additional testing made necessary by the Contractor's unsatisfactory workmanship or materials will be charged to Contractor.

.8 The Contractor shall perform all tests necessary to control the quality of his materials and workmanship, and ensure that his work complies with the Specifications, as specified in Section 01400.

2.6 ASPHALT CONCRETE THICKNESS TOLERANCES

.1 For areas deficient in thickness, the Contractor shall overlay or pay penalties to the Town as per policy below:

(a) For areas deficient in thickness by more than 15 mm, overlay or pay penalties for the entire area.

(b) No adjustment in unit price for areas thicker than required.

(c) For areas deficient in thickness by more than 5 mm and less than 15 mm, of the design thickness, the penalties are applicable as per Table E appended to this Section.

2.7 ASPHALT DENSITY TOLERANCES

.1 Each mat of hot-mix asphalt placed shall be compacted to minimum density (percentage of Marshall Density) specified for type of pavement as per Table F appended to this Section.

.2 If asphalt density is found to be deficient according to core tests described under Clause 2.5 of this Section, payment for asphaltic concrete surface course within area represented by core(s) will be reduced. Payment reduction will be equal to unit rate tendered for asphaltic concrete surface course in question, multiplied by payment reduction factor derived from the appropriate payment reduction factor as shown in Table G appended to this Section for the pavement density specified in Table F.

In multi-lift pavements, payment reduction may be applied to individual lifts of pavement; in which case unit price used to calculate payment reduction would be determined by Engineer based on depth of asphaltic lift in proportion to depth of full asphaltic concrete portion of pavement.

.3 No adjustment to the unit price to be made for areas with a density higher than that specified.

2.8 ASPHALT CONTENT

.1 If asphalt content is found to be deficient according to core tests described under Clause 2.5 of this Section, payment for asphalt content within area represented by core(s) will be reduced. Payment reduction will be equal to the unit rate tendered for asphaltic concrete surface course in question, multiplied by the payment

reduction factor derived from the appropriate payment reduction factor as shown in Table H appended to this Section.

In multi-lift pavements, payment reduction may be applied to individual lifts of pavement; in which case unit price used to calculate payment reduction would be determined by the Engineer based on depth of asphaltic lift in proportion to depth of full asphaltic concrete portion of pavement.

2.9 APPLICATION OF REDUCED UNIT PRICE

.1 The application of a reduced unit price pursuant to Clauses 2.6, 2.7, and 2.8 does not relieve the Engineer of his Contract Maintenance requirements.

PART 3 - EXECUTION

3.1 PLANT AND MIXING REQUIREMENTS

.1 Batch and continuous mixing plants to ASTM D995 and Asphalt Institute Manuals.

3.2 EQUIPMENT

.1 Pavers: mechanical self-powered pavers with automatic screed controls, capable of spreading mix within specified tolerances, true to line, grade, and crown indicated.

.2 Rollers: sufficient number of self-propelled rollers of type and weight to obtain specified density of compacted mix.

.3 Haul trucks: of adequate size, speed, and condition to ensure orderly and continuous operation and as follows:

(a) Boxes with tight metal bottoms.

(b) Covers of sufficient size and weight to completely cover and protect asphalt mix when the truck fully loaded.

(c) In cool weather or for long hauls, insulate the entire contact area of each truck box.

.4 Hand tools:

(a) Lutes or rakes with covered teeth during spreading and finishing operations.

(b) Tamping irons having mass not less than 12 kg and a bearing area not exceeding 310 cm^2 for compacting material along curbs and other areas

inaccessible to roller. Mechanical compaction equipment, when approved by the Engineer, may be used instead of tamping irons.

(c) Straight edge, 3.0 m in length, to test finished surface.

3.3 PREPARATION

.1 Written notice of intention to begin paving operations to be given to Engineer 48 hours in advance.

.2 When paving over existing asphalt surface, clean pavement surface in accordance with Section 02217. When levelling course is not required, patch and correct depressions and other irregularities to approval of the Engineer before beginning paving operations.

.3 Apply prime coat or tack coat where directed in accordance with Section 02745 prior to paving.

.4 Prior to laying mix, clean surfaces of loose and foreign material.

.5 Paint contact surfaces of existing structures such as manholes, curbs, or gutters with bituminous material prior to placing adjacent pavement.

.6 Traffic shall not be permitted to travel on tack or prime coat until it has cured. Provide flagmen, if required, to control traffic.

3.4 TRANSPORTATION OF MIX

.1 Transport mix to the job site in vehicles cleaned of foreign material.

.2 Paint or spray truck beds with light oil, limewater, or detergent solution, at least once a day or as required. Elevate the truck bed and thoroughly drain. No excess solution or use of gasoline, kerosene, or similar product will be permitted.

.3 Schedule delivery of the material for placing in daylight, unless the Engineer approves artificial light.

.4 Deliver material to the paver at a uniform rate and in an amount within capacity of paving and compacting equipment.

.5 Deliver loads continuously in covered vehicles and immediately spread and compact. Deliver and place mixes at a temperature between 125°C and 150°C.

3.5 PLACING

.1 Place asphalt concrete to thickness, grades, and lines indicated on Drawings or directed by The Engineer.

.2 Placing conditions:

(a) Place asphalt mixtures only when air temperature is above 5°C.

(b) When the temperature of the surface on which material is to be placed falls below 10°C, provide extra rollers as necessary to obtain required compaction before cooling.

(c) Do not place hot-mix asphalt when pools of standing water exist on the surface to be paved, during rain, or when the surface is damp.

.3 Place asphalt concrete in compacted lifts of 75 mm maximum depth.

.4 Spread and strike-off the mixture with a self-propelled mechanical finisher as follows:

(a) Construct longitudinal joints and edges parallel to line markings. Create lines for paver to follow, parallel to the centerline of proposed pavement. Position and operate the paver to follow established line closely.

(b) When using pavers in echelon, have the first paver follow marks or lines, and the second paver follow the edge of material placed by first paver. Work the pavers as close together as possible and in no case permit them to be more than 30 m apart.

(c) If segregation occurs, immediately suspend the spreading operation until cause is determined and corrected.

(d) Correct irregularities in alignment left by the paver by trimming directly behind machine.

(e) Correct irregularities in the surface of the pavement course directly behind paver. Remove excess material forming high spots, by shovel or lute. Fill and smooth indented areas with hot- mix. Do not broadcast material over such areas.

(f) Do not throw surplus material on freshly screeded surfaces.

.5 When hand spreading is used:

(a) Wood or steel forms, approved and rigidly supported to assure correct grade and cross section, may be used. Use measuring blocks and intermediate strips to aid in obtaining required cross section.

(b) Distribute material uniformly. Do not broadcast material.

(c) During spreading operation, thoroughly loosen and uniformly distribute material by lutes or covered rakes. Reject material that has formed into lumps and does not break down readily.

(d) Following placing and before rolling, check surface with templates and straightedges and correct irregularities.

(e) Provide heating equipment to keep hand tools free from asphalt. Temperature of tools is not to be higher than temperature of mix being placed.

3.6 COMPACTING

.1 Roll asphalt continuously to specified density.

.2 Provide at least two rollers one of which must be pneumatic-tired type, and as many additional rollers as necessary to achieve specified pavement density.

.3 Start rolling operations as soon as the placed mixture can bear weight of roller without undue displacement of the material or cracking of the surface.

.4 Operate the roller slowly on first pass to avoid displacement of material. For subsequent rolling do not exceed 5 km/h for steel-wheeled rollers and 8 km/h for pneumatic-tired rollers.

.5 Overlap successive trips of the roller by at least one half-width of the roller and vary trip lengths.

.6 Keep wheels of roller slightly moistened with water to prevent pick-up of material but do not over-water.

.7 After longitudinal joints and edges have been compacted, start rolling longitudinally at the low side and progress to the high side.

.8 Where rolling causes displacement of material, loosen affected areas at once with lutes or shovels and restore to original grade of loose material before re-rolling.

.9 Do not permit heavy equipment or rollers to stand on the finished surface before it has been compacted and thoroughly cooled.

.10 When paving in echelon, leave 50 to 75 mm unrolled along the edge which the second paver is following and roll after the second paver has passed when the joint between lanes is rolled.

3.7 JOINTS

.1 General

(a) Trim to vertical face to provide true surface and cross section against which new pavement may be laid. Remove loose particles.

(b) Paint joint face with thin coat of hot asphalt cement or preheat joint face with approved heater, prior to placing of fresh mixture.

(c) Overlap previously laid strip with spreader by 100 mm.

(d) Remove surplus material from surface of previously laid strip. Do not dispose on surface of freshly laid strip.

.2 Transverse Joints

(a) Transverse joints between existing pavement and asphaltic concrete pavement placed under this Contract shall be of a vertical butt type, well bonded, sealed, and finished to provide a continuous, smooth profile across the joint. Joint construction is to be as follows:

i) The existing pavement shall be cold milled to expose a vertical surface, of a depth equal to the final lift, against which new pavement may be placed.

ii) In longitudinal section, the minimum slope of the milled area shall be 100 horizontal to 1 vertical.

iii) In plan, the Contractor shall stagger joints by at least 2 m in adjacent mats.

(b) When the existing pavement has been removed in advance of paving the joint area, the Contractor shall construct a smooth taper at the joint area to a slope of at least 20 horizontal to 1 vertical. The taper may be placed on tar paper and shall be removed when paving is resumed. The transverse joint shall be straight and have a vertical face when the taper is removed.

.3 Longitudinal Joints

(a) Before rolling, carefully remove and discard coarse aggregate in material overlapping joint with a lute or rake. Do not rake or discard aggregate material onto freshly screed surfaces.

(b) Roll longitudinal joints directly behind paving operation.

(c) On initial pass, operate roller on previously placed lane such that not more than 150 mm of roller rides on edge of newly laid lane, then operate roller to pinch and press fines gradually across joint. Continue rolling until a thoroughly compacted neat joint is obtained.

(d) Offset longitudinal joints in succeeding lifts by at least 150 mm.

(e) On final lift offset longitudinal joints by at least 150 mm from intended lane markings.

.4 Feather Joints

(f) Construct feather joints so that thinner portion of joint contains fine graded material obtained by changed mix design or by raking out coarse aggregate in mix. Place and compact joint so that joint is smooth and without visible breaks in grade.

3.8 FINISH TOLERANCES

.1 Finished asphalt surface to be within 5 mm of design elevation but not uniformly high or low.

.2 Finished asphalt surface not to have irregularities exceeding 5 mm when checked with a 3.0 m straight edge placed in any direction.

3.9 SURFACE IRREGULARITIES AND DEFECTS

.1 Correct irregularities which develop before completion of rolling by loosening surface mix and removing or adding material as required. If irregularities or defects remain after final compaction, remove surface course promptly and lay new material to form a true and even surface and compact immediately to the specified density.

.2 Repair areas showing checking or hairline cracking.

TABLE A
ASPHALT MIX TYPES

MIX TYPE	USE
5a	Thin Levelling Course Skin Patching
5b(1)	Bottom and Top Lift for Local and Collector Roadways Bottom Lift for Arterial Roadways Lane and Parking Lot Paving Trench Repairs
5b(2)	Overlay (crown) Paving Bottom and Top Lift for Local, Collector, and Arterial Roadways
5c	Bottom and Top Lift for Local and Collector Roadways, and Bottom for Arterial Roadways
5d	Top Lift and Overlay for Arterial Roadways
5e	Bottom Lift for Arterial Roadways

Specific areas of use of each class of asphaltic concrete pavement will be defined on drawings and/or unit price table.

TABLE B
PROPERTIES OF ASPHALT CEMENT FOR ROADS CGSB-16.3

TEST	ASTM TEST METHOD	TEST RESULT
1. Absolute Viscosity at 60° C (Pascals per second)	D 2171	Penetration (150) 78 - 155 (200) 50 - 92
2. Kinematic Viscosity at 135° C (mm^2 per second)	D 2170	Penetration (150) 255 - 360 (200) 205 - 285
3. Penetration at 25° C, 100 gm, 5 second, (dmm)	D 5	150 - 200
4. Ductility of residue at 25° C (minimum cm)	D 113	100
5. Solubility in Trichloroethylene (minimum %)	D 2042	99.5
6. Flash Point - Cleveland Open Cup (°C)	D 92	205
7. Test on residue from thin film oven test (D 1754) ratio of absolute viscosity to original absolute viscosity	D 2171	4.0

TABLE C
AGGREGATE VARIATION LIMITS

SIEVE DESIGNATION (MM)	MAXIMUM PERMISSIBLE VARIATION * PERCENT BY WEIGHT PASSING
5.0	± 5
1.25	± 3
0.630	± 2
0.315	± 2
0.160	± 1.5
0.080	± 1.5

* In any case, the Lot Average Gradation must meet the gradation requirements of Section 02701, Aggregates General.

TABLE D
MIX TYPES AND CHARACTERISTICS

Aggregate Designation, Section 02701 Table A	5a	5b(1)	5b(2)	5c	5d	5e
Aggregate Size	10	12.5	12.5	16	16	20
% Manufactured Fines, -5000 (Minimum)[1]	60	60	70	60	70	60
% Fractures, +5000 (2 Faces) (Minimum)	60	70	90	70	90	70
Asphalt Cement Grade	150 - 200A	150 - 200A	150 - 200A	150 - 200A	150 - 200A	150 - 200A
Minimum Marshall Stability, N	5300	8500	10000	8500	10000	6700
Number of Blows	75	75	75	75	75	75
% Air Voids	3 to 5	3 to 5	3 to 5	3 to 5	3 to 5	3 to 5
VMA % (Minimum) by 3% Air Voids	14	13	13	13	13	12.5
VMA % (Minimum) by 4% Air Voids	15	14	14	14	14	13.5
VMA % (Minimum) by 5% Air Voids	16	15	15	15	15	14.5
Minimum Theoretical Asphalt Film Thickness, (Microns)[2]	7.0	7.0	7.5	7.0	7.5	7.0
Voids filled with Asphalt, %	65 to 78	65 to 75	65 to 75	65 to 75	65 to 75	65 to 75
Flow, mm	2 to 4	2 to 3.5	2 to 3.5	2 to 3.5	2 to 3.5	2 to 3.5
Minimum Retained Stability, %	70	70	70	70	75	70

General Requirements for Mix Design:

1. It is recommended that the Design Asphalt Content be determined at 4% air voids, which is the midpoint of the design air voids. The test properties at this asphalt content are then checked to ensure compliance with the respective criteria.
2. A minimum of four specimens shall be prepared at each asphalt content.
3. Theoretical maximum specific gravity shall be determined in duplicate for a least three asphalt contents.
4. Retained stability after 24 hours soaking at 60°C to be run at the recommended Design Asphalt Content.

1 - The percentage of Manufactured Fines in the -5000 portion of the Combined Aggregate. All fines manufactured by the process of crushing shall be incorporated into the mix for Asphalt Mix Type 5a.

2 - The minimum theoretical film thickness value shall be established in accordance with TLT-311.

TABLE E
PENALTIES FOR PAVEMENT THICKNESS

Thickness Deficiency (mm)	Payment Reduction Factor
0 to 5	0% No Penalty
6 to 9	10% current cost on a 40 mm lift
10 to 12	25% current cost on a 40 mm lift
13 to 15	50% current cost on a 40 mm lift
Over 15	Remove and Replace

TABLE F

SPECIFIED ASPHALT CONCRETE PAVEMENT DENSITY

Type of Pavement	Minimum Density	Penalty
Levelling Course	96%	N/A
Crown Paving Locals and Collectors (Mix 5b and 5c)	96%	B
Crown Paving Arterials (Mix 5d)	97%	A
Bottom lift for local, collector, and arterial roadways	96%	B
Top lift for local, collector, and arterial roadways	97%	A
Paved lanes and parking lots	95%	C
Trench Repairs	95%	C

TABLE G
DEFICIENCY FOR DENSITY

A		B		C	
Specific Density = 97%		**Specific Density = 96%**		**Specific Density = 95%**	
Field Density	**Payment Reduction Factor (%)**	**Field Density**	**Payment Reduction Factor (%)**	**Field Density**	**Payment Reduction Factor (%)**
97.0 to 96.6	0	96.0 to 95.6	0	95.0 to 94.6	0
96.5 to 96.1	3%	95.5 to 95.1	3%	94.5 to 94.1	4%
96.0 to 95.6	7%	95.0 to 94.6	9%	94.9 to 93.6	12%
95.5 to 95.1	14%	94.5 to 94.1	18%	≤ 93.5	Remove and Replace
95.0 to 94.6	24%	≤ 94.0	Remove and Replace		
≤ 94.5	Remove and Replace				

Notes: Applied to actual contract prices or as determined by engineer

TABLE H
UNIT PRICE ADJUSTMENT FOR ASPHALT CONTENT

A. Out of Spec Penalty Per Tonne

Deviation of the Actual Asphalt Content from the Approved Design Asphalt Content (%)	Unit Price Adjustment for Asphalt Content ($ per tonne)			
	Top Lift		Bottom Lift(s)	
	Below	Above	Below	Above
FROM 0 TO 0.30	$0.00	$0.00	$0.00	$0.00
From 0.31 to 0.40	-$2.00	-$1.75	-$2.00	-$1.75
From 0.41 to 0.50	-$4.00	-$3.50	-$4.00	-$3.50
From 0.51 to 0.60			-$6.00	-$5.25
From 0.61 to 0.70			-$8.00	-$7.00

B. Adjustment for Unit Price Per Square Metre

Deviation of the Actual Asphalt Content from the Approved Design Asphalt Content (%)	Unit Price Adjustment for Asphalt Content (%)			
	Top Lift		Bottom Lift(s)	
	Below	Above	Below	Above
FROM 0 TO 0.30	0.00%	0.00%	0.00%	0.00%
From 0.31 to 0.40	-4.00%	-3.50%	-4.00%	-3.50%
From 0.41 to 0.50	-8.00%	-7.00%	-8.00%	-7.00%
From 0.51 to 0.60			-12.00%	-10.50%
From 0.61 to 0.70			-16.00%	-14.00%

Notes:

1. For top lift and asphaltic concrete overlay paving deviations of more than 0.60%, the Contractor shall remove and replace the previously laid mix.

2. For bottom lift(s) deviations of more than 0.70%, no payment will be made and the Engineer will determine whether removal and replacement is necessary.

END OF SECTION 02741

PART 1 - GENERAL

This section includes the specifications for supplying and applying asphalt prime and tack coats.

1.1 Related Sections

.1 Section 02217 – Roadway Excavation, Compaction, and Backfill

.2 Section 02231 – Granular Road Base

.3 Section 02714 – Hot-Mix Asphaltic Concrete Paving

1.2 References

.1 AI (Asphalt Institute) MS-19 – Basic Asphalt Emulsion Manual.

.2 Canadian General Standards Board

(a) GSB 8-GP-2M, April 1, 1988

.3 Standards Council of Canada

(a) CAN2-16.2-75 Asphalts, Emulsified, Anionic Type, For Road Purposes, October 1, 1973

.4 American Society for Testing and Materials (ASTM)

(a) ASTM D5/D5M-13 Standard Test Method for Penetration of Bituminous Materials, 2013

(b) ASTM D113-07 Standard Test Method for Ductility of Bituminous Materials, 2007

(c) ASTM D244-09 Standard Test Methods and Practices for Emulsified Asphalts, 2009

(d) ASTM D6930-10 Standard Test Method for Settlement and Storage Stability of Emulsified Asphalts, 2010

(e) ASTM D6933-13 Standard Test Method for Oversized Particles in Emulsified Asphalts (Sieve Test), 2013

(f) ASTM D6935-11 Standard Test Method for Determining Cement Mixing of Emulsified Asphalt, 2011

(g) ASTM D6997-12 Standard Test Method for Distillation of Emulsified Asphalt, 2012

(h) ASTM D2042-09 Standard Test Method for Solubility of Asphalt Materials in Trichloroethylene, 2009

1.3 Definitions And Abbreviations

.1 Prime Coat: An application of liquid asphalt to an absorbent surface to waterproof and promote bonding between the surface being primed and the next course.

.2 Tack Coat: An application of liquid asphalt to ensure a bond between the surface being paved and the next course.

1.4 Measurement and Payment

.1 All costs associated with the supply and placement of asphalt prime coat and asphalt tack coat will be paid by square meters as per field measurement.

PART 2 - PRODUCTS

2.1 Materials

.1 The Contractor shall supply SS-1 asphalt oil for application.

.2 Anionic emulsified asphalts shall conform to the requirements specified in the following table, for the grade designated by the Company.

Table 02745 – 1
Specifications for Anionic Emulsified Asphalt

Asphalt Type	Slow Setting		ASTM Test Method
Asphalt Grade	SS-1		
Requirements	**Min.**	**Max.**	
Viscosity at 25°C, SF s	20	60	D244
Viscosity at 50°C, SF s	-	-	
Residue by Distillation, % by mass	55	(1)	D6997
Settlement in 5 days, % by mass (2)	-	5	D6930
Storage Stability Test 24 h, % by mass (3)	-	1	D6930
Sieve Test, % retained on a No. 1000 Sieve, % by mass (4)		0.10	D6933
Cement Mixing Test, % by mass	-	2.0	D6935
Tests on Residue from Distillation:			
Penetration at 25°C, 100g, 5 s, dmm	100	200	D5
Ductility at 25°C, and 5 cm/min., cm	60	-	D113
Solubility in Trichloroethylene, % by mass	97.5	-	D2042
Delivery Temperature, °C	40	70	

General Requirements:

1. All tests shall be performed within 15 days of date of delivery.
2. The asphalt shall be uniform in character, and shall have a refined petroleum base.

(1) Upper limit on % residue is governed by the consistency limits

(2) The test requirement for settlement may be waived when the emulsified asphalt is used in less than 5 days time.

(3) The 24 hour storage stability test may be used instead of the 5 day settlement test. In case of dispute the 5 day storage settlement test shall govern.

(4) CGSB 8-GP-2M, Sieves, Testing, Woven Wire, Metric

.3 Sand used for the blotting of excess asphalt due to prime shall be supplied by the Contractor.

PART 3 - EXECUTION

3.1 Installation

.1 Asphalt material for prime and tack coat shall be applied only when the surface to be treated is dry, when the weather is not foggy or rainy, and when the surface temperature is above 5°C.

.2 The asphalt material shall be applied by means of a self-powered pressure distributor equipped with the following control devices.

(a) Tachometer.

(b) Pressure gauge.

(c) Adjustable length spray bar.

(d) Positive displacement asphalt pump with separate power unit.

(e) Heating coils and burner capable of applying even heat to the asphalt material.

(f) Thermometer well and accurate thermometer.

.3 Before applying asphalt material, the Contractor shall ensure that the distributor meets the following adjustments and requirements:

(a) The distributor vehicle will maintain a constant height of the spray bar as the tank is unloaded.

(b) All spray bar nozzles are of the same manufacture, type, and size.

(c) Clogged nozzles have been removed and cleaned with solvent.

(d) All nozzles have been set in the spray bar so that the nozzle slots make the same angle (15º to 30º) with the longitudinal axis of the spray bar.

(e) The spray bar has been adjusted to the correct height to ensure uniform application without streaking.

(f) The spray bar has a positive shut-off to prevent dripping.

(g) The distributor is capable of maintaining a uniform speed.

.4 The distributor may be checked for calibration by the Contractor's third party inspections agency before being used on the Work. Before applying the asphalt material, loose dirt or other objectionable material shall be removed from the prepared surface in accordance with Section 2217 – Roadway Excavation, Compaction and Backfill. Where base courses become ravelled, the loose material shall be moistened and re-compacted to achieve a tight, uniform surface.

.5 The asphalt shall be uniformly applied without streaking.

.6 Joints and seams shall not be excessively overlapped. Structures, wheel guards, guardrail, and other roadway appurtenances shall not be spattered by the asphalt material. The Contractor shall remove, at his own expense, any spattering caused by his operation. Areas missed by the distributor or inaccessible to the distributor shall be treated using a hand spray or pouring pot.

.7 Traffic shall not to be permitted to travel on prime coat until 6 hours after application or until it has cured. After this period of time, excess asphalt material remaining on the surface shall be blotted by sand before traffic is permitted to travel on the surface. The "blotter sand" can be any clean sand.

.8 Where traffic must be accommodated, the Contractor shall apply the prime or tack coat covering up to only one-half of the roadway surface at a time. Other portions across the roadway shall not be sprayed until previous applications have properly cured and in the case of prime coat, all puddles and excess free asphalt has been blotted.

.9 In all situations, prime coat and tack coat shall be maintained by the Contractor at his own expense including the cost of the required liquid asphalt. Any area of prime coat or tack coat that has become fouled shall be repaired before the asphalt concrete pavement is placed.

END OF SECTION 02745

DIVISION 3 CONCRETE

PART 1 - GENERAL

This section specifies requirements for concrete formwork, falsework and their accessories for concrete construction. The Work includes design, construction, erection and removal of concrete formwork, falsework and accessories.

1.1 RELATED WORK

.1 Concrete Reinforcement - Section 03200

.2 Cast-In-place Concrete - Section 03300

.3 Precast Concrete - Section 03400

1.2 REFERENCE STANDARDS

.1 Concrete Materials and Methods of Concrete Construction - CSA-A23.1

.2 Methods of Test for Concrete - CSA-A23.2.

.3 ACI Detailing Manual - ACI 315-80

.4 Falsework for Construction Purposes - CSA-S269.1.

1.3 DESIGN

.1 Design of concrete formwork and falsework are the responsibility of the Contractor.

1.4 SUBMITTALS

.1 Submittals shall be in accordance with Section 01300 Submittals.

.2 Submit shop drawings of proposed formwork and/or falsework for review if requested.

.3 Show material sizes and grades, and spacing of members.

.4 Indicate rate and sequence of concrete placing used in design of formwork.

.5 Shop drawings shall bear the stamp of a qualified Professional Engineer registered in Alberta.

.6 Submit for review shoring and reshoring provisions, and removal schedules.

.7 Submit for review proposed curing procedures.

.8 Submit for review proposed hoarding and heating methods for cold weather concreting.

PART 2 - PRODUCTS

2.1 FORMS

.1 Use material of suitable strength and quality to produce the specified surface finish.

.2 Use forms which are watertight, unwarped, non-absorbent and non-staining.

2.2 FORM TIES

.1 Use only ties with ends removable to a distance of not less than 38 mm from the face of the finished concrete.

.2 Form ties with a removable cone cast in the concrete shall produce a cone hole not more than 25 mm in diameter.

PART 3 - EXECUTION

3.1 INSPECTION

.1 Notify the Engineer to permit inspection of formwork at least one day before concreting. Inspection by Engineer of formwork shall be for conformance to project specifications, but not for structural strength and stability, which is the sole responsibility of the Contractor.

3.2 CONSTRUCTION AND CONTRACTION JOINT LAYOUTS

.1 Construction and contraction joints shall be constructed where required as shown on the plans, as specified and/or according to CSA-A23.1. The Contractor shall prepare and submit for approval, a location diagram and proposed details for all planned construction joints, and for layout of construction and contraction joints in slabs on grade, sidewalks and other concrete paved areas.

.2 Construction joints shall be placed at a maximum spacing of 6 m unless otherwise detailed or approved by the Engineer.

.3 Clean all construction joint surfaces which will be inaccessible after the erection of formwork.

3.3 FORMS

.1 Assemble and erect in accordance with the formwork design.

.2 Allow for deflection of the formwork due to the weight of concrete.

.3 Make all form joints watertight.

.4 Make form surfaces smooth and flat.

.5 Clean forms properly before assembling in position, and as necessary before concreting.

.6 Oil or coat forms before assembly in final position.

.7 Provide 20 mm chamfer at all exposed exterior corners with interior angle of 120 degrees or less.

.8 Provide access for cleaning prior to concreting.

.9 Do not use temporary removable spacers or blocks to support reinforcement or other items unless approved by the Engineer.

.10 Finished concrete exhibiting evidence of excessive form displacement, and/or excessive deflection shall be cause for rejection of the work and its removal and replacement at the Contractors own expense.

.11 Obtain Engineer's approval before framing openings not indicated on drawings.

3.4 TOLERANCES

.1 Construct formwork to maintain the tolerances of concrete work in Clause 10 of CSA-A23.1.

.2 Provide cambers to beam and slab forms as indicated on the drawings, as directed, or in accordance with the following:

Beams - 5 mm per 3000 mm of span
Slabs - 3 mm per 1000 mm of span

3.5 PLACING OF CONCRETE

.1 Make a final inspection and ensure that forms are satisfactory and no deleterious materials are present inside the area to be concreted.

.2 Observe forms during concreting operations and correct any displacement of the form.

3.6 FORM REMOVAL

.1 Remove forms so that no damage occurs to the concrete.

.2 Consider the location, character of the structure, weather and other conditions influencing the curing of concrete, in determining the time for removal of forms. Refer to Section 03300 - Cast-In-Place Concrete and CSA-A23.1.

.3 Leave shores in place until concrete has attained sufficient strength to adequately support its own weight together with construction loads likely to be imposed. See Clause 11 CSA-A23.1 for specific requirements.

(a) Vertical Surfaces - minimum 24 hrs provided curing is in accordance with Clause 21.

(b) Other Surfaces - Until concrete has attained 2/3 of the specified 28 day strength, or to the Engineers approval.

.4 Re-use of formwork and falsework subject to requirements of CSA-A23.1.

END OF SECTION 03100

PART 1 - GENERAL

This section specifies requirements for the supply, fabrication and placing of reinforcing steel, including necessary supports, spacers, and related accessories.

1.1 RELATED WORK

.1 Concrete Formwork - Section 03100

.2 Cast-In-Place Concrete - Section 03300

.3 Precast Concrete - Section 03400

1.2 REFERENCE STANDARDS

.1 Concrete Materials and Methods of Concrete Construction CSA-A23.1.

.2 Billet-Steel Bars for Concrete Reinforcement - CSA-G30.18.

.3 Welded Steel Wire Fabric for Concrete Reinforcement - CSA-G30.5.

.4 ACI Detailing Manual - ACI 315.80.

.5 CRSI Manual of Standard Practice.

1.3 SUBMITTALS

.1 Submit shop drawings in accordance with Section 01300 - Submittals, at least 10 days before fabrication.

.2 Submit bending schedules and placing drawings.

.3 Show bar size, spacing, location and quantities to permit correct placement without reference to structural drawings.

.4 Provide details to show placement of reinforcing where special conditions occur.

.5 Details shall be in accordance with ACI 315.

.6 Submit certificates and mill tests for the material supplied as requested by the Engineer.

1.4 PRODUCT DELIVERY, STORAGE AND HANDLING

.1 Ship bar reinforcement in standard bundles, easily identifiable and marked in accordance with the bar lists.

.2 Store reinforcement to prevent deterioration or contamination by dirt, detrimental rust, loose scale, paint, oil or other foreign substances that will destroy or reduce bond.

.3 Do not straighten or rebend reinforcement in any manner.

.4 Do not use bars kinked or bent by improper handling or storage.

PART 2 - PRODUCTS

2.1 REINFORCING STEEL

.1 Reinforcing steel to meet CSA-G30.12 as shown on drawings:

(a) All bars shall be 400 MPa grade

.2 Welded steel wire fabric to CSA-G30.5, in flat sheets only.

2.2 CHAIRS, BOLSTERS, BAR SUPPORTS, SPACERS

.1 Provide adequate support of reinforcement (according to CRSI Manual of Standard Practice).

.2 For exposed or architectural concrete surfaces use accessories which are plastic coated, stainless steel or as indicated on the drawings.

.3 Precast concrete block supports must be equal in strength and quality to the concrete in the structure.

.4 Chairs, bolster bar supports and spacers shall have sufficient strength to support the reinforcing under normal construction conditions. Brick shall not be used for bar supports.

2.3 FABRICATION

.1 Fabricate reinforcing steel from bar sizes and grades indicated within the following tolerances:

(a) Sheared length: plus or minus 25 mm.

(b) Depth of truss bar: plus or minus 13 mm.

(c) Stirrups, ties and spirals: plus or minus 13 mm.

(d) Location of bends: plus or minus 25 mm.

.2 Unless otherwise indicated, fabricate in accordance with CSA-A23.1.

PART 3 - EXECUTION

3.1 INSPECTION

.1 Notify Engineer to permit inspection after placement is completed. Reinforcing for all concrete pours shall be inspected after placing and prior to concreting.

.2 Provide adequate notice of scheduled pours to facilitate inspection of reinforcement (minimum of 24 hours).

3.2 PLACING OF REINFORCEMENT

.1 Place reinforcement as shown on the reviewed shop drawings and in accordance with CSA-A23.1.

.2 Support reinforcement in position as follows:

(a) Beams, walls, and columns - laterally support reinforcement with supports in pairs on opposite faces.

(b) Do not use supports which will be forced into the supporting formwork or soil by the weight of the reinforcement or other construction loads.

(c) Separate layers of bars by precast mortar blocks, bars or equally suitable devices. Do not use pebbles, pieces of broken stone or brick, metal pipe or wooden blocks.

(d) Do not place bars on layers of fresh concrete as the work progresses or install bars during placing of concrete.

.3 Provide concrete cover as follows unless detailed otherwise on drawings:

(a)	Cast against and permanently exposed to earth	75 mm
(b)	Exposed to earth, weather or water:	
	No. 20 through No. 55 bars	50 mm
	No. 15 bars, 16 mm wire and smaller	40 mm
(c)	Not exposed to weather or not in contact with the ground:	
i)	Slabs, walls and joists:	
	No. 45 and No. 55 bars	40 mm
	No. 35 bars and smaller	20 mm
ii)	Beams, girders, and columns: Principal reinforcement, ties, stirrups and spirals	40 mm
iii)	Shells and folded plate members:	
	No. 20 bars and larger	20 mm
	No. 15 bars, 16 mm wire, and smaller	15 mm
iv)	Slabs on grade (top surface)	40 mm

3.3 WELDING OF REINFORCEMENT

.1 Welding of reinforcing bars is not permitted.

3.4 SPLICING OF REINFORCEMENT

.1 Splice bars only as shown on the drawings or approved by the Engineer.

.2 Bar splices shall conform to CSA3-A23.3, Type B, unless noted.

.3 Lap adjacent sheets of wire fabric to provide an overlap of at least one cross wire spacing plus 50 mm, measured between outermost cross wires of each sheet.

3.5 DETAILS

.1 Corner Bars: Install corners bars in walls and beams to match the larger size of normal reinforcement unless otherwise noted on the drawings.

.2 Openings in slabs or walls: Unless otherwise noted, install 2 additional 15 M bars on all sides of every opening, one near each concrete face or the number of bars intercepted, divided equally between the two sides, whichever is greater. Bars to extend one lap length past each side of the opening.

END OF SECTION 03200

PART 1 - GENERAL

This section specifies requirements for design and preparation of the concrete mix, handling, placing, finishing and curing of cast-in-place concrete.

1.1 RELATED WORK

.1 Concrete Formwork - Section 03100

.2 Concrete Reinforcement - Section 03200

.3 Precast Concrete - Section 03400

1.2 REFERENCE STANDARDS

.1 Concrete Materials and Methods of Concrete Construction - CSA-A23.1.

.2 Methods of Test for Concrete - CSA-A23.2.

.3 Portland Cement - CSA-A5.

.4 Supplementary Cementing Materials - CSA-A23.5.

.5 Chemical Admixtures for Concrete - CSA-A266.2.

.6 Air-Entraining Admixtures for Concrete - CSA-A266.1.

.7 Have available on-site one copy of CSA-A23.1 and CSA-A23.2. These shall form the basis for acceptable standards of concrete practice and methods.

1.3 SUBMITTALS

.1 Submit mix design and aggregate gradation curves for review at least 10 days in advance of concreting.

.2 Submit samples of aggregates, water and cement to be used, to an approved testing agency, if required by the Engineer.

.3 Submit schedule of proposed construction joints to the Engineer for review.

.4 Submit mill certificates for cement and supplementary cementing materials required by Engineer.

1.4 QUALITY CONTROL TESTING

.1 The Contractor will retain and pay for the services of an independent testing agency.

.2 Allow for casual labour and expenses in conjunction with testing.

.3 Concrete Cylinder tests:

(a) At least one set of 3 cylinders will be made for each days concreting or for each 40 cubic metres of concrete placed, for each type of concrete mix.

(b) Cylinders shall be taken at the point of deposit of the concrete.

(c) For each test slump and air content will be taken and 3 standard cylinders will be prepared and cured under laboratory conditions.

(d) One cylinder from each test will be broken at 7 days and the remaining cylinders at 28 days.

(e) When temperatures are below 5°C additional field cured cylinders will be prepared to verify that adequate strength is attained.

.4 Test results shall be delivered directly from the test laboratory to the Engineer and to the Contractor.

.5 Test reports shall include:

(a) Project name

(b) Date and time of sampling

(c) Supplier, truck and departure time

(d) Specified strength and admixtures

(e) Cement type

(f) Exact location in structure

(g) Slump and air content

(h) Maximum aggregate size

(i) Test strength and age at time of test

(j) Date cylinder received by lab

(k) Testing technician identification

(l) Weather and temperature information.

.6 If any tests reveal concrete not meeting Specifications, the Engineer may enforce one or more remedial procedures such as:

(a) Change in mix design

(b) Change in concrete supplier

(c) Additional testing by coring or impact hammer

(d) Replacement of work

(e) Other procedures as necessary

.7 The costs of remedial work to bring concrete to meet specifications shall be borne by the Contractor.

.8 Refer to Section 01400 - Quality Control.

1.5 QUALITY ASSURANCE TESTING

.1 The Owner may retain and pay for the services of an independent testing agency for testing for quality assurance for the Owner's purposes.

1.6 PRODUCT DELIVERY, STORAGE AND HANDLING

.1 Store all material in accordance with CSA-A23.1, Storage of Materials, except as otherwise noted.

.2 Store each shipment of cement separately to provide access to identification and inspection of each shipment.

.3 Clean stockpile areas of foreign materials.

.4 Do not use stockpiled material within 150 mm of the ground surface if the stockpile is placed directly on the ground.

PART 2 - PRODUCTS

2.1 CEMENT

.1 Conform to CSA-A5 Portland Cement.

.2 Use Type 50 Sulphate Resistant Cement for sidewalks, curbs, footings and walls below ground level, unless specified otherwise.

2.2 WATER

.1 Potable.

2.3 FINE AND COARSE AGGREGATES

.1 Conforming to CSA-A23.1.

2.4 AIR-ENTRAINING ADMIXTURES

.1 Air entrainment to CSA-A266.1.

.2 No other air entraining mixture shall be used regardless of the type of cement selected, unless approved by the Engineer.

2.5 CHEMICAL ADMIXTURES

.1 Conforming to CSA-A266.2.

.2 Use only as approved by the Engineer.

2.6 VAPOUR BARRIER

.1 0.15 mm polyethylene with 150 mm laps taped and sealed, except where noted otherwise on the drawings.

2.7 FLOOR HARDENER

.1 Metallic floor hardener: premixed, (coloured) (light reflective) (spark resistant) (static disseminating) metallic hardener.

.2 Non-metallic floor hardener: premixed (energy aggregate) (quartz aggregate) (coloured) abrasion resistant hardener.

.3 Products shall be as manufactured by Master Builders Co. Ltd. or approved equivalent alternate. Colour to be selected by the Engineer.

2.8 DOVETAIL ANCHOR SLOTS

.1 Use 0.60 mm galvanized steel, insulation-filled slots.

.2 Use 0.65 mm thick galvanized sheet steel for reglets for flashing.

2.9 POZZOLANIC MINERAL ADMIXTURES

.1 Conforming to CSA-A23.5.

.2 Use only as approved by the Engineer.

2.10 FLYASH

.1 Flyash may be used only with the approval of the Engineer.

.2 Maximum cement replacement of 20%.

2.11 CONCRETE CURING COMPOUND

.1 Chlorinated rubber type compound conforming to CSA-A23.1, Type 1.

.2 On coloured floors, wax-free curing and sealing compound "Floor Coat" as manufactured by Master Builders Co. Ltd., or approved equivalent alternate.

.3 Where topping or waterproofing is to be applied, ensure adequate surface preparation of the concrete for proper bonding. (Clause 21, CSA-A23.1)

2.12 EXPANDING GROUT

.1 Premixed non-shrink, non-metallic aggregate, developing minimum compressive strength of 35 MPa at 28 days.

.2 Use only as shown on the drawings or approved by the Engineer.

2.13 CONCRETE MIX REQUIREMENTS

.1 Unless indicated otherwise, mix design shall conform to the following.

Structural Component	Agg. Size (mm)	Minimum Concrete Strength MPA (28 days)	Slump (mm)	Cement Type	% Air Entrainment
Piles	25	25	100	50	4-6
Grade Beams	20	25	75-100	50	4-6
Slab on Grade	20	25	75	10	4-6
Structural Slab, Wall, Columns, Beams	20	30	75	10	4-6
Sidewalks	20	30	60	50	5-7
Topping	14	25	75	10	4-6
Precast	20	35	75	10	4-6

2.14 SLURRY COAT

.1 Slurry coat mix to be 2 parts sand, 1 part cement and 1 part water.

2.15 MIXING

.1 Ready-mixed concrete:

(a) Mix premixed or Transit-mixed concrete according to CSA-A23.1 and to ASTM-C94.

(b) Ensure that the concrete supplier has sufficient plant capacity and transporting apparatus to provide delivery so that the interval between successive loads does not exceed 15 minutes.

.2 Site-Mixed Concrete shall be in accordance with CSA-A23.1-M77.

PART 3 - EXECUTION

3.1 INSPECTION

.1 The Engineer will inspect forms, foundations, reinforcing steel, construction joints, mixing, conveying and placing equipment before concreting.

3.2 PREPARATION

.1 Do not place concrete on soil that has been softened by mechanical disturbance or moisture.

.2 Retighten forms at construction joints.

.3 Roughen, thoroughly remove foreign matter and laitance, and saturate the hardened concrete at construction joints with water prior to concreting.

.4 Make suitable arrangements to prevent damage to fresh concrete by adverse weather conditions, such as rain, wind or extreme temperatures.

.5 Concrete shall not be poured against frozen ground, frozen concrete or into frosted formwork.

.6 Prepare all sleeves and ducts to be cast into concrete at the same time as the concrete formwork to ensure that correct assembly and fit is obtained.

.7 Check architectural, mechanical and electrical drawings for sleeves, inserts, etc.

.8 Set sleeves, ties, anchor bolts, pipe hangers and other inserts and openings in concrete floors and walls as required.

.9 Install continuous preformed vertical anchor slots to forms where masonry walls or partitions abut concrete vertical surfaces.

3.3 PLACING OF CONCRETE

.1 According to CSA-A23.1, and as specified herein.

.2 All formwork shall be cleaned of all debris, loose material, snow and ice immediately prior to pouring.

.3 Ensure proper placement and support of reinforcement and embedded material immediately ahead of a pour.

.4 Do not temporarily displace reinforcement for convenience in placing concrete.

.5 Do not use wood or other temporary spreaders or spacers.

.6 Do not insert reinforcement into fresh concrete.

.7 Confine concrete in a suitable vertical drop pipe to within 1.0 m or less of the concrete in place.

.8 Set screeds accurately for level surfaces or to maintain cambers as required.

.9 Ensure that concrete is adequately consolidated in the forms.

.10 Place concrete in such a manner that the concrete in the form is still plastic and can be integrated with fresh concrete.

.11 To prevent segregation, deposit concrete in approximately horizontal layers of 300 to 450 mm thickness, as near as possible to its final position.

3.4 COLD WEATHER REQUIREMENTS

.1 When the air temperature is at or below 5°C, or when there is a possibility of it falling to that limit within 24 hours of placing, the requirements according to CSA-A23.1 shall be met.

.2 Calcium chloride to 2% may be used upon written approval of the Engineer.

.3 Withdraw protection and heating gradually so that air temperature around the concrete does not drop more than 15 Celsius degrees per day.

.4 Concrete shall be protected from alternate freezing and thawing for 14 days.

.5 Provide enclosures for heating such that air circulation is maintained.

.6 Frozen concrete will be rejected.

3.5 HOT WEATHER CONCRETE WORK

.1 Hot weather shall be considered to be an air temperature in the shade, of 23°C or greater.

.2 Hot weather methods shall conform to CSA-A23.1.

.3 The concrete temperature at the time of placing in hot weather shall not exceed those specified in CSA-A23.1. In the event that this limit is exceeded the concrete operations shall be suspended until the constituent materials of concrete are cooled.

.4 Retarding admixtures shall be used only if approved by the Engineer prior to use in the concrete.

.5 The use of ice may be required to lower the temperature of concrete for large pours.

3.6 JOINTS

.1 Construction, and/or control joints shall be provided where required and as shown on the plans or according to CSA-A23.1. Control joints should be spaced at a maximum of 6 metres unless otherwise indicated.

.2 Carefully finish all face edges exposed to view true to line and elevation. Apply a neat cement paste or approved bonding agent to the hardened concrete immediately in advance of the fresh concrete.

.3 At water tight horizontal joints, apply the first layer of new concrete above the joint with an excess of mortar, obtained by omitting 20 to 50 percent of coarse aggregate from the normal mix.

.4 Make all construction, or control joints in accordance with details shown on the drawings, layout to be submitted by Contractor for approval by Engineer.

.5 Allow at least 2 hours after placing concrete in supporting columns or walls before placing in beams, girders or slabs above.

.6 Place beams, girders, brackets, column capitals and haunches monolithically with the floor system, unless otherwise approved by the Engineer.

.7 See typical details for isolation joints at columns, and other locations.

.8 Construction joint layouts shown on the drawings take precedence over above requirements.

3.7 GROUTING

.1 Grout underside of steel columns and beam bearing plates with non-shrinking grout to manufacturer's instructions.

3.8 VAPOUR BARRIER

.1 Install vapour barrier under concrete slabs-on-grade inside building.

.2 Lap vapour barrier minimum 150 mm at joints and seal with mastic cement.

.3 Seal punctures in vapour barrier before placing concrete. Use vapour barrier material at least 150 mm larger than puncture and seal each patch with mastic cement.

3.9 FINISHING

.1 To CSA-A23.1 and as specified herein:

.2 Ordinary surface finish

(a) Use on concrete surfaces not exposed to view in the completed structure.

(b) Chip off fins and irregular projections.

(c) Patch honeycomb and fill tie holes with mortar containing approved bonding agent. Mix according to manufacturer's directions.

.3 Rubbed finish

(a) Use on formed concrete exposed to view in the completed structure.

(b) Remove fins and projections, patch honeycomb and fill tie holes as required.

(c) Saturate with water and rub with medium coarse carborundum stone using a small amount of cement-sand mortar.

(d) Continue rubbing until a uniform surface with no irregularities is obtained. Do not remove the paste produced by this rubbing.

(e) Carry out final rubbing with a fine stone and water.

(f) After the surface is dry, remove loose powder by rubbing with burlap.

(g) Leave final surface free from unsound patches, paste, powder and objectionable marks.

.4 Floated surface finish

(a) Strike off the compacted concrete to the cross section and elevation shown on the drawings. Keep a slight excess of concrete in front of the screed at all times.

(b) Obtain a uniform surface by floating as necessary. If floating is not completed before excess water appears at the surface, remove this water before continuing with floating.

(c) Add or remove concrete during floating as required to obtain a surface with no more than 3 mm deviation from the required surface in any 3 metre length.

(d) Do not overwork the concrete surface. Float only enough to obtain a dense uniform surface.

.5 Broomed finish

(a) After completion of Article 3.9.3 (d), broom to produce a non-slip surface with regular corrugations not more than 3 mm deep.

.6 Troweled finish

(a) After completion of Article 3.9.3 (d), trowel to produce a dense smooth finish.

.7 Surface hardener

(a) Concrete floors shall be finished with floor hardener applied at a rate (typical 5.0 kg/m^2 for medium duty), type and location as shown on the drawings. Apply according to manufacturer's instructions in conjunction with floating operations.

(b) Finish the floor to a hard dense surface free from pinholes, imperfections and trowel marks.

.8 Areas which will receive quarry tile and cement fill shall receive Type 4 - floated surface finish.

.9 Areas which will receive resilient tile and cement fill shall receive Type 6 steel trowel finish.

.10 Areas which are exterior walkways, driveways or landings, shall receive a broomed non-slip surface.

3.10 CURING

.1 Curing shall be according to CSA-A23.1 and as specified herein.

.2 Prevent loss of moisture from concrete surfaces for at least seven days after concreting.

.3 Protect unformed surfaces as follows, subject to approval by the Engineer.

(a) Curing compound

(b) Waterproof covering

(c) Sprinkling or ponding

(d) Damp sand, burlap or other suitable material

.4 Protect formed surfaces as follows, subject to approval by the Engineer.

(a) Leave forms in place and keep concrete wet by pouring water between concrete and forms.

.5 Maintain concrete temperatures as recommended according to CSA-A23.1.

3.11 FORM REMOVAL

.1 Forms shall not be removed until removal operations will cause no damage to concrete surfaces.

.2 Beam and slab soffit forms shall not be removed until sufficient strength has been attained for support of the applied dead and live loads and to minimize deflections.

See Clause 11 CSA-A23.1 for specific requirements.

3.12 PATCHING AND FINISHING OF HARDENED CONCRETE

.1 Patching, if required and if allowed, shall be done immediately after stripping.

.2 Methods of patching and repair shall be submitted to the Engineer and accepted before repair work is started.

.3 All form ties shall be cut back a minimum of 25 mm and all tie holes shall be neatly patched and rubbed down.

3.13 DAMP PROOFING AND WATERPROOFING

.1 Preparation of concrete surfaces for damp proofing and waterproofing shall conform to CSA-A23.1.

.2 Application shall conform to manufacturer's recommendations.

3.14 CONCRETE SPECIALITIES

.1 Provide and install all concrete specialities as shown on the drawing and/or as necessary to complete the concrete work.

.2 Included are fibreboard expansion joint covers, water stop and bond breakers.

END OF SECTION 03300

PART 1 - GENERAL

This section specifies requirements for the manufacture, delivery and erection of precast concrete units, including bearing pads, dowels, grout and other miscellaneous items.

1.1 RELATED WORK

.1 Concrete Formwork - Section 03100

.2 Concrete Reinforcement - Section 03200

.3 Cast-In-Place Concrete - Section 03300

1.2 REFERENCE STANDARDS

.1 Work to meet the requirements of applicable CSA Standards unless noted otherwise.

.2 Design of Concrete Structures for Buildings - CSA-A23.3

.3 Precast Concrete Materials and Construction- CSA-A23.48

.4 National Building Code of Canada 1985.

.5 Welded Steel Construction (Metal Arc Welding) - CSA-W59

.6 Qualification Code for Manufacturers of Architectural and Structural Precast Concrete - CSA-A251

1.3 DESIGN

.1 All pre-stressed concrete products shall be designed to support the live and superimposed dead load in accordance with the above standards and in accordance with loads indicated on the drawings for the indicated span direction.

.2 Derive dead loads from the details shown.

.3 Take into account all handling and erection stresses.

.4 Design shall be prepared by an engineer experienced in pre-stressed concrete design.

.5 All drawings shall be sealed and signed by a qualified Professional Engineer, registered in the Province of Alberta.

1.4 SUBMITTALS

.1 Submit the following data to the Engineer for his/her review at least ten days in advance of fabrication: shop drawings showing layout plan, fabrication details, estimated camber, connection and anchorage details, member identification marks and calculations for design of pre-stressed concrete members by a registered Professional Engineer, registered in the province of Alberta.

.2 Do not proceed with manufacture of units prior to receiving review of the Engineer.

1.5 PRODUCT DELIVERY, STORAGE AND HANDLING

.1 Support units at points of support approximately the same as when the unit is in final position.

.2 Take care to prevent cracking or other damage.

.3 Identify all miscellaneous items clearly.

1.6 PREQUALIFICATION OF MANUFACTURER

.1 All precast elements within the scope of this specification and drawings shall be fabricated by a manufacturing plant certified in the appropriate category according to CSA-A251, Qualification Code for Manufacturers of Architectural and Structural Precast Concrete.

.2 Steel fabricators for steel components shall be approved by the Canadian Welding Bureau under CSA-W47.1.

1.7 QUALITY CONTROL

.1 Refer to Section 01400 - Quality Control.

PART 2 - PRODUCTS

2.1 HIGH TENSILE STRENGTH STRAND

.1 Uncoated, stress-relieved, seven-wire strand, manufactured and supplied according to ASTM A416 with minimum ultimate tensile strength of 1860 MPa.

2.2 REINFORCING STEEL

.1 Conforming to the requirements of Section 03200 - Concrete Reinforcement.

2.3 CONCRETE

.1 Conforming to the requirements of Section 03300 - Cast-In-Place Concrete except as noted in this section or on the drawings.

2.4 FORMS

.1 Conforming to the requirements of Section 03100 - Concrete Formwork except as noted in this section or on the drawings.

.2 Mortar-tight and sufficiently rigid to prevent distortion during construction of the unit.

2.5 STEEL

.1 Steel for the manufacture of miscellaneous iron components shall be from CSA-G40.21.

.2 Welding shall be in accordance with CSA-W59.

PART 3 - EXECUTION

3.1 DIMENSIONAL TOLERANCES

.1	Length:	± 12 mm per 30 m
	Width:	± 3 mm
	Depth:	± 6 mm
	Duct Location:	surface to duct ±10 mm
.2	Camber:	± 42 mm per 100 m (from average value)
	Sweep:	42 mm per 100 m (from average value)
	Warpage or Tilt of Ends:	6 mm
	Out of Flatness of Bearing Areas	3 mm
.3	Dowel Holes:	out of plumb, maximum 6 mm out of position, maximum 6 mm

3.2 CAST-IN MATERIAL

.1 Locate accurately and secure firmly.

.2 Clean weld plates and fixing of all concrete.

.3 Maintain distance from forms by means of stays, blocks, ties, hangers or other approved supports. Chairs which are in contact with exterior surfaces of the concrete shall be galvanized metal or plastic.

3.3 STRESSING

.1 Record jacking force and elongation for each strand stressed.

.2 Transfer stress to the concrete only after job cylinders indicate that the required transfer strength has been attained.

.3 Transfer stress so as to minimize sudden loading of the concrete and keep lateral eccentricity of pre-stress to a minimum.

3.4 CURING

.1 Curing shall be to CSA-A23.1 unless noted otherwise.

.2 Cure all units under conditions as similar as practicable to minimize differential cambers, shrinkage, etc.

.3 If steam or radiant heat curing is used, carry out according to CSA-A23.4. Take particular care that heat is not applied too soon after casting, that rapid changes in temperature are avoided, and that stress is transferred to the unit as soon as practicable after discontinuing heat.

.4 Do not expose units to temperature below 0°C until the specified 28 day strength has been attained.

3.5 ERECTION

.1 Establish all lines, dimensions and marks required to ensure that units will be installed in correct position.

.2 Install bearing pads, dowels and other items as required.

.3 Install units in correct position relative to the supports and to each other.

.4 Grout as shown on the drawings using a mix which will produce a minimum of 35 MPa at 28 days. Mix design, procedure and curing methods to be submitted for review by the Engineer.

.5 Welding of connections shall be to CSA-W59.

END OF SECTION 03400

APPENDIX A

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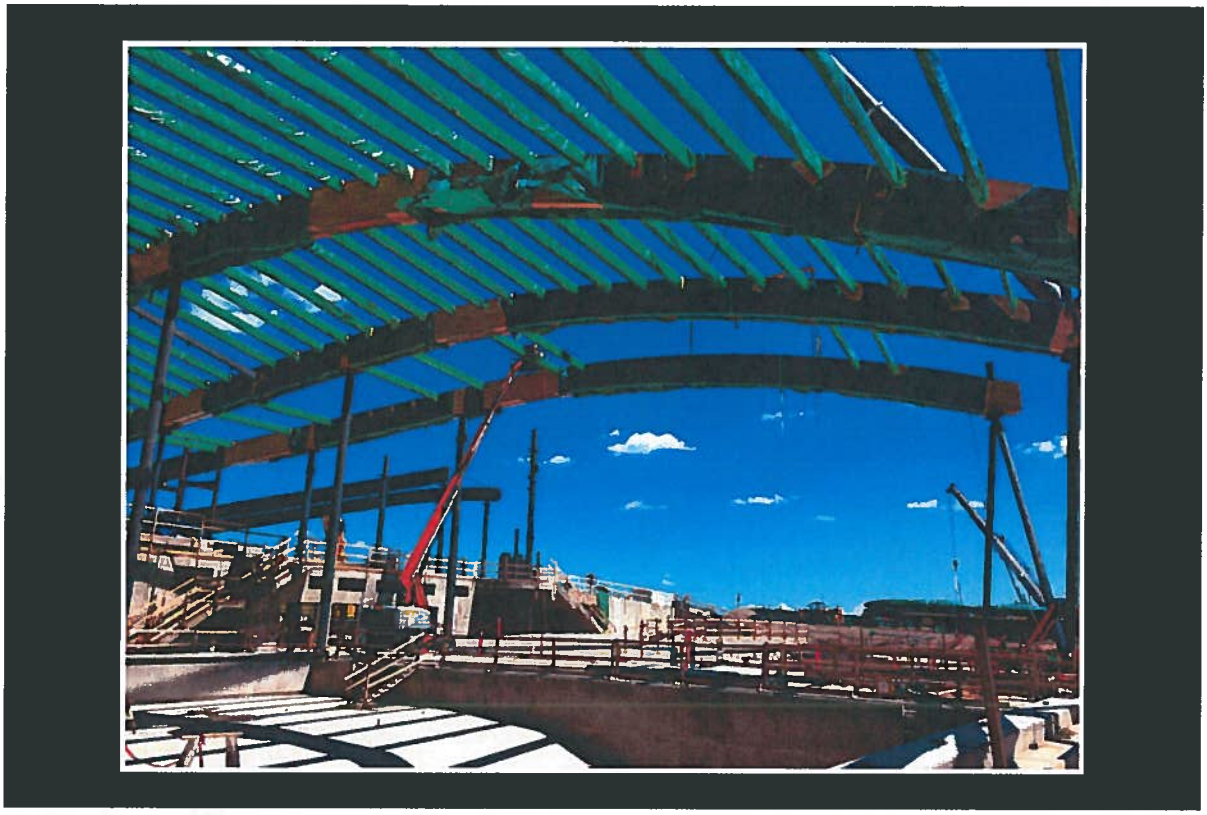

Environmental Construction Operations (ECO) Plan Framework

2017 EDITION

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Edmonton

PUBLISHING INFORMATION

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PREPARED BY:	Alberta Transportation The City of Calgary The City of Edmonton
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Environmental Construction Operations (ECO) Plan Checklist

Project Name: _____

Contractor's On-Site Representative(s) (Name & Company): _____

ECO Plan submitted to (Name & Jurisdiction): _____

Note: All checklist items are required in the ECO Plan. Explain any deficiencies in the comments section on page b.
Ensure that this three-page checklist is signed and submitted with the ECO Plan.

ECO Plan Framework Step	Content Requirements	YES	NO	N/A
STEP 1: Project Description				
1.1 Project Overview	Briefly describe the construction project and its location.	☐	☐	☐
1.2 Site Activities	Detail the scope of work. List all construction and demolition activities and specify the main equipment that will be used during those activities.	☐	☐	☐
1.3 Project Schedule	Provide a project schedule that includes scheduled shut-downs and restricted work periods due to environmental requirements.	☐	☐	☐
STEP 2: Project Setting & Site Drawing(s)				
2.1 Site Characteristics	Describe the existing condition of the project site.	☐	☐	☐
2.2 Environmental Sensitivities	Describe site-specific sensitive features that could be impacted by the Contractor's activities.	☐	☐	☐
2.3 Site Drawing(s)	Provide site drawing(s) that detail the site location, set-up and layout; erosion and sediment controls; and, environmental sensitivities.	☐	☐	☐
STEP 3: Potential Environmental Impacts & Controls				
3.1 Permits, Approvals, Authorizations & Notifications	Append copies of all project permits, approvals, authorizations and notifications (and their associated applications, when referenced in the approval) to the ECO Plan, and list their file names, numbers and environmental conditions and/or restrictions in a table like Table 3-1.	☐	☐	☐
3.2 Regulatory Compliance	Describe specific regulatory requirements (additional to those listed in Step 3.1) as well as corporate policy and/or program requirements that directly impact or restrict the construction project.	☐	☐	☐
3.3 Potential Environmental Impacts & Mitigation Strategies	Identify all potential project-specific environmental issues and impacts. Describe procedures, controls or best management practices (BMPs) that will be used to prevent or reduce adverse environmental impacts.	☐ ☐	☐ ☐	☐ ☐
3.4 Erosion & Sediment Control	Provide project-specific, jurisdiction-appropriate erosion and sediment controls.	☐	☐	☐
3.5 Municipal Tree Protection	Provide project-specific, jurisdiction-appropriate municipal tree protection measures.	☐	☐	☐

ECO Plan Framework Step	Content Requirements	YES	NO	N/A
STEP 4: Hazardous Materials & Waste Management				
4.1 Hazardous Materials	List every hazardous material to be used or stored on site by the Contractor and all sub-contractors, and provide appropriate handling, containment, storage and disposal methods.	☐	☐	☐
4.2 Waste Management	List all anticipated hazardous and non-hazardous waste materials along with proper handling and disposal methods. Provide all additional jurisdiction-specific handling procedures.	☐ ☐	☐ ☐	☐ ☐
STEP 5: ECO Plan Implementation				
5.1 On-Site Representative	Provide name(s) and contact details for the Contractor's On-Site Representative(s).	☐	☐	☐
5.2 Training & Communication	Detail the procedures that will be used to train staff and sub-contractors in their ECO Plan responsibilities.	☐	☐	☐
5.3 Monitoring & Reporting	Describe monitoring and inspection procedures that suit the nature and scale of the project and meet regulatory and contractual requirements.	☐	☐	☐
5.4 Documentation	Describe the environmental information and ECO Plan records that will be kept in up-to-date hard copies on the project site.	☐	☐	☐
5.5 ECO Plan Update	Provide ECO Plan review and update procedures. Append a current ECO Plan Revision Summary table (e.g., Table 5-3) to all updated ECO Plans.	☐ ☐	☐ ☐	☐ ☐
STEP 6: Environmental Emergency Procedures				
6.1 Environmental Emergency Prevention & Response	Identify potential incidents that may impact the environment, and provide appropriate prevention and response procedures. In addition, provide an environmental emergency response contact list.	☐	☐	☐

Comments ***(include relevant special provisions and/or conditions for the project, and explain any deficiencies in the ECO Plan):***

Contractor Responsibilities

All Contractors need to be aware of their responsibilities for protecting the environment. The Contractor is responsible, either by its own actions or through its sub-contractors, for providing the resources needed to develop and implement the ECO Plan. The Contractor is responsible for ensuring sub-contractors understand their roles and responsibilities, and operate in compliance with the ECO Plan.

Contractors must refer to the terms and conditions contained in applicable contractual and regulatory documents to be fully aware of their responsibilities. In general, Contractors must:

a)	Identify the potential environmental issues and develop environmental mitigation measures to prevent or minimize environmental impacts.
b)	Identify and acknowledge permits, approvals, authorizations, notifications, guidelines, standards, policies and programs applicable to the project.
c)	Prepare and update the ECO Plan in accordance with this ECO Plan Framework.
d)	Submit copies of the ECO Plan and all other required documentation to the consultant for Alberta Transportation projects or The City Project Manager for municipal projects.
e)	Revise the ECO Plan as required based on reviewer (i.e., The City of Calgary, The City of Edmonton or the consultant for Alberta Transportation projects) comments.
f)	Identify an on-site individual to be the Contractor's On-Site Representative to maintain environmental controls and address any environmental issues or questions that arise. The Contractor must identify this individual within the ECO Plan (see page a of the ECO Plan Checklist and Step 5.1) and at the pre-construction meeting.
g)	Train staff and sub-contractors so they can identify, address and report potential environmental problems.
h)	Review the ECO Plan requirements at orientation meetings, the pre-construction meeting, tailgate meetings, etc.
i)	Implement and maintain environmental mitigation measures in accordance with the ECO Plan.
j)	Correct and record any deficiencies in a timely and appropriate manner.
k)	Take corrective action (e.g., shut down work) when it is recognized that an impact to the environment may occur or has occurred.
l)	Ensure that all sub-contractors comply with the ECO Plan.
m)	Sufficiently monitor the work site to ensure that the ECO Plan is effective for all conditions, including inclement weather and shut-down periods. Document all monitoring efforts.

This ECO Plan is complete to the best of our abilities. The undersigned acknowledges and accepts the responsibilities detailed herein.

Contractor Principal-in-Charge Signature	Name (please print)	Date

Introduction

The Environmental Construction Operations (ECO) Plan Framework guides the development of ECO Plans for Alberta Transportation, The City of Calgary and The City of Edmonton. ECO Plans ensure the following:

- environmental considerations are integrated into project decision making
- the project is compliant with applicable regulations, bylaws and guidelines
- all parties demonstrate environmental commitment, both in writing and in action, to their stakeholders and the public

ECO Plan Definition

An ECO Plan is a project-specific plan that identifies and mitigates the potential environmental impacts of construction. Contractors are responsible for developing and implementing ECO Plans for their projects. ECO Plans cover the following topics:

- project setting, activities and schedule
- applicable permits, approvals and regulations
- potential environmental impacts and controls
- hazardous materials and waste management
- ECO Plan implementation procedures
- environmental emergency response procedures

DEFINITION: Environmental Construction Operations (ECO) Plan
An ECO Plan is a Contractor's plan to identify and mitigate the environmental impacts that may result from their activities.

ECO Plan Process

It is the Contractor's responsibility to develop and implement an ECO Plan. ECO Plans may be required by Alberta Transportation, The City of Edmonton or The City of Calgary in the contract/tender documents.

Project-specific ECO Plans must follow this Framework, and adopt the headings and structure provided here. The ECO Plan checklist (pages a-c) must be completed and included with the ECO Plan; it should be used to ensure that the ECO Plan is complete. The ECO Plan Checklist must identify an On-Site Representative and be signed by the Contractor Principal-in-Charge.

The ECO Plan must include a completed ECO Plan checklist. This checklist must identify an On-Site Representative and be signed by the Contractor Principal-in-Charge.

Contractors must submit their ECO Plans to the appropriate jurisdiction at least 14 days prior to the scheduled start of construction. The reviewer will evaluate the ECO Plan, and one of the following will result:

1. **Acceptance —** If the ECO Plan is accepted to the mutual satisfaction of the Contractor and the reviewer (i.e., reviewers include The City of Calgary, The City of Edmonton or the consultant for Alberta Transportation projects), the Contractor will be advised in writing that the ECO Plan is complete.

2. **Follow-up or Revision —** If the reviewer identifies deficiencies or has questions, they will follow up with the Contractor. Incomplete ECO Plans will be returned to the Contractor for revision. ECO Plans must be completed to the mutual satisfaction of all parties. All changes to the ECO Plan must be documented (see Step 5.5; include a revision summary table such as Table 5-3) and copies of the updated ECO Plan forwarded to the reviewer and other parties, as applicable.

No work may begin until all parties have agreed to the ECO Plan.

The Contractor must submit the ECO Plan to the appropriate jurisdiction at least fourteen (14) days prior to the scheduled start of construction.

No work may begin until all parties have agreed to the ECO Plan.

ECO Plan Instructions

This Framework provides instructions for developing ECO Plans for Alberta Transportation, The City of Edmonton and The City of Calgary. All ECO Plans must follow this Framework, and adopt the headings and structure provided here.

ECO Plans must present organized, summarized information. When a document is well organized, the information is easy to use. All parties must use and understand the ECO Plan to successfully identify and mitigate the potential environmental impacts of the project.

The following sections describe the six components of an ECO Plan.

This document guides project-specific ECO Plan development.
Boxes (like this one) are located at the start of each section, and contain specific summaries of what is required in that section.

ECO Plan Template

The goal of Alberta Transportation, The City of Edmonton and The City of Calgary is to have quality, organized ECO Plans that describe the project, its potential effects and its mitigation and control measures. These ECO Plans are easily reviewed, understood and implemented by all parties. Unfortunately, many poor quality or incomplete ECO Plans are submitted, placing substantial burdens on the review process.

To address this challenge, Alberta Transportation, The City of Edmonton and The City of Calgary are developing a new, standardized format for ECO Plans. They have produced a draft ECO Plan template; this draft is available for use on a trial basis in the 2017 calendar year (ECO Plan Template; Internet Explorer required). The Province and Cities encourage all Contractors developing ECO Plans to try the template and submit feedback to ECOPlan@calgary.ca.

Step 1 Project Description

STEP 1		
	1.1 Project Overview	Briefly describe the construction project and its location.
	1.2 Site Activities	Detail the scope of work. List all construction and demolition activities and specify the main equipment that will be used during those activities.
	1.3 Project Schedule	Provide a construction project schedule that includes scheduled shut-downs and restricted work periods due to environmental requirements.

1.1 Project Overview

Briefly describe the construction project and its location.

In this section, briefly describe the nature and location of the construction project. The project description must include the following:

- type of project
- name and location of the project (including legal land description and municipal address, if applicable)
- site size
- details of the main components of the project, including any permanent and temporary structures

1.2 Site Activities

Provide a detailed scope of work. List the construction and demolition activities that will occur during the project and specify the main equipment that will be used during those activities.

In this section, provide the scope of work and list all construction and demolition activities (e.g., earthworks, surfacing, saw cutting, stream crossings) that will occur during the project. It is particularly important for the ECO Plan to describe specific on-site construction activities that could result in environmental impacts.

Construction projects use many different types of equipment. The Contractor will provide a project-specific list of the equipment that will be used during the construction and demolition activities. Some examples of equipment that could be included are as follows:

- General construction and demolition (e.g., personal hand tools, pumps, generators)
- Trucking and hauling (e.g., pickup trucks, delivery trucks, pump trucks)
- Earthmoving (e.g., excavators, graders, loaders, backhoes, bobcats, dump trucks)
- Lifting and material handling (e.g., mobile cranes, man lifts)
- Paving and compacting (e.g., asphalt pavers, drum compactors)
- Concrete handling (e.g., saw cutting equipment, concrete trucks)
- Drilling and trenching (e.g., directional drills, trenchers, hydrovac trucks)

1.3 Project Schedule

Provide a construction project schedule that includes scheduled shut-downs and restricted work periods due to environmental requirements.

The ECO Plan will include a project schedule that presents the sequence and timing of construction activities. It will identify any time-sensitive environmental considerations, including scheduled shut-downs and restricted work periods. For example, in-stream work may be restricted to the times outlined within federal and provincial regulatory approvals.

Step 2 Project Setting & Site Drawing(s)

STEP 2		
	2.1 Site Characteristics	Describe the existing condition of the project site.
	2.2 Environmental Sensitivities	Describe the site-specific or protected features that could be impacted by the Contractor's activities.
	2.3 Site Drawing(s)	Provide site drawing(s) that illustrate the site location; site set-up and layout; jurisdiction-appropriate erosion and sediment controls; and, environmental sensitivities.

2.1 Site Characteristics

Describe the existing condition of the project site.

In this section, describe the project site's topography, drainage and storm water infrastructure. It is helpful to include site photographs in this section.

2.2 Environmental Sensitivities

Describe site-specific sensitive or protected features that could be impacted by the Contractor's activities.

The Contractor must pre-screen the project site for environmental sensitivities and concerns. To pre-screen the site, review the contract documents and all applicable environmental information and reports, such as the following:

- Biophysical Impact Assessment
- Environmental Evaluation
- Historical Resources Impact Assessment
- Phase I and/or II Environmental Site Assessment
- Risk Management Plan

In this section, describe the sensitive or protected features that could be impacted by the Contractor's activities. This description must include source references, be specific to the project site, and highlight features that require protection such as:

- wildlife and wildlife habitat (consider both terrestrial and aquatic animals)
- waterbodies (e.g., wetlands, streams, creeks)
- vegetation (e.g., trees, rare plants, noxious weeds)
- archaeological, paleontological and/or other historical resources
- parks, protected areas and other designated lands
- site contamination and/or underground infrastructure (e.g., monitoring wells, pipelines)

Show all environmental sensitivities and protected features on the site drawing(s) (see Step 2.3).

2.3 Site Drawing(s)

Provide one or more site drawing(s).

In this section, provide site drawing(s) of appropriate scale showing:

- project location
- site set-up and layout
- erosion and sediment controls (as appropriate for the jurisdiction; see Step 3.4 and Table 3-4 for more details)
- environmental sensitivities (see Steps 2.2, 3.1–3.3 and 3.5 for more details)

The site drawing should contain standard map features (e.g., north arrow, scale, legend) and be at an appropriate scale to show the location of the project components and activities relative to existing features. Table 2-1 summarizes some additional details that may be relevant to include on the site drawing(s).

Table 2-1 Example: Potential Details to include on the Site Drawing(s)

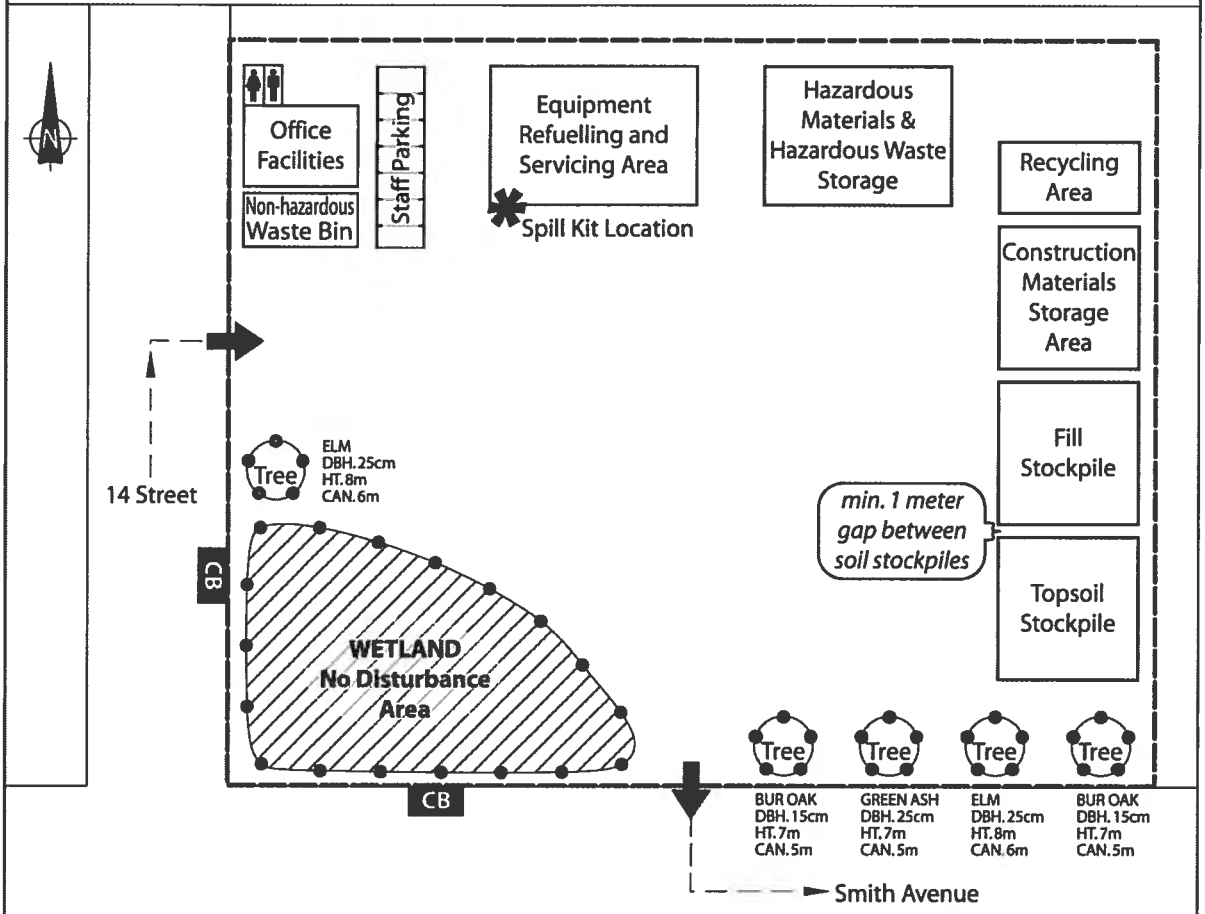
Site Location	Site Set-up and Layout	Erosion and Sediment Controls	Environmental Sensitivities
• Site location (e.g., municipal address; legal land description) • Site size • Project boundaries • Municipal boundaries, historic sites, protected areas (e.g., parks), federal land • Linear and other transportation components (e.g., railways, roads)	• Access/egress points • Traffic routes • Temporary parking • Office • Toilets • Staging areas • Borrow areas • Stockpile locations • Refuelling areas • Recycling areas • Spill kits • Hazardous materials storage • Hazardous and non-hazardous waste storage	• Project-specific erosion and sediment controls as appropriate for the jurisdiction (see Step 3.4 and Table 3-4 for more details) • Storm water infrastructure	• Environmentally sensitive areas (e.g., wildlife and wildlife habitat; waterbodies such as wetlands, streams and creeks; vegetation such as trees and rare plants) • Buffers around sensitive areas • Trees to be protected (and the specific tree protection measures as appropriate for the jurisdiction; see Step 3.5 and Table 3-5 for more details) • Storm water discharge points • Monitoring wells • Contamination

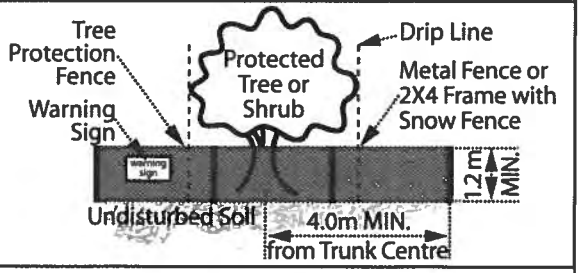
Annotated photographs can be included in this section. Super-imposing construction site set-up and operational details on aerial photographs of appropriate scale and nature is particularly informative.

See the sample site drawing on the following page.

Sample Site Drawing

1403 Smith Avenue Example Construction Project



LEGEND	TREE PROTECTION ZONE DETAIL (not to scale)
Access/Egress Points Panel Fence Delineated Site Boundary Snow Fence Delineated Boundary CB Catchbasin 1:1000 0 10 20 30 40 m	

NOTE

1. A minimum 1 meter gap shall be maintained between soil stockpiles unless a larger gap is specified in legislation that applies to your site.

Step 3 Potential Environmental Impacts & Controls

STEP 3		
	3.1 Permits, Approvals, Authorizations & Notifications	Compile the file name, number and environmental conditions and/or restrictions of all required project permits, approvals, authorizations and notifications. Append copies of all project permits, approvals, authorizations and notifications (and their applications, when referenced in the approval) to the ECO Plan.
	3.2 Regulatory Compliance	Describe regulatory, corporate policy and program requirements (additional to those listed in Step 3.1) that directly impact or restrict the construction project.
	3.3 Potential Environmental Impacts & Mitigation Strategies	Describe the potential environmental issues and impacts that may result from the construction activities. Provide procedures, controls or best management practices (BMPs) to prevent or reduce adverse impacts on the environment.
	3.4 Erosion & Sediment Control	Provide project-specific, jurisdiction-appropriate erosion and sediment controls.
	3.5 Municipal Tree Protection	Provide project-specific, jurisdiction-appropriate municipal tree protection measures.

3.1 Permits, Approvals, Authorizations & Notifications

In this section, list the file name and number of all required project permits, approvals, authorizations and notifications. Compile all of the environmental conditions and restrictions prescribed by regulatory agencies in those documents into a summary table.

Append copies of all project permits, approvals, authorizations and notifications (and the associated permit applications, when referenced in the approval) to the ECO Plan.

Provide the file number and title of all required project permits, approvals, authorizations and notifications and compile the environmental conditions and/or restrictions prescribed in those documents into a summary table (e.g., Table 3-1). If the approval references the permit application, also include the environmental conditions and/or restrictions described in that application in the summary table.

Append copies of all project permits, approvals, authorizations and notifications (as well as the associated permit applications, when relevant) to the ECO Plan.

The tender package will include many of the approvals. These approvals, along with any additional approvals needed for the project, must be identified in this section of the ECO Plan.

The Contractor, their staff and all sub-contractors must understand the current environmental legislation that governs their project as well as the environmental conditions and/or restrictions prescribed in permit conditions, approvals, authorizations and notifications.

Retain copies of project permits, approvals, authorizations and notifications (as well as the permit applications, when relevant) on site during all activities. Regulators may make site visits and inspections prior to, during and following construction.

Table 3-1 Example: Project Permits, Approvals, Authorizations & Notifications

Example Project Permit, Approval, Authorization or Notification File Number and Title	Construction Activity	Example Environmental Conditions and/or Mitigation Measure(s) *(as detailed in the permit, approval, authorization or notification OR its application)*
Fisheries & Oceans Canada Authorization CA-10-1249 Watercourse Crossings and Replacements — Tributary to Elbow River — Calgary	All	No in-stream work occurs May 1–July 15 and Sept 16–April 5
		Operate machinery on land in a manner that minimizes disturbance to the bed and banks of the watercourse
	Isolation and dewatering	Remove fish from the work area prior to dewatering and release alive immediately into a downstream staging area
	etc.	etc.
Alberta Environment & Parks Authorization 37/801 to Construct the Access Road Tie-in to the Canal Pathway with the WHS Right-of-Way	All	Within the canal ROW, minimize disturbance; no equipment is allowed outside the prescribed work area.
		Surface disturbance within the Department's canal ROW is permitted only during dry and/or frozen ground conditions.
		etc.
Notification under the Code of Practice for Watercourse Crossings (City of Calgary file number 2017WAXP712)	Post-Construction	The crossing site will be inspected at least once a year, during the snow-free season.
		A qualified aquatic environment specialist will design and conduct all monitoring.
		etc.
City of Calgary Drainage Permit HPZ0079	Site dewatering	The Permit Holder will notify The City of Calgary and all other required agencies if the results of water quality tests exceed specified limits.
		etc.

3.2 Regulatory Compliance

Describe specific regulatory requirements (additional to those covered in Step 3.1) as well as corporate policy and/or program requirements that directly impact or restrict the construction project.

The Contractor, their staff and all sub-contractors must understand and comply with all applicable regulatory requirements. In this section, describe specific regulatory requirements (other than permits, approvals, authorizations and notifications) as well as corporate policy and/or program requirements that directly impact or restrict this particular construction project (e.g., Table 3-2).

Table 3-2 Example: Project Regulatory Requirements (other than permits, approvals, authorizations and notifications)

Legislation	Construction Activity	Environmental Conditions
***Migratory Birds Convention Act* and its regulations**	All	Avoid engaging in potentially destructive or disruptive activities in key sensitive periods and locations, in order to reduce the risk of affecting migratory birds, their nests or eggs. Key sensitive periods include breeding and nesting (generally mid-March to late August in most parts of Canada), spring migration and fall migration. To determine the requirements for a specific project, consult with the Canadian Wildlife Service and provincial wildlife agencies.
		etc.
Alberta *Weed Control Act* and its regulations	All	A person shall control noxious weeds and destroy prohibited noxious weeds that are on land the person owns or occupies.
		Subject to the regulations, a person shall not use or move anything that, if used or moved, might spread a noxious weed or prohibited noxious weed.
		etc.
City of Calgary Community Standards Bylaw 5M2004		A Person shall not engage in any activity that is likely to allow smoke, dust or other airborne matter ... to escape the Premises without taking reasonable precautions to ensure that the smoke, dust or other airborne matter does not escape the Premises.
		etc.
City of Edmonton Corporate Tree Management Policy C456A	All	Contractors are responsible for the regular watering and maintenance of City trees while enclosed by tree protection hoarding.
		All equipment, soil, building materials and other debris shall be kept outside of the tree protection hoarding.
		etc.

3.3 Potential Environmental Impacts & Mitigation Strategies

In this section, describe the potential environmental issues and impacts that may result from the construction activities. Then summarize the procedures, controls and best management practices (BMPs) that this project will use to prevent or reduce adverse impacts on the environment.

An environmental impact is any change to the environment (positive or negative) resulting from the construction activities. For the purposes of the ECO Plan, negative impacts are the primary concern.

The Contractor should focus on the environmental impacts over which they have reasonable control. These potential issues and impacts will form the basis of the project-specific ECO Plan.

The review process for potential issues and impacts should consider normal operating conditions; shut-down and start-up conditions; and, any reasonably foreseeable emergency or abnormal situations. Further, ensure the review considers:

- potential releases of emissions to air (e.g., dust)
- potential releases to land (e.g., spills), surface water and groundwater
- potential to harm habitat or regulated species
- noise and light issues
- site waste management

Taking into account the environmental sensitivities, construction activities and regulatory requirements discussed in the previous sections, as well as any new sensitivities described in this section, provide a comprehensive summary of all the procedures, controls or best management practices that will be used to prevent or reduce adverse impacts on the environment.

Mitigation measures must be developed based on the Contractor's own site information, with reference to the consultant's Risk Assessment (for Alberta Transportation projects), and any relevant conditions contained within permits, approvals, authorizations and/or notifications. Include mitigation measures contained in the contract, including Standard General Conditions or Standard Specifications as applicable. Table 3-3 provides one method of summarizing potential environmental impacts and mitigation measures.

Table 3-3 Example: Potential Environmental Impacts and Mitigation Measures

Construction Activity	Potential Environmental Impact(s)	Environmental Mitigation Measure(s)
Earthworks	Erosion and compaction of soils Transport of sediment and associated contaminants by water and wind Sedimentation in infrastructure and waterbodies Loss of vegetation Damage to trees	Minimize the area of exposed soil by phasing stripping and grading work and/or ensuring timely implementation of suitable temporary or permanent soil stabilization measures Implement, inspect and maintain erosion and sediment controls Ensure traffic travels along pre-defined routes and within the confines of the working easements Install fencing around the drip lines of trees to protect the trees from vehicles and equipment
Refuelling and servicing of equipment	Hydrocarbon spills	Ensure spill kits are on all vehicles and workers are trained in their use Designate refuelling areas appropriate distances from waterbodies
Ground Disturbance	Unexpected discovery of historic contamination	Ensure that workers are trained to recognize the signs of possible contamination (e.g., drums and containers; stained or discoloured earth in contrast with adjoining soil) and immediately report them to the appropriate regulatory authorities
In-stream activity	Release of hydraulic fluid	Machinery for in-stream use will utilize vegetable-based hydraulic oil
Site Maintenance	Disturbance of vegetation Establishment of weed species	Equipment moving from areas with non-native species onto natural areas must be clean and free of weeds Weed control will occur during active construction Disturbed areas will be immediately re-seeded and/or re-vegetated with approved species

3.4 Erosion & Sediment Control

Provide project-specific erosion and sediment controls that are appropriate for the jurisdiction.

Alberta Transportation, and The Cities of Calgary and Edmonton require Erosion and Sediment Control Reports and Drawings on construction projects; however, each jurisdiction has its own specific requirements (see Table 3-4).

Erosion and sedimentation are significant environmental concerns on construction projects. The Contractor must implement, inspect and maintain appropriate erosion and sediment control measures for the contract term.

Table 3-4 Erosion and Sediment Control Requirements by Jurisdiction

Alberta Transportation and The City of Edmonton Requirements
In the ECO Plan, descriptions and drawings of erosion and sediment control are required. Items that should be in the ECO Plan include but are not limited to: • Text demonstrating the use of appropriate methods and materials and a corresponding drawing indicating the locations of erosion and sediment control near waterbodies. Erosion and sediment control measures should be included on the site drawing (Step 2.3). • Documentation that shall be utilized by appointed staff for the monitoring of sediment and erosion control for the project site. The Contractor must ensure erosion and sediment control devices are in place and maintained during the contract term. For Alberta Transportation projects refer to the *Alberta Transportation Erosion and Sediment Control Manual* (available at www.transportation.alberta.ca). For City of Edmonton projects, refer to *The City of Edmonton Erosion and Sedimentation Control Guidelines* (available at www.edmonton.ca) for specific guidance.
The City of Calgary Requirements
City of Calgary projects that require an ECO Plan also require a separate Erosion and Sediment Control Report and/or Drawing(s) to be developed. The documents are to be reviewed, signed and stamped by a professional with experience in the design and implementation of erosion and sediment control who is a professional engineer (P.Eng.), professional licensee (P.L.(Eng.)) or professional agrologist (P.Ag.), or who holds a designation as a Certified Professional in Erosion and Sediment Control. In the ECO Plan, indicate whether an Erosion and Sediment Control Report and/or Drawing was developed for the project. Include a complete citation for all Reports and Drawings submitted (i.e., Author, Full Title, Publication Date, Date submitted to The City of Calgary, the Business Unit [and contact person] that the Report and/or Drawing was submitted to, and the mode used to transmit the documents [e.g., email, fax, registered mail]). The ECO Plan and the separate Erosion and Sediment Control Report and/or Drawing(s) must be submitted together to The City of Calgary Project Manager. The City of Calgary Environmental & Safety Management will review the ECO Plan, and The City of Calgary Water Resources will review the Erosion and Sediment Control Report and/or Drawing(s). For more information on submission requirements, refer to the current edition of *The City of Calgary Guidelines for Erosion and Sediment Control* (available at www.calgary.ca) or contact The City of Calgary Water Resources — Erosion and Sediment Control by phone at 3-1-1 (local Calgary calls only) or (403) 268-CITY (for callers outside Calgary). The ECO Plan does not replace an Erosion and Sediment Control Report and/or Drawing(s).

3.5 Municipal Tree Protection

Provide project-specific municipal tree protection measures that are appropriate for the jurisdiction.

Construction work on, near or crossing City property can damage City-owned trees. Ninety-nine percent of a tree's roots are found within one meter of the soil surface and processes like moving heavy equipment near trees, changing the soil structure, paving over roots, breaking branches, scraping bark and excavating in the root zone can damage and even kill trees.

The Cities of Calgary and Edmonton both have municipal tree protection standards for construction projects; Table 3-5 summarizes their specific requirements.

Tree Protection Plans outline how construction work will be accomplished while protecting public trees. Tree Protection Plans are required for any development involving the following: excavation, storage of construction materials, or access routes for people and/or equipment within a certain distance of a City-owned tree. The Contractor must develop Tree Protection Plans, when needed, for their projects, and ensure that tree protection measures are in place and maintained during the contract term.

Please note that Tree Protection Plans are intended to protect only the trees themselves; trees with specific wildlife values (e.g., nesting or fledging birds, riparian habitat) may have additional regulatory requirements that apply to the project.

Table 3-5 Tree Protection Requirements by Municipal Jurisdiction

The City of Edmonton Requirements
Prior to the start of construction, City of Edmonton urban foresters must be notified of any construction work planned within five meters of a City-owned tree. City of Edmonton tree protection is mandated by the Corporate Tree Management Policy C456A and the Community Standards Bylaw 14600. In the ECO Plan, include a copy of the Tree Protection Plan developed for the project and summarize the required tree protection measures. The location of all City trees and associated tree protection measures should be included on the ECO Plan site drawing (Step 2.3). The City of Edmonton urban foresters will work with you to develop tree protection solutions and to reduce potential damage costs to your project. For more information or to inquire about tree ownership, call 3-1-1 (in Edmonton) or (780) 442-5311 (outside Edmonton), or email citytrees@edmonton.ca.

Table 3-5 Tree Protection Requirements by Jurisdiction (*cont'd*)

The City of Calgary Requirements
City of Calgary projects require a *Tree Protection Plan* and a *Tree Protection Plan Agreement* when construction or construction-related activities are to occur within six meters of a public tree. Public trees, including trees growing in parks, natural areas, boulevards and road right-of-ways, are City of Calgary property. The protection of public trees is mandated by municipal bylaws, including the Tree Protection Bylaw 23M2002 and the Street Bylaw 20M88. In the ECO Plan, indicate whether a Tree Protection Plan is required for the project and summarize the required tree protection measures. Please submit a copy of all Tree Protection Plan(s) and Agreement(s) required by the project and the ECO Plan together to The City of Calgary Project Manager. The City of Calgary Environmental & Safety Management will review the ECO Plan, and The City of Calgary Parks — Urban Forestry will review the Tree Protection Plan(s) and Agreement(s). Note that the location of all City trees and associated tree protection measures should be included on the ECO Plan site drawing (Step 2.3). For more information on Tree Protection Plans or to inquire about tree ownership, contact The City of Calgary Parks — Urban Forestry by phone at 3-1-1 (local Calgary calls only) or (403) 268-CITY (for callers outside Calgary). The ECO Plan does not replace a Tree Protection Plan.

Step 4 Hazardous Materials & Waste Management

STEP 4		
	4.1 Hazardous Materials	List every hazardous material to be used or stored on site by the Contractor and all sub-contractors. Describe specific handling, containment, storage and disposal methods for each hazardous material.
	4.2 Waste Management	List all anticipated hazardous and non-hazardous waste materials along with proper handling and disposal methods. As well, provide all additional jurisdiction-specific handling procedures.

4.1 Hazardous Materials

List every hazardous material to be used or stored on site by the Contractor and all sub-contractors. Describe specific handling, containment, storage and disposal methods for each hazardous material.

Hazardous materials are commonly used on construction sites. In this section, consider all the hazardous materials that will be used in the construction project and by the construction equipment (see Step 1.2). For example, be sure to include hazardous materials that will be required for equipment cleaning, maintenance and operations (e.g., diesel, propane, oil, lubricant, hydraulic fluid, antifreeze) as well as materials required for the project itself (e.g., caulking, paint, solvent, glue, pesticide).

The ECO Plan must identify every hazardous material to be used or stored on site by the Contractor and all sub-contractors, along with material-specific handling, containment, storage and disposal procedures (see example Table 4-1). These procedures must comply with all regulatory requirements; for example, materials must be stored specific distances back from waterbodies and storm sewers. The storage location(s) of hazardous materials must also be marked on the site drawing (Step 2.3).

The Contractor must keep all hazardous waste disposal receipts and manifests and maintain copies on site. The Cities of Edmonton and Calgary have additional hazardous waste management requirements; these are presented in Step 4.2.

Table 4-1 Example: Hazardous Materials and Associated Handling Procedures

Hazardous Material	User	Storage Location	Containment	Handling Procedure	Reuse, Recycling and/or Disposal Method
Diesel	Contractor, sub-contractor	Refuelling station (see Site Drawing, Step 2.3)	Double-walled fuel tank located on impervious tray with capacity to hold 110% of stored liquid volume. Concrete barriers, fire extinguisher and no smoking sign erected.	On-site fuelling will follow best management practice XYZ described in Step 3.3 and provided in Appendix A.	Fuel tank will be reused on subsequent projects.
Lubricating Oil	Contractor	Storage locker in laydown area (see Site Drawing, Step 2.3)	Fire-proof containment locker. All lubricating oil packaging clearly labelled with Contractor's name.	When lubricating oil is used, Contractor will provide secondary containment with capacity to hold 110% of stored liquid volume.	Storage locker(s) will be reused on subsequent projects.

4.2 Waste Management

List all anticipated hazardous and non-hazardous waste materials along with proper handling and disposal methods. Provide all additional jurisdiction-specific handling procedures.

Construction projects generate waste materials; these materials fall into two broad categories, as follows:

- waste generated as part of the contract deliverable (e.g., concrete and wood demolition waste)
- waste generated by the Contactor's activities, such as oil filters, oils, plastic, cardboard, paints, solvents, spill clean-up materials and sewage

The ECO Plan must identify every hazardous and non-hazardous waste product to be produced by the project, and specify its appropriate handling and disposal procedure (see example Table 4-2). These procedures must comply with applicable regulatory requirements. The Contractor must keep all hazardous and non-hazardous waste disposal receipts and manifests. All waste storage locations must be shown on the site drawing (Step 2.3).

Contractors shall reuse or recycle their hazardous and non-hazardous waste materials when possible. The Cities of Calgary and Edmonton have specific additional landfill diversion and recycling requirements (see Table 4-3, next page). When evaluating recycling options, contractors may wish to consult Alberta's Recycling Hotline (www.recyclinghotline.ca; 1-800-463-6326); this tool allows users to match a wide range of waste materials with suitable local recycling depots.

Table 4-2 Example: Waste Material Handling and Disposal Procedures

Waste Material	Handling Procedure	Reuse, Recycling and/or Disposal Method
Non-Hazardous Waste Materials		
Concrete	Break up and put in concrete bin	Recycle (*provide Recycling Company name & location*)
Wood	Stack reusable boards next to supply of new form boards for reuse; recycle clean unusable forms in wood recycling bin	Scraps used for formwork, remaining recycled (*provide Recycling Company name & location*)
Road Asphalt	Truck directly to vendor as asphalt is stripped/removed	Recycle (*provide Recycling Company name & location*)
Drywall	Truck directly to vendor as drywall is removed	Recycle (*provide Recycling Company name & location*)
Paper & Cardboard	Bundle (if needed) and put in covered paper and cardboard recycling bins	Minimize on-site paper use; when needed, print double-sided and black & white (if possible); then Recycle (*provide Recycling Company names & locations*)
Clear Plastic Film	Bundle and put in covered plastic bin	Recycle (*provide Recycling Company name & location*)
Hazardous Waste Materials		
Epoxy	Stockpiled separately	Container returned to distributor
Concrete washout	All washout contained in a designated lined area or in a self-contained concrete washout system	Recycle (*provide Recycling Company name*)

The Cities of Calgary and Edmonton both have additional waste management requirements for construction projects. These are detailed in Table 4-3.

Table 4-3 Waste Management Requirements by Municipal Jurisdiction

The City of Edmonton Requirements
When working for The City of Edmonton, hazardous waste handling procedures must be included in the ECO Plan. Hazardous waste manifest or recycle dockets must be completed and appropriate copies maintained on site or by the generator when disposing hazardous waste or hazardous recyclables. The Contractor must identify all waste streams and disposal methods (i.e., diverted from the landfill, recycled or land-filled). Contractors shall document / recycle / divert materials as per their contractual agreement. Table 4-2 provides an example of how to summarize the project's waste management.
The City of Calgary Requirements
When working for The City of Calgary, the Contractor must identify how waste will be reduced and diverted from the landfill or recycled. At a minimum, the Contractor will recycle cardboard, paper, recyclable wood, drywall, asphalt (both road asphalt and asphalt shingles), concrete, brick and masonry block, scrap metals and clear plastic film (polyethylene) *or* provide written justification for not diverting any of these waste streams. Table 4-2 provides an example of how to summarize this component of project waste management. The City of Calgary is tracking its quantities of re-used, recycled and landfilled waste associated with capital construction projects. The City of Calgary requests that contractors use form TS 5377 (Construction Waste Diversion & Disposal Report; Internet Explorer required) to summarize their waste disposal and diversion activities. Contractors are also required to retain and submit copies of all waste disposal and diversion records (e.g., bills of lading, waybills, weigh slips, waste manifests, tipping receipts, waste disposal receipts) for materials disposed and those recycled or reused. Completed Form TS 5377 together with all associated waste disposal and diversion receipts must be submitted within two weeks of disposal or diversion to the following email: ECOPlan.waste@calgary.ca.

Step 5 ECO Plan Implementation

STEP 5		
	5.1 On-Site Representative	Provide the name(s) and contact details for the Contractor's On-Site Representative(s).
	5.2 Training & Communication	Detail the procedures that will be used to train staff and sub-contractors in their ECO Plan responsibilities.
	5.3 Monitoring & Reporting	Describe monitoring and inspection procedures that suit the nature and scale of the project and meet regulatory and contractual requirements.
	5.4 Documentation	Describe the environmental information and ECO Plan records that will be kept in up-to-date hard copies on the project site.
	5.5 ECO Plan Update	Provide ECO Plan review and update procedures. Append a current ECO Plan Revision Summary table (e.g., Table 5-3) to all updated ECO Plans.

5.1 Contractor's On-Site Representative

Provide the name(s) and contact details for the Contractor's On-Site Representative(s).

The Contractor must identify an on-site individual to be their On-Site Representative; this individual is responsible for maintaining the environmental controls and addressing any environmental issues or questions that arise. The Contractor must identify their On-Site Representative on the ECO Plan Checklist and at the pre-construction meeting.

In this section, provide the name(s) and full contact details for the Contractor's On-Site Representative.

5.2 Training & Communication

Detail the procedures that will be used to train staff and sub-contractors in their ECO Plan responsibilities.

The Contractor must ensure that their workers are aware of applicable environmental legislation and project-specific requirements before construction starts. Anyone on a construction site could negatively impact the environment. To ensure environmental protection, it is essential to train all staff (including sub-contractors) in their specific environmental responsibilities.

ECO Plans must be included as a topic in site orientations, pre-construction meetings and regular site meetings. Minutes of these meetings must be retained and available upon request. Topics for training and awareness sessions may include (but are not limited to) those listed in Table 5-1.

Table 5-1 Potential Topics for ECO Plan Training and Awareness Sessions

ECO Plan Training and Awareness — Potential Topics
ECO Plan Content & On-site Location
ECO Plan Team Roles & Responsibilities
Locations of Environmental Restrictions (e.g., wetlands, rare plants, bird nests, riparian areas)
Requirements of Project Permits, Approvals, Authorizations & Notifications
Regulatory, Policy & Program Compliance Measures
Potential Environmental Impacts, Mitigation Measures & Best Management Practices
Erosion & Sediment Control
Municipal Tree Protection
Hazardous Materials & Waste Management
Monitoring & Reporting Procedures
Environmental Emergency Response Procedures (including locations of spill kits, contact information, etc.)

5.3 Monitoring & Reporting

Provide monitoring and inspection procedures that suit the nature and scale of the project, and that satisfy regulatory and contractual requirements.

The Contractor will develop monitoring and inspection procedures that satisfy the contract terms and conditions and all regulatory requirements. The monitoring and inspection procedures must also be appropriate for the nature and scale of the project, as well as the site characteristics, work activities and potential environmental risks associated with the project.

The Contractor is responsible for understanding and complying with the reporting requirements, and ensuring that all of the environmental controls are working.

The Contractor must include the following project-specific information in this section:

- locations and items to be inspected
- monitoring frequency
- monitoring during scheduled shut-downs
- reporting requirements related to permits, approvals, authorizations and notifications

Deficiencies identified during monitoring activities must be immediately addressed.

5.4 Documentation

Describe the environmental information and ECO Plan records that will be kept in up-to-date hard copies on the project site. These documents must always be available for inspection or review.

A master hard copy of documents relating to the ECO Plan and the project's environmental activities must be retained at the construction site and available for inspection at all times. These documents must be kept current and be available to all personnel. Table 5-2 provides a non-comprehensive list of the types of documents that should be maintained as up-to-date hard copies on the project site.

Table 5-2 Example Types of Documentation to be Retained on the Project Site in Hard Copy

Example — Hard Copy Documentation to be Retained on the Project Site
Current ECO Plan
Current Erosion and Sediment Control Report and/or Drawing(s)
Current Municipal Tree Protection Plan
Regulatory Permits, Approvals, Authorizations and/or Notifications, as well as their applications when relevant (often the application forms part of the approval)
Record of Environmental Incidents (e.g., spill and release records)
Hazardous Materials Inventory
Hazardous and Non-Hazardous Waste Materials Inventory
Completed Environmental Monitoring Records
Site Orientation, Tailgate Meeting and Project Progress Minutes
Construction Equipment Inspection Logs (to ensure that the equipment is inspected before coming on site be certain that the equipment is, for example, weed-free and/or leak-free)
Fuelling Logs
Relevant Memos Relating to Environmental Matters

5.5 ECO Plan Update

In this section, provide ECO Plan review and update procedures; include a list of people who will be contacted when the ECO Plan changes.

If an update to the ECO Plan is required, attach a completed revision summary table (such as Table 5-3) to all subsequent versions of the document.

In this section, provide ECO Plan update procedures; include a circulation list for updated ECO Plans. ECO Plan updates are generally required in two circumstances:

- when an ECO Plan is deficient and returned to the Contractor for revision prior to the start of construction
- when the project, its site conditions and/or its activities change in a way not anticipated in the original ECO Plan

If an ECO Plan is determined to be deficient at the review stage, the Contractor must modify and complete it to the mutual satisfaction of all parties. No work may begin until all parties have agreed to the ECO Plan.

ECO Plans must be updated when the project, its site conditions and/or its activities change in a way not anticipated in the original document. ECO Plans must provide details to continually meet environmental requirements and proactively protect the environment. For example, in the case of an unplanned winter shut-down, the ECO Plan must be revised to include the procedures and environmental protection measures required for the shut-down period.

Once the ECO Plan is updated, the Contractor is responsible for notifying (as appropriate) Alberta Transportation, The City of Calgary and/or The City of Edmonton of the changes prior to implementation. The Contractor shall communicate the changes to employees and relevant sub-contractors, and provide the necessary training before implementing the changes. Modifications to the ECO Plan must provide an equal or better level of avoidance or mitigation.

All changes to the ECO Plan must be documented (include a revision summary table such as Table 5-3). Clearly summarize what the changes are and where they are located in the document, referencing applicable sections, pages, drawings and/or table numbers. This revision summary table should be located at the front of the revised ECO Plan (just after the cover page). Forward the revised ECO Plan to the reviewer (i.e., The City of Calgary, The City of Edmonton or the consultant for Alberta Transportation projects) and other applicable parties.

Table 5-3 Example: ECO Plan Revision Summary Table

Date	ECO Plan Section	Specific Document Reference (Page #, Drawing # or Table #)	Description of Change
25 Jun 2017	2.2	Page 4	Modify Step 2.2 to add "Environmental Site Information Reports (i.e., Phase II ESA, remediation reports)" to the list of documents to be reviewed.
	2.3	Drawing 2-3	Add Spill Kit location to Site Drawing 2-3.
	5.3	Page 25	Modify Table 5-16 to add "Fisheries and Oceans Canada" to the list of regulatory agencies that will be contacted.
28 Aug 2017	6.1	Page 32	In paragraph 5, change the words, "investigate the release", to the words "review details of the release".

Step 6 Environmental Emergency Procedures

STEP 6	6.1 Environmental Emergency Prevention & Response	Identify potential incidents that may impact the environment and provide appropriate prevention and emergency response procedures. Provide a current emergency contact list and describe where it will be posted on site.

6.1 Environmental Emergency Prevention & Response

In this section, identify project-related potential incidents that may impact the environment, and provide details or copies of prevention and emergency response procedures. In addition, provide a current emergency contact list and describe where it will be posted on site.

The ECO Plan must identify potential project-related incidents that may impact the environment. These incidents could be the result of natural events, accidents, human error or improper work practices.

Examples of potential incidents include:

- contaminant spills and releases to land, water and air from fuels, oils, lubricants and chemicals
- discovery of historic contamination
- erosion events of land (e.g., water, wind), watercourses (e.g., bank erosion, flooding), berms and coffer dams

The ECO Plan must provide emergency procedures to prevent and respond to potential incidents that may impact the environment. The emergency response procedures must include:

- training provisions to make Contractor staff and sub-contractors aware of their responsibilities during emergency situations
- a list of equipment and materials available on site including their specific location

APPENDIX B

TABLE OF CONTENTS

PART 1 - MAJOR PAVING LOCATIONS AND ADJACENT CONCRETE

The following information package is intended to provide a detailed description of the type and location of the asphalt and concrete work along roadways, included as part of the 2025 Street Improvement Program. Attached are maps denoting the work locations around town. The work is split into regions for ease of reference: Valley to the north and Hilltop to the south. The work is summarized in Table B.1.1.

Table B1.1 Major Paving Locations and Adjacent Concrete

	No.	Location	Paving Quantity	Concrete Quantities
VALLEY	1	Dahl Drive 52 Ave to 55 Ave	4570 m^2	
	2	52 Ave Tim Horton's Intersection	578m^2	
	3	49 Ave and 47 St	960m^2	
HILLTOP	4	Whitecourt Avenue & McLeod Drive	1100 m^2 1 Back alley Apron	20 l.m. mono rf sidewalk 3 para ramps 21 l.m. swale
	5	Sunset Boulevard & Feero Drive + Sunset Boulevard & Baxter Crescent	2250 m^2 2 Back alley Aprons	15 l.m. mono rf sidewalk 6 para ramps 41 l.m. swale
	6	Sunset Boulevard & 42 Ave (Traffic Circle)	435m^2	10 l.m. Curb and Gutter

For each of the above locations, the asphalt work includes Cold Milling, tack coat, and 50mm Asphalt ACO Overlay, unless otherwise indicated. All noted concrete sidewalks, swales, catch basins, and para ramps adjacent to the roadway must also be completed.

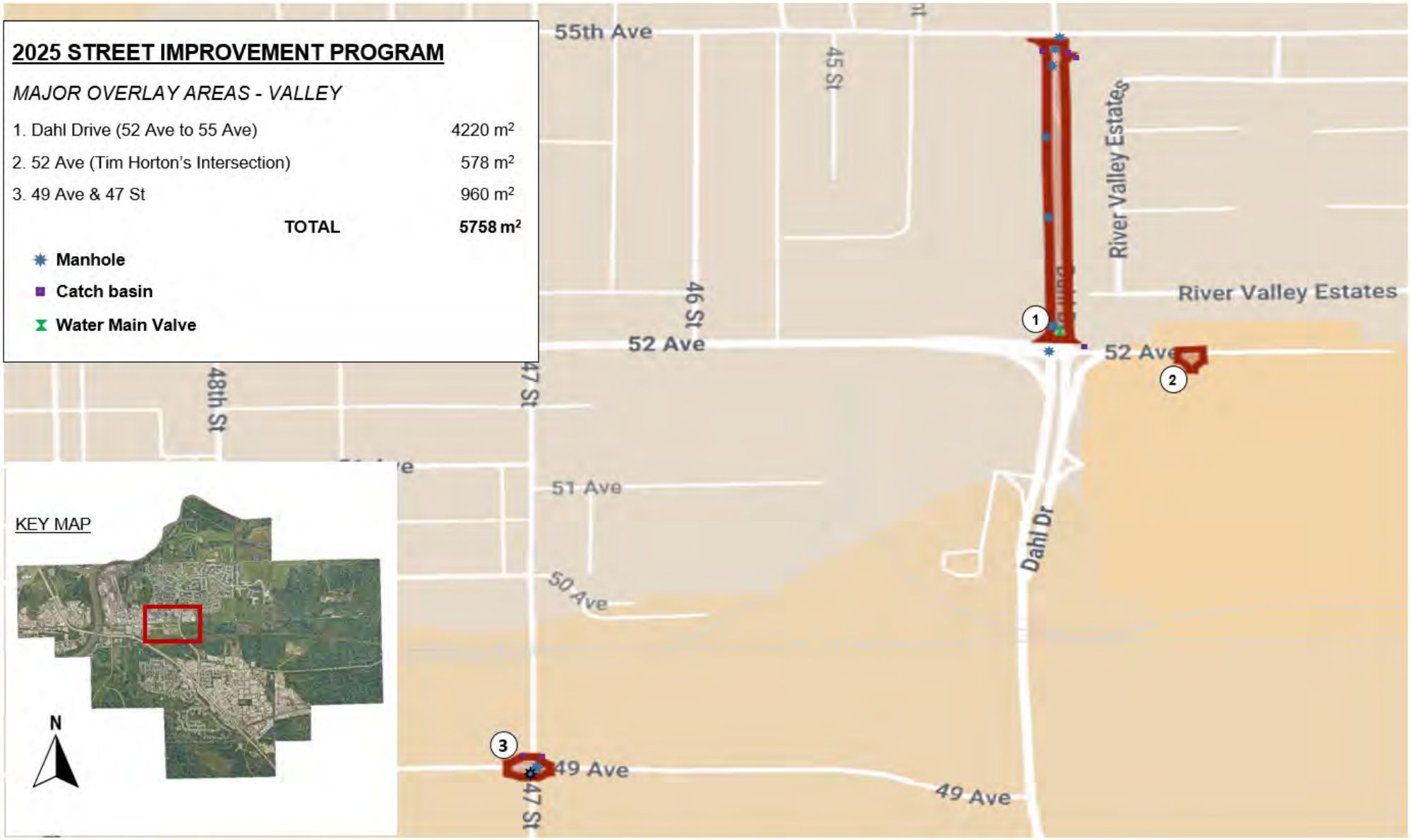
Concrete work must immediately be followed by asphalt milling and paving, within a maximum of 1 week from concrete completion. Similarly, milling must be immediately followed by paving, within a maximum of 1 week.

Where there are back alleys joining to a paved section, the first 6 m of the back alley must be paved to reduce gravel spreading to the roadway. The typical width of back alley is 6 m. Back alley Aprons shall be paid on a per-unit basis, based on the typical dimensions.

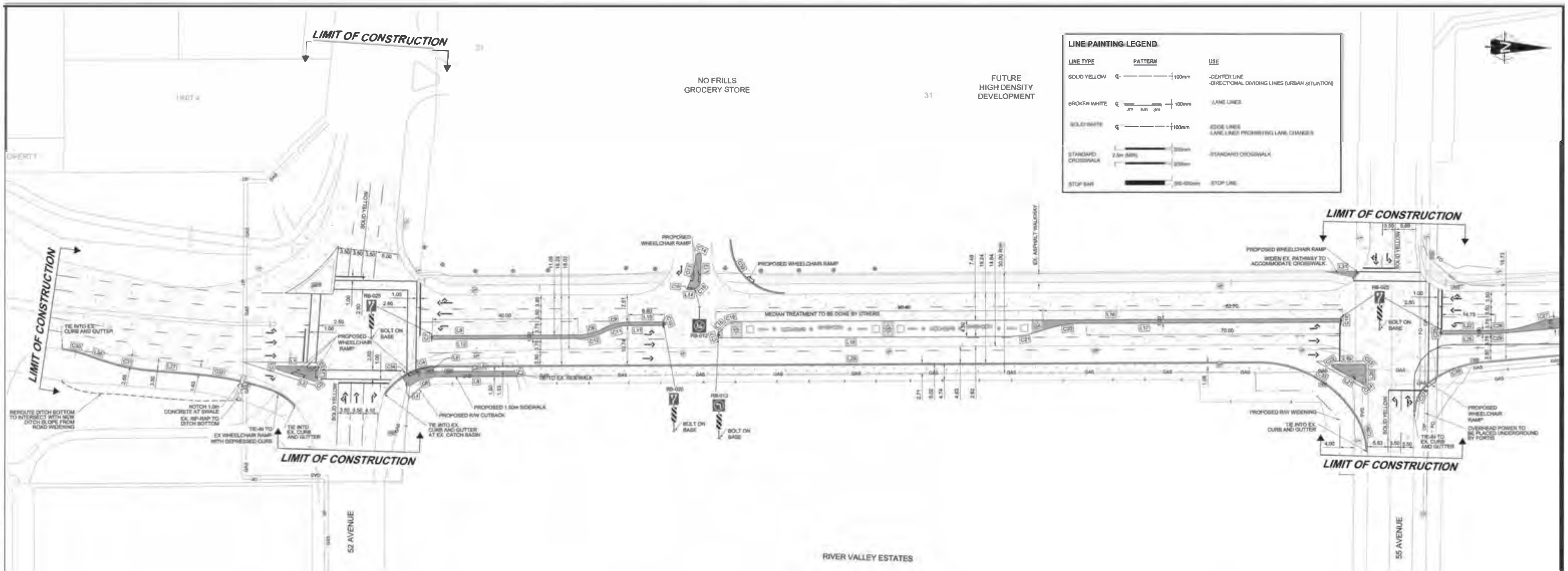
1.1 MILLINGS HAULING AND PRIME COAT

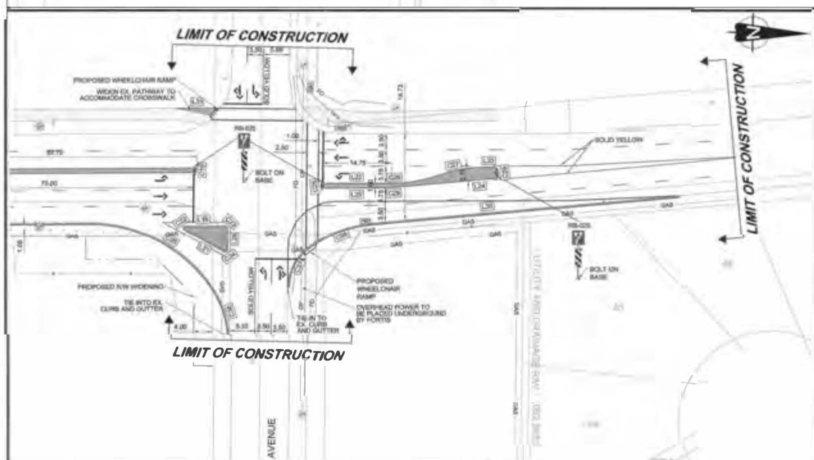
Millings from the overlay areas are the property of the Town of Whitecourt. As part of the contract, the millings are to be transported to a location specified by the Town. Hauling locations may include 47 Street North of Flats Road, or Blue Ridge Road. Other locations may also be included, depending on the volume of usable millings. Millings shall be compacted and spread by Town Staff, however prime coat shall be applied by the Contractor once the millings are in place.

Please see following pages 4 to 9 for maps of major paving locations and adjacent concrete, Dahl Dr Line and Curve Painting Schematic, and 2025 Intersection Drainage Design


2025 STREET IMPROVEMENT PROGRAM
MAJOR OVERLAY AREAS - VALLEY
1. Dahl Drive (52 Ave to 55 Ave) 4220 m²
2. 52 Ave (Tim Horton's Intersection) 578 m²
3. 49 Ave & 47 St 960 m²
TOTAL 5758 m²
Manhole
Catch basin
Water Main Valve
KEY MAP
N
55th Ave
45 St
River Valley Estates
River Valley Estates
46 St
52 Ave
52 Ave
48th St
47 St
51 Ave
Dahl Dr
50 Ave
49 Ave
49 Ave
47 St
1
2
3

2025 STREET IMPROVEMENT PROGRAM MAJOR PAVING AREAS, HILLTOP





LINE TABLE		
LINE NO	LENGTH	DIRECTION
L1	10.41m	S0° 58' 36.74"E
L2	3.00m	N88° 38' 32.46"W
L3	11.03m	N16° 14' 49.18"E
L4	3.31m	S50° 37' 10.14"W
L5	1.58m	N75° 15' 30.84"E
L6	22.32m	N1° 55' 58.05"W
L7	1.67m	N70° 40' 31.31"E
L8	22.28m	S1° 55' 52.71"E
L9	40.00m	N1° 55' 51.96"W
L10	9.76m	N1° 55' 55.16"W
L11	9.76m	S1° 55' 46.80"E
L12	40.80m	S1° 55' 51.96"E
L13	8.99m	S89° 51' 08.04"W
L14	0.84m	N0° 35' 22.91"E
L15	2.48m	N47° 51' 42.39"W
L16	188.80m	N1° 55' 53.62"W
L17	69.99m	S1° 55' 52.05"E
L18	79.96m	S1° 55' 48.11"E
L19	8.68m	S1° 55' 52.05"E
L20	4.88m	S88° 57' 05.19"W
L21	8.87m	N27° 22' 53.33"E
L22	14.79m	S1° 43' 13.46"E
L23	1.73m	S1° 43' 14.32"E
L24	19.38m	N6° 45' 42.89"W
L25	10.67m	N1° 53' 23.51"W

LINE TABLE		
LINE NO.	LENGTH	DIRECTION
L26	5.34m	N17° 33' 29.65"E
L27	12.92m	N3° 01' 34.72"E
L29	228.36m	N1° 55' 52.05"W
L30	25.86m	86° 44' 50.09"E
L31	9.88m	N2° 07' 00.21"W

CURVE TABLE					
CURVE NO.	LENGTH	RADIUS	DELTA	CHORD DIRECTION	CHORD LENGTH
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C26	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

CURVE TABLE					
CURVE NO.	LENGTH	RADIUS	DELTA	CHORD DIRECTION	CHORD LENGTH
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C30	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
C31	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
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C35	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
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C39	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

LEGEND — PROPOSED / EXISTING: WATER MAIN, STORM SEWER, SANITARY MANHOLE, STORM MANHOLE, VALVE, CATCH BASIN, SIGN, LIGHT STANDARD TO BE INSTALLED BY OTHERS, ELEVATION, TREE, GAS LINE, OVERHEAD POWERLINE, FENCELINE, EXISTING WALKWAY, PROPOSED MEDIANS/ISLAND/WALKWAY, PROPOSED ROAD WIDENING, PROPOSED ASPHALT OVERLAY, PROPOSED STRAIGHT FACE C&G, CATCH BASIN, SIGN, EX LIGHT STANDARD TO BE REMOVED BY OTHERS, LIGHT STANDARD

PERMIT TO PRACTICE
DCL SIEMENS ENGINEERING LTD.
Signature
Date 2014/06/25
PERMIT NUMBER: P 3753
The Association of Professional Engineers, Geologists and Geophysicists of Alberta

No.	DATE	DESCRIPTION	BY
6			
5			
4	2013-11-19	CLIENT REVIEW OPTION 5	CCL
3	2013-07-18	CLIENT REVIEW OPTION 4	CCL
2	2013-06-27	CLIENT REVIEW OPTION 3	CCL
1	2013-05-30	CLIENT REVIEW OPTION 1 & 2	CCL

REVISION

COMPANY CONFIDENTIAL

No.	DATE	DESCRIPTION	BY	APP'D
12				
11				
10				
9	2014-06-25	FOR CONSTRUCTION	VL	MD
8	2014-04-04	FOR TENDER	YT	CCL
7	2014-03-14	90% REVIEW	YT	CCL

ISSUE

PROJECT No.	122-13-16
DRAWN BY	CCL / VL
DESIGNED BY	CCL
CHECKED BY	KF
SCALE	1:500

DCL SIEMENS
DCL SIEMENS ENGINEERING LTD.
CIVIL & MUNICIPAL ENGINEERS
101, 10630-172 Street Edmonton, AB T5S 1H8
Phone (780) 486-2000 www.dclsiemens.com

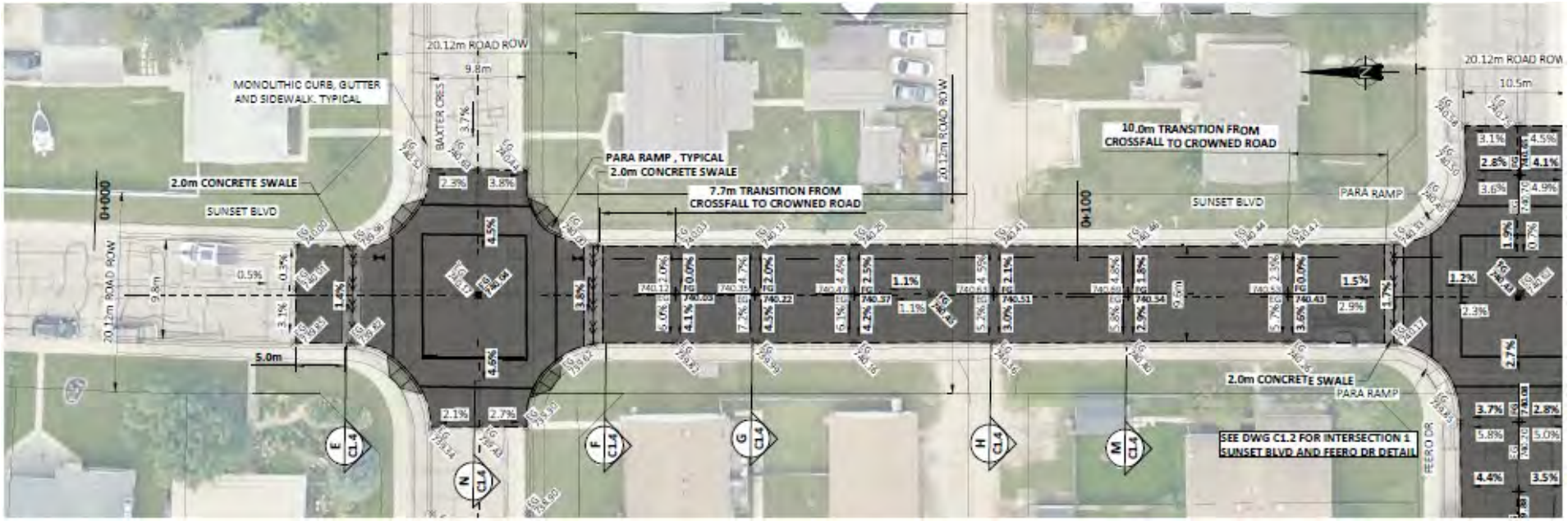
TOWN OF WHITECOURT
DAHL DRIVE
REALIGNMENT, WIDENING & SIGNALS

LINE AND CURVE TABLE
SIGNS AND LINE PAINTING

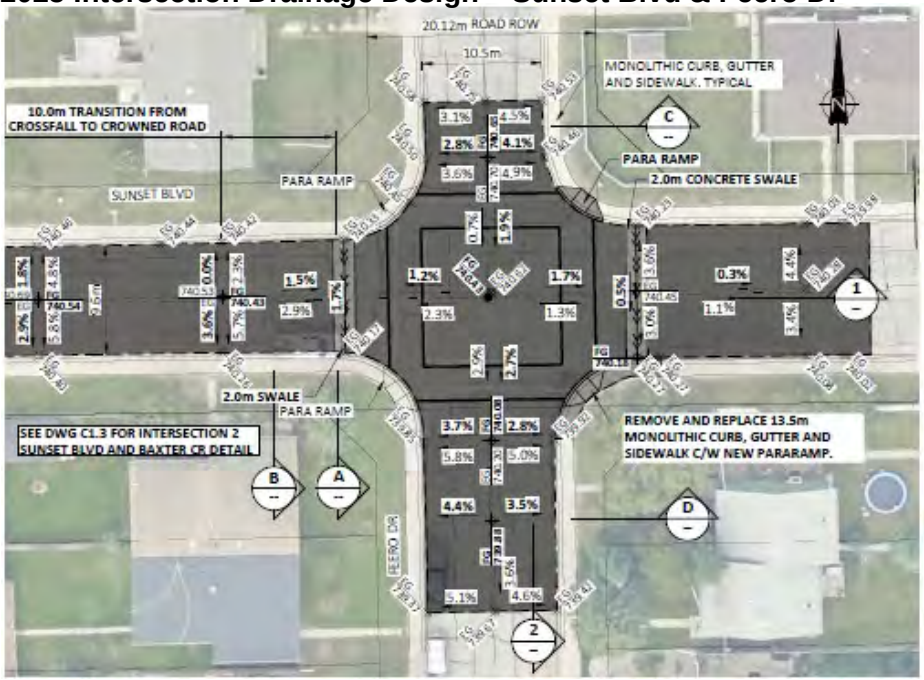
DRAWING No. C-03

2025 Intersection Drainage Design – Project Area

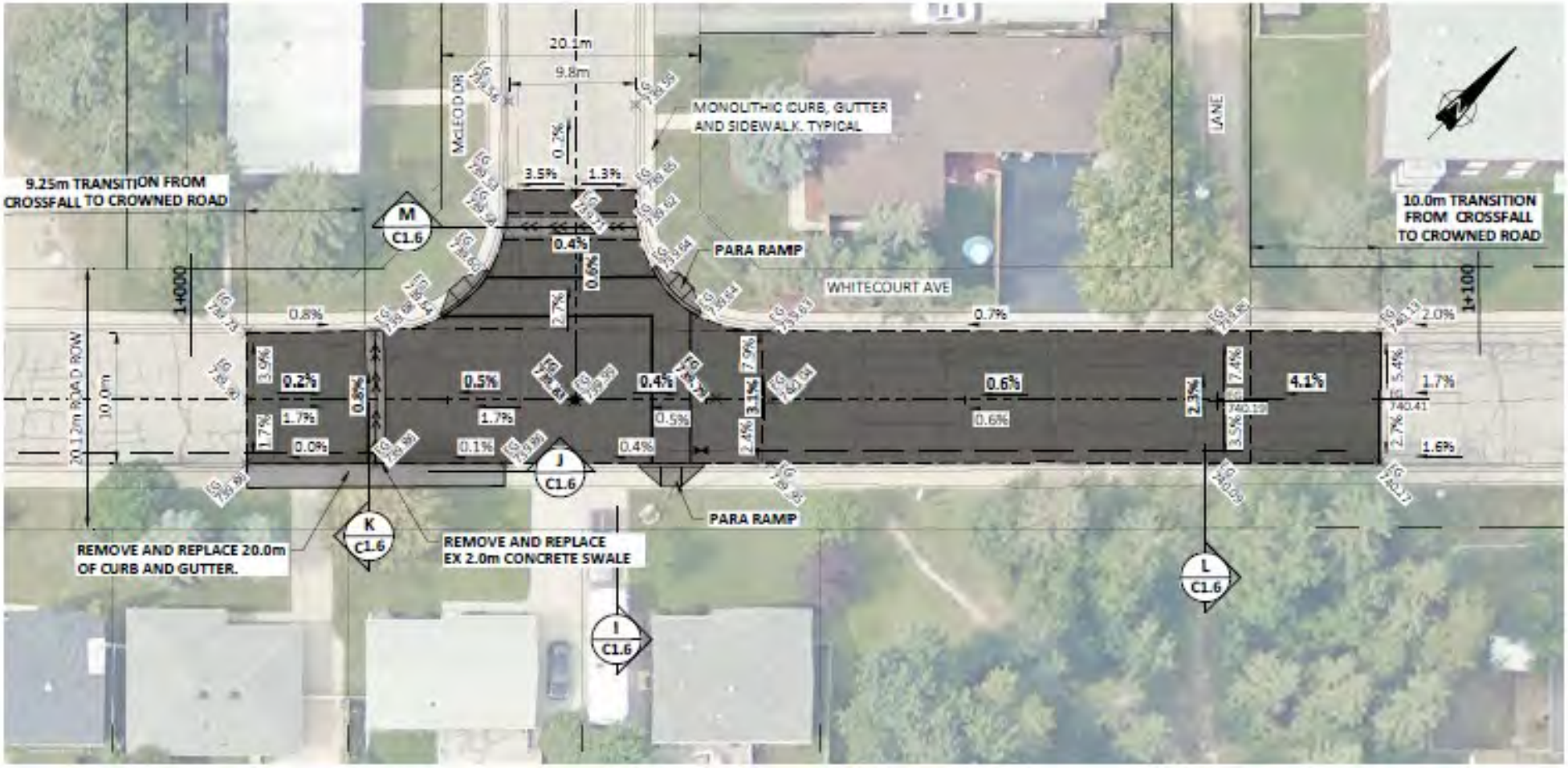
2025 Intersection Drainage Design – Sunset Blvd & Baxter Crescent East to Feero Dr



2025 Intersection Drainage Design – Sunset Blvd & Feero Dr



2025 Intersection Drainage Design – Whitecourt Ave & McLeod Dr



PART 2 - ROADWAY PATCHING

The following is intended to provide a detailed description of the type and location of any miscellaneous asphalt patching and miscellaneous paving, included as part of the 2025 Street Improvement Program. Attached is an overall map of the Hilltop and Valley areas, denoting the work. The work is summarized in Table B2.1.

Table B2.1 Localized Pavement Failure and Roadway Patching

		Location	Description	Approx. Area
VALLEY	1	19 Merrifield Pl	Adjust manhole to ensure it is flush with pavement surface	9 m^2
	2	52 Ave and 46 St	Water main valve adjustment, typical 3m x 3m	9 m^2
	3	50 Ave and 50 St	Adjust manhole to ensure it is flush with pavement surface, water valve adjustment, typical 3m x 3m	18m^2
	4	50 Ave and 51 St	Water main valve adjustment, typical 3m x 3m, Large pothole NW corner 3m x 3m	18 m^2
	5	53 St Truck Fill station	Sloped apron around new concrete pad	108m^2
	6	3419 37 Ave	Pavement patch around Hydrant, typical 3m x 3m	9m^2
HILLTOP	7	Park Dr and Park Court	Adjust manhole to ensure it is flush with pavement surface	9m^2
	8	37 Ave (Near Strad)	Pavement patch around Fire Hydrant	9m^2
West Whitecour				

Note: any manhole adjustments or back alley aprons adjacent to major paving areas are not quantified in the above table. They are shown in the maps, but not numbered to allow the maps to reflect the above table.

2.1 LOCALIZED PAVEMENT FAILURE – 50 MM DEPTH

While the Town of Whitecourt completes pot hole patching in-house, large depressions and roadway failures are beyond the current scope of the program. As such, Localized Pavement Failures shall be included in the 2025 Street Improvement Program. Localized Pavement Failures have a typical area of approximately 50 – 100 m^2 each. Included in the price is removal of the 50 mm cold milling (or similar) and 50 mm overlay. Should the area be too small for cold milling to be practical, the area may be saw cut and removed by methods other than cold milling.

(a) 50ave and 51St – Large pothole in northwest corner of intersection – 9m^2

(b) approx. 100 m^2 additional locations can be added.

2.2 LOCALIZED PAVEMENT FAILURE – FULL DEPTH

From time to time, Town of Whitecourt Utilities crews may need to open a roadway to repair water/sewer line breaks or maintain underground infrastructure. After the repair has been completed by town staff, the excavation area is temporarily filled with gravel to ensure public access to the roadway. The paving of these patches is included in the 2025 Street Improvement Program.

The work includes removal of excess gravel, compaction of the base, and paving the excavation area with two 50 mm lifts of asphalt to match the existing asphalt surface.

2.3 MANHOLE FRAME & COVER ADJUSTMENT, TYPICAL 3M X 3M

Age, settling roadways, and winter conditions can lead manholes to protrude from the roadway. This can be fixed by adjusting the manhole risers and patching the surrounding pavement. All work, including riser adjustments and paving, is incidental.

(a) Park Drive and Park Court – 1 ea.

(b) 50 Ave and 50 St – 1 ea.

(c) 19 Merrifield Pl – 1 ea.

(d) Other locations to be determined – 2 ea.

2.4 WATER MAIN VALVE ADJUSTMENT, TYPICAL 3M X 3M

Age, settling roadways, and winter conditions can lead water main valves to protrude from the roadway. This can be rectified by adjusting the risers and patching the surrounding pavement. All work, including paving, is incidental.

(a) 52 Ave and 46 St – 1 ea.

(b) 50 Ave and 51 St – 1 ea.

(c) 50 Ave and 50 St – 1 ea.

2.5 PATCHING AROUND CC OR VALVE, TYPICAL 1 M X 1 M

Occasionally, valves or CCs require minor repairs or alterations. This results in a small pavement patch which is easily filled. The patch is typically in a driveway, pathway, sidewalk, parking lot, or alternate location outside of the roadway.

(a) No locations determined for this project

2.6 BACKALLEY APRON

The Town of Whitecourt is launching a program to preserve pavement quality by reducing wear on recently-paved roadways. The program involves paving the entrances and exits of back alleys to prevent gravel from migrating onto the adjacent roadway. Each back alley included in the program shall be paved the full lane width, for 6 m length. The typical back alley width is approximately 6 m.

(a) Areas listed within “Major Paving Areas” above – 4 ea.

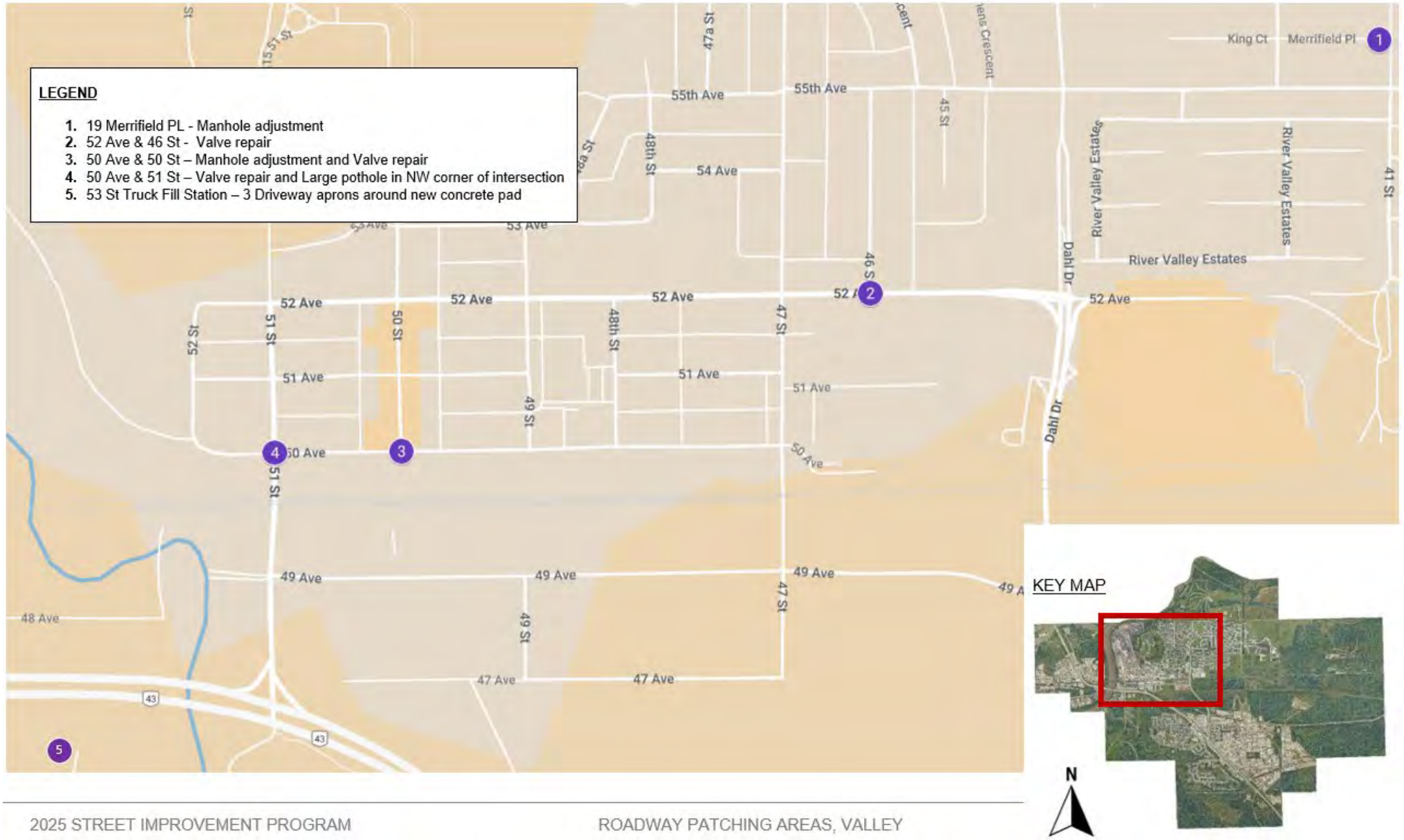
(b) Truck fill concrete pad – 3 ea.

2.7 Thermoplastic Line Painting

Line Painting will be required as a result of the overlay programs resurfacing of several intersections. This will involve painting White Stop Bars, Zebra Crosswalks, Yellow Centerlines, Directional Arrows, Double Directional Arrows, and White Dashed Lane dividers.

(a) Areas Listed in “Major Paving Areas” above – 4 ea.

Please see following pages 13 to 14 for maps of localized pavement failure and roadway patching locations.



2025 STREET IMPROVEMENT PROGRAM

ROADWAY PATCHING AREAS, VALLEY


LEGEND
6. Sunset Boulevard & Whitecourt Ave – Water valve
7. Park Drive & Park Court – Manhole Repair
8. 37 Ave – Patch around Hydrant near Strad
6
7
8
Inset Blvd
Whitecourt Ave
Windfall Dr
Beaver Dr
Sandy Dr
Pine Rd
Caxton St
Dahl Dr
41 St
Kepler St
43
38 Ave
38 St
39 St
37 St
37 Ave
36 Ave
35 St
36 St
33 St
30 St
Blueberry Dr
Pineview Rd
34 Ave
33 Ave
Park Cir N
Park Dr
Ravine Dr
Township Rd 594A
KEY MAP
N

PART 3 - CONCRETE REMOVAL AND REPLACEMENT

Each year, the Town of Whitecourt completes a review of existing assets to ensure the lasting performance of municipal infrastructure. In particular, the Town inspects sidewalks, curbs, gutters, catch basins, and swales to ensure their continued performance. In 2025, the Town of Whitecourt has focused repair efforts to the concrete adjacent to major overlay areas. In addition to these areas, the Town of Whitecourt has included the concrete work described below in Table B3.1.

Please note: the contractor is responsible to fill cuts in the roadway left by the concrete formwork with asphalt. This is considered incidental to the concrete work and no separate payment shall be considered.

Table B3.1 Concrete Removal and Replacement

	No.	Location	Description	Concrete Quantities
VALLEY	1	55 Avenue	Monolithic RF sidewalk, 2 Swales	240m l.m. 45m^2
	2	10 Wellwood Dr	Driveway Patch	10m^2
	3	90 Poplar Dr	Driveway Patch	10m^2
	4	5503 Wagoner Cr	Sidewalk, Monolithic FF Sidewalk, Para ramp	2m^2, 3.6 l.m. Mono FF, 10m^2
	5	5414 48a St	Monolithic RF Sidewalk	4.5 l.m.
	6	52 Ave - in front of Provincial Courts	Monolithic FF Sidewalk	12 l.m.
	7	5528 47a St	Separate Sidewalk, Driveway	7.5m^2, 18m^2
	8	5532 47a St	Driveway	7.5m^2, 18m^2
	9	52 Ave - in front of Central School	Monolithic Sidewalk, Separate Sidewalk, Curb, driveway crossing	21 l.m, 9m^2, 4m, 22m^2
	10	4743 52 Ave - (South side across from Central)	Separate Sidewalk and FF curb	6 l.m.
	11	5101 – 47 St (Main Lift Station)	Remove existing curb and install driveway ramp	18m^2

	12	53 St (Truck fill pad at WTP)	Install new pad on top of existing w/ new heat trace	65m^2
HILLTOP	13	Sunset and Whitecourt Ave	Curb and Gutter	7 l.m.
	14	Beaver Drive	Monolithic RF Sidewalk	15.5 l.m.

3.1 SIDEWALK REHABILITATION LOCATIONS

While a majority of the Sidewalk Rehabilitation program is included in the Major Paving Areas, other locations around Whitecourt may require the removal and replacement of monolithic and separated sidewalks. Areas identified to date are specified below.

In addition to the areas specified below, the Town performs asset inspections in the spring. It is estimated that the inspection will identify and additional 25 l.m. monolithic sidewalk, 10 m^2 of separated sidewalk, 10 l.m. curb and gutter, and 10 m^2 of para ramps.

(a) Areas listed within “Major Paving Areas” above – 4 ea.

(b) 55 Avenue - 240 l.m. of monolithic roll face sidewalk

(c) 62 Beaver Drive (South side of St) – 15.5 l.m. of monolithic roll face sidewalk

(d) 4743 52 Ave (Central School) – 6 l.m. separate sidewalk and FF curb

(e) 52 Ave (Provincial Building) – 12 l.m. FF monolithic sidewalk

(f) 52 Ave (Central School) – 21 l.m. FF monolithic sidewalk, 9m FF separate sidewalk and curb, 22m^2 driveway

(g) Other Locations to be determined – 25 l.m. of monolithic sidewalk, 10 m^2 of separate sidewalk, 10 l.m. of curb and gutter, and 10 m^2 of para ramp.

3.2 ADDITIONAL CATCH BASIN REPLACEMENT

As part of the Town of Whitecourt's phased catch basin rehabilitation program, numerous catch basins in town will be replaced. The work includes removal of the concrete surrounding the catch basin (typically around 8 l.m. of monolithic roll face sidewalk), replacement of the frame and cover, adjustment of the new frame and cover to match the adjacent road elevation (risers may be required), and finally replacement of the concrete surrounding the catch basin.

The contractor is responsible to supply the appropriate frame, cover, and risers. The contractor shall also be responsible for any surface concrete work, such as removal and replacement of sidewalk or curb and gutter surrounding the catch basin. This concrete work is considered incidental to the "catch basin replacement" line item. Once the concrete surface work is complete, the catch basin frame and cover must be grouted to avoid infiltration.

Please note that underground works, such as barrel replacement, is NOT included in this contract. A separate contract shall be issued for any catch basins requiring significant underground works. The Contractor for the 2025 SIP must coordinate schedules with the underground contractor, if applicable.

Catch basin replacements are required for the following locations:

(a) 5 Merrifield Pl cul-de-sac – 1 ea.

(b) 3518 35 St– 1 ea.

(c) 52 Ave & 49 St – 1 ea.

3.3 CONCRETE PATCHING AROUND CC OR VALVE, TYPICAL 1 M X 1 M

Occasionally, valves or CCs require minor repairs or alterations. This results in a small CONCRETE patch which is easily filled. The patch is typically in a driveway, pathway, sidewalk, parking lot, or alternate location outside of the roadway. Please note the material is typically removed by Town of Whitecourt Utility Crews in the winter or early spring, prior to kickoff of the Street Improvement Program.

(a) 5015 52 Ave – 1 ea.

3.4 DRIVEWAY ENHANCEMENT PROGRAM

Advertisements for the driveway enhancement program are posted late in the spring. This is a cost sharing program between homeowners and the Town of Whitecourt to remove and replace existing high profile sidewalks and replace with a driveway entrance. The typical width of driveways in Whitecourt is 7 l.m. x 1.9 l.m., and typically 3-4 households take advantage of the driveway enhancement program each year. Locations will be determined in May.

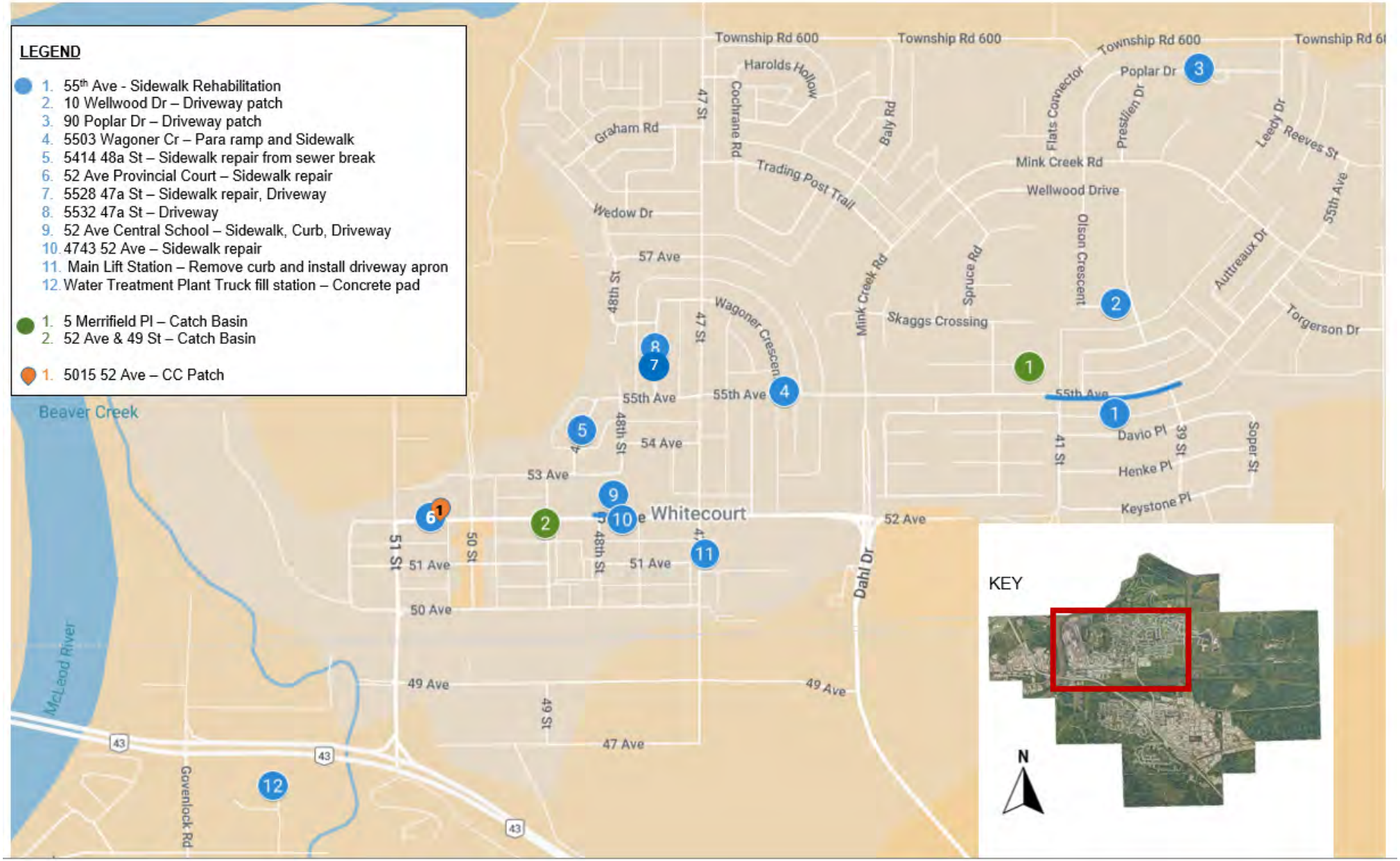
(a) 10 Wellwood Dr – 1 ea.

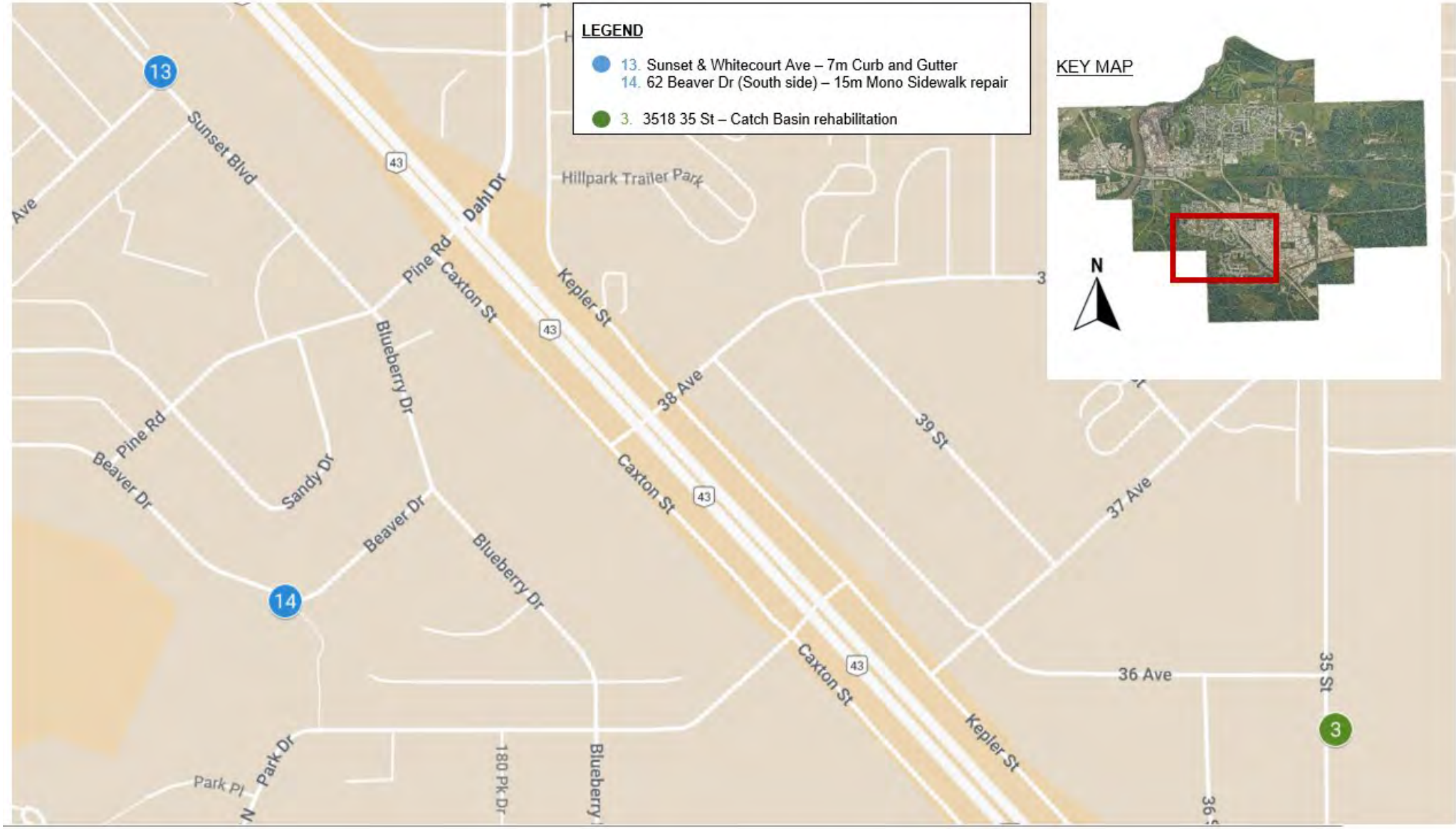
(b) 90 Poplar Dr – 1ea.

(c) 5528 47a St. – 1 ea.

(d) 5532 47a St – 1 ea.

Please see following pages 18 to 19 for maps of the Sidewalk and Catch Basin Rehabilitation Areas


LEGEND
1. 55th Ave - Sidewalk Rehabilitation
2. 10 Wellwood Dr – Driveway patch
3. 90 Poplar Dr – Driveway patch
4. 5503 Wagoner Cr – Para ramp and Sidewalk
5. 5414 48a St – Sidewalk repair from sewer break
6. 52 Ave Provincial Court – Sidewalk repair
7. 5528 47a St – Sidewalk repair, Driveway
8. 5532 47a St – Driveway
9. 52 Ave Central School – Sidewalk, Curb, Driveway
10. 4743 52 Ave – Sidewalk repair
11. Main Lift Station – Remove curb and install driveway apron
12. Water Treatment Plant Truck fill station – Concrete pad
1. 5 Merrifield Pl – Catch Basin
2. 52 Ave & 49 St – Catch Basin
1. 5015 52 Ave – CC Patch
Township Rd 600
Harolds Hollow
Graham Rd
Cochrane Rd
Baly Rd
Flats Connector
Poplar Dr
Prestlien Dr
Leedy Dr
Reeves St
Mink Creek Rd
Trading Post Trail
Wellwood Drive
Wedow Dr
Olson Crescent
55th Ave
Auttreaux Dr
57 Ave
48th St
47 St
Wagoner Crescent
Mink Creek Rd
Spruce Rd
Skaggs Crossing
Torgerson Dr
55th Ave
54 Ave
53 Ave
Davio Pl
39 St
41 St
Soper St
Henke Pl
Keystone Pl
Beaver Creek
Whitecourt
52 Ave
51 St
50 St
51 Ave
50 Ave
49 Ave
49 St
47 Ave
Dahl Dr
McLeod River
Govenlock Rd
43
KEY
N



2024 STREET IMPROVEMENT PROGRAM

CONCRETE AREAS, HILLTOP