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**1.0 GENERAL**

1.1 Scope

- 1.1.1 Perform the Work of the Contract in accordance with the requirements of the Contract Documents. Where the Work is to be performed under a City of Regina Servicing Agreement, the requirements and conditions of the Servicing Agreement take precedence over any other with the exception of Section 00600-General Conditions which govern in all cases.
- 1.1.2 Be responsible for: the progress of the Work; all aspects of safety; co-ordination of the Work of all Sub-Contractors; adherence to construction schedules; submittals; use of site and premises; temporary utilities; deliveries; secure storage of materials; provision of construction facilities and controls and protection of existing structures and utilities.
- 1.1.3 Become thoroughly familiar with the nature of the Work, the Place(s) of the Work and the requirements of the Contract Documents.

1.2 Maintenance Period

- 1.2.1 Rectify at no cost to the Owner all deficiencies of the Work which occur within two (2) years from the date of the Certificate(s) of Substantial Performance of the Contract.

1.3 Safety and Security

- 1.3.1 Ensure compliance with the latest edition(s) of the National Building Code, Occupational Health and Safety Regulations, the Worker's Compensation Act, and related Provincial and Municipal Acts and any regulations thereunder. Compliance must include all provisions of said legislation with respect to prevention of accidents, prevention of diseases and provision of safe working conditions including proper sanitation and ventilation.
- 1.3.2 Immediately comply with any instructions received from safety inspectors and rectify all unsafe conditions before proceeding with the Work.
- 1.3.3 Immediately order the shutdown of Work if a potentially dangerous condition occurs or is noticed or is reported. If the situation warrants, immediately evacuate the area and notify appropriate emergency response agencies.
- 1.3.4 The Owner or the Engineer may, in addition to any right or remedy afforded in the Contract Documents or by law, order the immediate suspension of all Work on the site in the event that violations of worker

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- safety legislation or regulations are reported by Federal, Provincial or local safety officers or inspectors, as the case may be and where the Contractor fails, neglects or refuses to promptly remedy the condition when it is reported to him. Such shutdown order will be withdrawn only when the Contractor has demonstrated that the condition has been rectified or that proper and sufficient provision has been made for compliance with safety measures.
- 1.3.5 Extensions to the Contract completion date, time or increase of the Total Tender Price will not be considered to compensate for any delays to the Work caused by safety violations by any Contractor or Sub-Contractor or, which are as a result of failure by the Contractor to locate or protect existing facilities or structures.
- 1.3.6 Where the Work requires the temporary removal of any permanent security installations such as fences, barricades, locks, gates or bollards, provide and maintain temporary security measures in their place as directed by the Engineer and satisfactory to the Owner of the property affected.
- 1.4 Access and Inspection
- 1.4.1 Provide the Engineer and the Owner and any of their authorized representatives with full, unrestricted access to all portions of the Work at all times in order to carry out inspections. Provide all facilities, equipment and supervision necessary to accomplish this access and inspection. The Engineer will provide the Contractor with reasonable advance notice of his requirement for any special provisions necessary to accomplish an inspection.
- 1.4.2 The Engineer will endeavor to carry out inspections on a timely basis. Extra payment will not be made to the Contractor for delay occasioned by an inspection and no extension of Contract time will be allowed for any such delay.
- 1.4.3 Provide timely notice to the Engineer of inspections requested on portions of Work designated for special tests or inspections or which are required by Law. Provide all safety, access, lighting or other special equipment required by individuals conducting such inspections or tests. Provide manpower assistance as requested or required by Law. If the inspection is by an authority other than the Engineer, provide the Engineer advance notice of the date, time and place fixed for such inspection.
- 1.4.4 Do not cover, bury or otherwise render inaccessible any portion of the Work designated for inspection or test prior to the satisfactory completion of the inspection or test. Bear all costs for uncovering or otherwise providing satisfactory access to Work which has been covered

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- before being inspected or tested. Bear all costs for restoration after the inspection or test.
- 1.4.5 Bear all costs for rectification of deficiencies identified by testing or inspection done by authorized independent testing agencies or public agencies having jurisdiction.
- 1.4.6 The Engineer may direct that any Work be specially examined or re-examined. If such examination reveals that any portion of the Work does not conform to the requirements of the Contract Documents, all costs for the examination and correction will be borne by the Contractor. If no such determination is made, the Owner will bear all related costs.
- 1.4.7 Bear all costs for rectification of Work found to be at variance with the requirements of the Contract Documents regardless of whether or not the Work had previously been inspected, tested or approved by the Engineer or occupied by the Owner.
- 1.5 Relics and Antiquities
- 1.5.1 Relics and antiquities and items of historical or scientific interest such as cornerstones and contents, commemorative plaques, inscribed tablets, skeletal remains and similar objects found on site or in buildings to be demolished are the property of the Owner. Protect such articles and request direction from the Engineer.
- 1.5.2 Immediately notify the Engineer if evidence of archaeological material is encountered and await the Engineer's written instructions before proceeding with any further Work in the area.
- 1.6 Vehicle Safety Certification
- 1.6.1 Ensure that all licensed vehicles used on the Work are in full compliance with the Saskatchewan Government Insurance (S.G.I) Safety Certification Program. Upon request, provide the Engineer with written documentation that any or all of these vehicles are in current full compliance.
- 1.6.2 Immediately remove from the project any vehicle that fails to comply with the S.G.I. Safety Certification Program. Do not re-use any vehicle removed for this reason until all required repairs and upgrades have been fully completed by a licensed tradesman and verified to the satisfaction of the Engineer.

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1.7 Dust Control

- 1.7.1 Control dust to the extent that it poses no restriction to visibility or safety of the public or defacement of public property or structures. Keep any traffic lanes adjacent to the Work area swept clean at all times.
- .1 In addition to the any dust control measures specified in this Contract, the Engineer may direct that water, bituminous prime coat or emulsified asphalt mixed with water be sprayed on the roadway to further control dust.
  - .2 If the hauling creates a dust problem for private dwellings or businesses, the Contractor may be required to spray water or a bituminous prime coat on the haul road or highway.
  - .3 All costs in connection with any aspects of the above mentioned dust control are deemed to be included in the Total Tender Price.
- 1.7.2 Control dust within buildings and structures in a manner satisfactory to the Engineer to the extent that it poses neither risk nor nuisance to occupants or to the operation or maintenance of utility systems serving the building or structure.

1.8 Protection of Trees, Shrubs and Vegetation

- 1.8.1 Permanent tree removal or relocation within City Limits requires pre-approval by the Parks and Community Services Committee prior to Notice of Award and will not be granted during the course of the Work except in special circumstances. Refer to Section 00700-Special Provisions and the Contract Drawings for information regarding removal or relocation approvals granted.
- 1.8.2 Protect trees, including root systems and canopy, from damage in accordance with the *Regina Urban Forest Management Strategy (Appendix G)* and *Bylaw No 2002-48, The Forestry Bylaw, 2002*. Alteration of trench alignment is only acceptable if approved by the Engineer.
- 1.8.3 Obtain prior approval from Community Services for temporary relocation of small trees and shrubs and for the method and location for doing so.
- 1.8.4 Protect trees, shrubs and other vegetation roots and foliage within the full extent of the dripline at all locations where they may be affected by the Work. Obtain Community Services approval for proposed protection methods before proceeding with them.
- 1.8.5 Do not alter grade within the dripline of trees and shrubs that will be retained.

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- 1.8.6 Traffic, dumping and storage of materials within driplines and over root zones are prohibited.
  - 1.8.7 Bear all penalty costs, applied at City of Regina Assessed Value, for damaging trees, shrubs and turf areas outside of indicated or approved boundaries of the Place(s) of Work, including replacement, resulting from the Work.
  - 1.8.8 Limit stripping of topsoil and vegetation to areas approved by the Engineer.
- 1.9 Protection of Waterways
- 1.9.1 Protect waterways from damage or pollution caused by the Work. Bear all costs to correct damage or mitigate pollution caused by the Work.
  - 1.9.2 Construction equipment is prohibited from entering or working in waterways unless specifically allowed or directed by the Engineer.
  - 1.9.3 Removal of waterway bed material for borrow or other purpose is prohibited unless specifically approved by the Engineer.
  - 1.9.4 Placement of excess borrow material, debris or rubbish in any waterway is prohibited.
  - 1.9.5 Design and construct temporary crossings or working platforms within waterways to minimize damage to the watercourse and bank erosion damage and to the satisfaction of the Engineer.
  - 1.9.6 Skidding of logs or other materials across waterways is prohibited.
- 1.10 Existing Utilities
- 1.10.1 Locate all utilities existing within the boundaries of excavation, demolition or alteration required by the Work. Employ location techniques which cause the least amount of damage and disruption. Specifically, use the water jet/vac truck method where appropriate and where non-invasive methods are not possible or satisfactory to the Engineer. Ensure that all employees and Sub-Contractors are made aware of the locations of all buried and overhead utilities (locations as shown on the drawings are approximate only) and of the importance of avoiding damage to them. Bear all costs for location of all utilities and for repair of any damage caused to these utilities.
  - 1.10.2 The Engineer has endeavoured to show all utilities on the drawings. No guarantee express or implied is given with regard to the completeness or accuracy of the information presented. The Contractor is wholly responsible for the location of all utilities which may be damaged as a result of his operations or which may conflict with or hamper free access

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- to the Work or which pose a potential safety hazard.
- 1.10.3 Protect from damage all underground and surface structures and utilities encountered during construction unless the Engineer has issued written authorization for their removal.
  - 1.10.4 Restore all structures and utilities damaged as a result of the Work of the Contract to at least the physical and operating condition that existed prior to the Work. Bear all costs for such restoration.
  - 1.10.5 Plan and execute the Work such that there is no curtailment or interruption of normal utility service without express prior approval of the authority responsible for each utility affected.
  - 1.10.6 Determine the period of advance notification required by each utility for field location of their service and for planned interruption of service. Ensure each utility is contacted within the required notification periods.
  - 1.10.7 Provide a minimum of 24 hours notice of interruption of utility service to each individual customer that will be affected.
  - 1.10.8 Where permission is not granted to interrupt permanent utility service, establish temporary facilities, approved by the authorities of the utility concerned, to provide uninterrupted temporary service.
  - 1.10.9 Plan and carry out the Work so as not to obstruct or make inaccessible existing hydrants, valves, curb stops, fire or police call boxes, transformers, control cabinets, warning systems, manholes or appurtenances thereof.
  - 1.10.10 Keep existing culverts, drains, flumes and ditches clear of obstruction at all times. Where obstruction is unavoidable provide and maintain temporary means of disposal or transport of drainage water.
- 1.11 Cutting and Patching
- 1.11.1 Submit a written request in advance of performing cutting or alteration which may affect:
    - .1 Structural integrity of any element.
    - .2 Integrity of weather exposed or moisture resistant elements.
    - .3 Efficiency, maintenance or safety of any operational element.
    - .4 Visual qualities of sight exposed elements.
    - .5 Work of Owner or separate Contractor.

- 1.11.2 Inspect existing conditions including elements which may be subject to damage or movement during cutting and patching. Provide all necessary measures to prevent or minimize damage or movement to levels deemed acceptable by the Engineer.
  - 1.11.3 Perform cutting and patching of rigid materials using saws or drills. Use of impact tools is prohibited unless specifically authorized by the Engineer.
  - 1.11.4 Refinish or replace surfaces adjacent to cutting or patching operations which are damaged as a result of those operations. For continuous surfaces refinish to the nearest joint(s). For assemblies refinish the entire unit. Restore Work with new Product.
  - 1.11.5 Where a penetration is made through a fire rated wall, fill all voids and annular spaces using non-shrink mastic rope or other approved product such that the full fire rating of the wall is restored in compliance with the applicable Fire and Building Codes.
- 1.12 Field Records
- 1.12.1 Continuously maintain and update a set of field records which clearly and accurately document all deviations of the Work from that shown on the drawings. Particularly, this record must indicate changes in line or grade or materials installed and, locations, sizes, materials and elevations of all utilities encountered. Turn over all records to the Engineer at the completion of the Work.
  - 1.12.2 Make the field record set available to the Engineer at all times.
  - 1.12.3 When continuous site inspection is not provided, notify the Engineer prior to covering up or otherwise rendering inaccessible major or critical parts of the Work. The Engineer will, if time and schedule permit, make arrangements to have photographs taken. If this is not expedient the Contractor will, after consultation with the Engineer, take photographs as directed and proceed with the Work. Provide this film to the Engineer.
- 1.13 Surveys and Survey Markers
- 1.13.1 Unless specified elsewhere to the contrary, the Engineer will establish benchmarks, monuments and stake lines, designated as such to the Contractor, and will be responsible for their accuracy.
  - 1.13.2 The Contractor may establish additional base lines and other principal controlling points, lines and grades as he requires. The Contractor is wholly responsible for the accuracy of this work in relation to the control established by the Engineer. The Engineer may check lines and grades

established by the Contractor.

1.13.3 Bear all costs for the replacement of legal survey markers disturbed, removed or damaged by construction where such markers were 4.0 m or more from the centreline of pipe being installed or outside face of structure being built. Notify the Engineer if it is desired to move an existing marker which is within the 4.0 m distance. The relocation of the marker will be at the expense of the Owner only if the Engineer agrees that the movement of the marker is warranted by the requirements of the construction operation.

1.13.4 Legal survey markers may be replaced only by a qualified Saskatchewan Land Surveyor.

1.13.5 All elevations established by the Engineer will be metric Geodetic Datum.

**1.14 Salvage Materials**

1.14.1 All material removed during construction remains the property of the Owner. Dispose of all materials as directed by the Engineer. Disposal will be as follows:

MATERIAL	DISPOSAL LOCATION
Excess excavated trench material	Sanitary Landfill or as directed by the Engineer
Asphalt: Excavated or Cold Planed	Sanitary Landfill Stockpile or as directed by the Engineer
Concrete: Reinforced or non-reinforced	Sanitary Landfill Stockpile
Guardrail materials	Sanitary Landfill
Chain Link fence posts	Sanitary Landfill
Asbestos Cement Pipe and asbestos bearing materials	Sanitary Landfill (permit required; see details elsewhere in this section)
Pipe – any metallic material Hydrants Manhole/catchbasin frames or covers Valve boxes, extensions or caps Chain Link Fence mesh	Central stores Salvage yard 6 <sup>th</sup> Ave. and St. John St.

1.14.2 Bear all costs for the loading, transportation, unloading and disposal for all listed materials and any others which may be encountered during the course of the Work and designated by the Engineer.

**1.15 Disposal of Rubbish**

1.15.1 Do not allow rubbish to accumulate. Provide means to contain rubbish and prevent it from blowing or otherwise creating nuisance.



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- 1.15.2 Provide loading and transportation of rubbish to authorized disposal site(s) or, as may be directed by the Engineer. Cover loads being hauled.
  - 1.15.3 Burial of rubbish at the Place(s) of Work may be permitted but only with the express permission of the Engineer.
  - 1.15.4 Burning of rubbish is not permitted.
  - 1.15.5 Dispose of waste volatile liquids and liquids designated as hazardous or pollutants to the location(s) prescribed by the authority having jurisdiction and, conform with requirements for storing, handling and transport of these materials.
  - 1.15.6 Bear all costs related to collection, containment and disposal of rubbish.
- 1.16 Hauling and Disposal of Asbestos Materials
- 1.16.1 Asbestos bearing material must be disposed of at the City of Regina Landfill. An asbestos disposal permit is required and can be obtained from Public Works Division, Environmental Engineering Department at City Hall.
  - 1.16.2 A burial fee is applicable to every full load or partial load delivered to the Landfill. Therefore, as much possible, deliver only full loads of this material. Where the progression of the work makes this logistically difficult, if possible, suitably bag or wrap and store the material in compliance with applicable codes or direction of a competent authority in a secure location until there is sufficient volume to make a full load.
  - 1.16.3 After loading, completely cover the asbestos bearing material with dirt then tarp or otherwise cover the load before hauling.
  - 1.16.4 Conform with the requirements of all other applicable codes and ordinances for storage, handling and transport of this material.
  - 1.16.5 Bear all Landfill charges applicable to disposal of asbestos bearing material.

**2.0 PRODUCT**

None in this Section

**3.0 EXECUTION**

None in this Section

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**1.0 GENERAL****1.1 Scope of Work**

1.1.1 The Work of this Contract includes but is not limited to:

I – Bridge Replacements

- .1 Remove the timber bridge on Victoria Avenue eastbound over Pilot Butte Creek;
- .2 Remove the concrete bridge on Victoria Avenue westbound over Pilot Butte Creek;
- .3 Meet all regulatory requirements for working in the creek;
- .4 Install concrete box culverts in place of the two (2) bridges;
- .5 Maintain traffic on Victoria Avenue with staged construction (two lanes);
- .6 Asphalt driving surface; and
- .7 Approach guardrails and bridge rails.

II – Victoria Avenue Widening and Overlay

- .8 Widen Victoria Avenue eastbound and westbound to three (3) lanes;
- .9 Maintain traffic on Victoria Avenue during construction; and
- .10 Mill and pave existing eastbound and westbound lanes.

III – Eastgate Drive Right In/Right Out (separate price)

- .11 Remove the timber bridge on Eastgate Drive over Pilot Butte Creek;
- .12 Remove asphalt roadway from Coleman Crescent to the east side of Pilot Butte Creek;
- .13 Construct sidewalk on the east side of Coleman Crescent across removed Eastgate Drive;
- .14 Create right in/right out off of Victoria Avenue westbound to connect with Eastgate Drive on the east side of Pilot Butte Creek; and,
- .15 Regrade and seed using hydraulic seed mulch.

**1.2 Work by Owner**

1.2.1 None in this Contract.

**1.3 Product supplied by Owner**

- 1.3.1 The Owner shall supply the Project Signs as indicated on the Drawings for installation by the Contractor.
- 1.3.2 The Owner can supply a maximum of fifty precast traffic barriers for use by the Contractor. The Contractor shall be responsible for pickup and return of the barriers to the City Yard.

**1.4 Work By Others**

1.4.1 None in this Contract.

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## 1.5 Work Sequence

### 1.5.1 The Work Sequence includes but is not limited to:

- .1 The Contractor shall not carry out any Work which affects the traffic flows on Victoria Avenue, without the prior written approval of the City of Regina.
- .2 The Contractor shall submit, in writing, to the Engineer at least two (2) weeks in advance, requests for approval to carry out any Work which will affect the traffic flow on Victoria Avenue. The Contractor shall submit separate requests for each item of Work.
- .3 Prior to submitting such requests, the Contractor shall produce a schedule which shows the anticipated shut-down dates, the periods of the shutdown and the start-up dates which will interrupt the traffic flows. The schedule is to be prepared in consultation with the Engineer and the City of Regina. The City of Regina shall have final approval on all shutdowns and closures.
- .4 Once the Work is started, the Contractor shall work continuously in order to keep each shut-down or closure to a minimum.
- .5 During the course of such Work, the Engineer may, at the request of the City, instruct the Contractor to take whatever measures are necessary to restore traffic as quickly as possible. The Contractor shall immediately comply with such an instruction and provide all necessary resources to restore the operations in an expeditious manner. The Contractor shall work additional hours, outside normal working hours if necessary, without additional payment.
- .6 The Contractor shall maintain liaison with the Engineer and the City at all times during shut-down periods.
- .7 The Contractor shall also schedule and coordinate the Work to avoid interruptions, conflicts and delays to his work and the Work of the other Contractors. The Contractor shall hold regular progress meetings with the other Contractors for purposes of scheduling the Work and hold the Owner harmless for any claims for delays from the other Contractors. The Owner will not be responsible nor pay for extra costs arising from delays or conflicts with other work.

## 1.6 Contractors Use of Premises

- 1.6.1 Unless written conditions or instructions are issued to the contrary, the Contractor has unrestricted use of the Place of Work until such access is no longer required to perform Work, or unless such access is revoked in writing by the Engineer due to breach of Contract or other emergency

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- situation.
- 1.6.2 Ascertain and adhere to boundaries of Places of Work within which Work must be confined.
  - 1.6.3 Obtain written authorization from the Engineer to enter private lands which are the subject of easements or rights-of-way obtained by the Owner. Ascertain and abide by all conditions pertaining to the use of such easements or rights-of-way.
  - 1.6.4 Prior to final inspection, obtain and submit to the Engineer signed releases from all owners of lands affected by easements or rights-of-way. Releases must stipulate that all properties have been restored to an acceptable condition and that the owners have no further claims in these respects. The Engineer will provide a standard Release Form.
- 1.7 Work By Utilities
- 1.7.1 Be responsible for arrangement, scheduling and coordination of all Work by Utility companies necessitated by the Work of this Contract.
  - 1.7.2 Provide personnel assistance, traffic accommodation, protection and continuation of utility services required by the Utility concerned for the performance of their Work and as detailed in Section 01001-General Requirements.
- 1.8 Drawings and Specifications Provided
- 1.8.1 Six (6) complete sets of Contract Documents will be provided to the Contractor at no charge. Subsequent sets required by the Contractor will be provided for a non-refundable charge of one hundred dollars (\$100.00) per set.
- 1.9 Landfill Charges
- 1.9.1 All landfill charges for the disposal of reinforced concrete, concrete, asphalt rubble or any materials designated as unsuitable for salvage by the Engineer shall be the responsibility of the Contractor.
  - 1.9.2 The Contractor may obtain the fee structure from the City of Regina Public Works Department.
- 1.10 Damage to Existing Structures and Property
- 1.10.1 Special care shall be taken to avoid damage to existing adjacent structures and/or property during the course of these works.
  - 1.10.2 Any damage caused by the Contractor to the existing structures and properties shall be rectified by the Contractor, at his sole expense, to the
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satisfaction of the Engineer.

1.10.3 Damage to existing roadway structures resulting from the Contractor's operations, including the hauling of excavated earth offsite, shall be repaired at his sole expense.

1.11 Earth Excavation

1.11.1 Disposal of all earth excavation removed from the site will be the responsibility of the Contractor.

## **2.0 PRODUCTS**

None in this Section

## **3.0 EXECUTION**

None in this Section

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**1.0 GENERAL****1.1 Measurement and Payment**

- 1.1.1 No payment(s) will be made prior to the completion of Contract execution by both parties and all requisite bonds and insurance have been submitted and approved.
- 1.1.2 For each unit price item, the Engineer will calculate payment based upon the bid unit price(s) in the Form of Tender- Schedule of Quantities and Prices and the Engineer's determination of units of Work item(s) completed.
- 1.1.3 For each lump sum price item, the Engineer will calculate payment based upon the bid lump sum price for each item in the Form of Tender – Schedule of Quantities and Prices and the Engineer's estimate of the percentage of Work completed for each item.
- 1.1.4 Measurement of pay items will be by the units specified in the Form of Tender – Schedule of Quantities and Prices and will be to the lines and limits shown on the drawings or by field survey, as deemed appropriate by the Engineer.
- 1.1.5 Some items of Work required to complete the Contract may not be specifically mentioned in a payment clause. Where this occurs, include payment for all costs associated with each item within the most appropriate payment item in the Form of Tender.

**1.2 Progress Claims****1.2.1 Contractor's Responsibilities**

- .1 Submit a progress claim to the Engineer for the Work of the previous month within five (5) working days after the end of that month.
- .2 Submit the claim only in the format issued by the Engineer.
- .3 Whenever a project Inspector is assigned to the project, review each payment item and intended degree of progress to be claimed with the Inspector prior to submitting the claim to the Engineer.
- .4 Provide documentation to substantiate claims for materials held to be on site.
- .5 Provide any other documentation required by the Engineer to support the progress claim.

## 1.2.2 Engineer's Responsibilities

- .1 Review each progress claim promptly and either immediately advise the Contractor of apparent discrepancies or incomplete submittal or sign the claim and forward it to the Owner for payment. Wherever possible, authorize claims within ten working days following receipt from the Contractor.
- .2 The Engineer's estimate of percentage of Work completed will govern the calculation of payment for all payment items.

## 1.3 Change Orders

- 1.3.1 Promptly complete and return Change Price Requests issued by the Engineer. If requested, supply appropriate supporting documentation for the price(s) quoted.
- 1.3.2 Only proceed with Work which is authorized by Change Order which has been signed by the Engineer, the Owner and the Contractor.

## 1.4 Taxes

- 1.4.1 Include in the Total Tender Price, payment for all sales taxes, licenses and all municipal, provincial or federal charges applicable to the Contract and subject to the following provisions.

- .1 Federal Goods and Services Tax

- .1 The total federal Goods and Services Tax (GST) is to be shown as a separate item in the Form of Tender and is not to be included in each payment item. The GST is payable by the Owner and is to be included in the Total Tender Price. Show the GST separately on all monthly progress claims.

- 1.4.2 Provincial Sales Tax (PST)

- .1 If the Contractor is not ordinarily resident in Saskatchewan, the Contractor must, immediately upon the execution of the Contract Documents, provide the City with proof that the Contractor has fully complied with section 29 of the Provincial Sales Tax Act (Saskatchewan) (PSTA), including proof that the following has been received by the Saskatchewan Minister of Finance:
  - .1 A deposit equivalent to the percentage of the Total Tendered Price as set out in the PSTA;

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- .2 A guarantee bond, satisfactory to the Saskatchewan Minister of Finance in the penal sum (percentage of the Total Tendered Price) as set out in the PSTA.

## 1.5 Payment Items

1.5.1 Payment items are in accordance with Section 00400 - Form of Tender. The relevant specification sections are noted adjacent to the Payment Items. With the exception of the City of Regina Standard Construction Specifications, reference shall be made to these specification sections for the measurement and payment of these items. For the City of Regina Standard Construction Specifications refer to the payment items listed below.

### 1.5.2 General Requirements

General Requirements shall consist of the necessary work and operation including, but not limited to, the movement of personnel, equipment, supplies and incidentals to the Work, the establishment of offices, camps and other facilities necessary to undertake the Work and for expenses incurred for other Work and operations which must be performed prior to the commencement of the Work.

#### MEASUREMENT:

The City of Regina will pay for general requirements at the lump sum price bid for General Requirements which payment shall be compensation in full for all costs associated with general requirements. No payment for General Requirements will be made until the value of the work completed on bid items other than general requirements exceeds 10% of the total tender price. If the amount bid for General Requirements exceeds 10% of the total original Contract tender amount, the City of Regina will withhold the portion in excess of 10% until the date of Construction Completion.

#### PAYMENT:

The amount bid for General Requirements will be paid only once, regardless of the number of times the Contractor mobilizes. There will be no separate payment made for demobilization.

### 1.5.3 Traffic Accommodation

The Contractor shall be responsible for the implementation of the supply and installation of all traffic signs, barriers, controls, and any other traffic control measures required to ensure the safe movement of vehicles and pedestrians through the worksite at all times. Construction staging can be found on drawings D-0001, D-0002, and S-0002 for the Contractor's reference.



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The Contractor shall submit to the Engineer detailed signage plans and set-up and tear down procedures for each stage of construction a minimum of five (5) days in advance of implementation.

**MEASUREMENT:**

Measurement will be based on a percentage complete as determined by the Engineer in accordance with Clause 1.1.3.

**PAYMENT:**

Payment for Traffic Accommodation will be made at the lump sum bid for the implementation of Traffic Accommodation required to facilitate the construction sequence shown on the plans. This payment will be full compensation for completing the Work required and as described above including supply and install, excavation and for the use of all equipment, tools, labour and incidentals necessary to complete the Work. This payment also includes all Work for installation and removal of detours including crossovers.

1.5.4 Sawcutting

Sawcutting will be in accordance with the Specifications.

**MEASUREMENT:**

No separate measurement will be made for sawcutting.

**PAYMENT:**

No separate payment for sawcutting will be made. The cost of sawcutting shall be included in the unit price rate for the appropriate item of Work.

1.5.5 Asphalt or Concrete Pavement Removal

Supply all labour, equipment and material required to remove asphalt or concrete at locations shown on the drawing in accordance with the Specifications. Locations for the disposition of the removed asphalt or concrete shall be to the Landfill unless otherwise detailed in the Special Requirements. Hauling costs and landfill charges are the responsibility of the Contractor.

**MEASUREMENT:**

Measurement of Asphalt or Concrete Pavement Removal will be on a per cubic metre (m<sup>3</sup>) basis.

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**PAYMENT:**

Payment for Asphalt or Concrete Pavement Removal will be included in the unit price for the appropriate item of work and shall be full compensation for all labour, equipment and materials necessary for the Work

**1.5.6 Cold Planing**

Supply all labour, equipment and material required to remove asphalt by cold planing (approximately 50mm depth) at locations shown on the drawings in accordance with the Specifications. Locations for the disposition of the removed asphalt or pavement shall be to the Landfill unless otherwise detailed in the Special Requirements. Hauling costs and landfill charges are the responsibility of the Contractor.

**MEASUREMENT:**

Measurements shall be made based on the square metre (m<sup>2</sup>) as measured by the Engineer.

**PAYMENT:**

Unit price bid per metre squared.

**1.5.7 Embankments for Base Bid (Table I)**

Supply all labour, equipment, and materials necessary to complete the embankments as indicated on the plans, as directed by the Engineer in accordance with the Specifications.

**MEASUREMENT:**

No separate measurement for embankments will be made.

**PAYMENT:**

Payment for embankments will be included in the unit price for the appropriate item of work and shall be full compensation for all labour, equipment and materials necessary for the Work.

**1.5.8 Crack Sealing****MEASUREMENT:**

No separate measurement for crack sealing will be made.

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**PAYMENT:**

Payment for crack sealing will be included in the lump sum price for the appropriate item of work and shall be full compensation for all labour, equipment and materials necessary for the Work.

**1.5.9 Trench Excavation and Backfill**

Supply all labour, equipment, and materials necessary to complete the trench excavation and backfill as indicated on the Drawings or as directed by the Engineer in accordance with the Specifications.

**MEASUREMENT:**

No separate measurement for Trench Excavation and Backfill will be made.

**PAYMENT:**

Payment for trench excavation and backfill will be included in the unit price for the appropriate item of work and shall be full compensation for all labour, equipment and materials necessary for the work.

**1.5.10 Culvert Installation**

Supply all labour, equipment, and materials necessary to complete the installation of culverts as indicated on the Drawings or as directed by the Engineer in accordance with the Specifications.

**MEASUREMENT:**

Measurements shall be made on a linear metre (Lm) basis.

**PAYMENTS:**

Payment for Culvert Installation will be included in the unit price for the appropriate item of work and shall be full compensation for all labour, equipment and materials necessary for the Work.

**1.5.11 Sub-grade Preparation – Non Granular**

Supply all labour, equipment and materials necessary to prepare and compact non-granular sub-grade as indicated on the Drawings or directed by the Engineer in accordance with the Specifications.

**MEASUREMENT:**

Measurement for Sub-grade Preparation shall be made per square metre (m<sup>2</sup>). Depth is specified in the tender form.

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**PAYMENT:**

Payment for Sub-grade Preparation will be included in the unit price for the Work and shall be full compensation for all labour, equipment and materials necessary for the Work.

**1.5.12 Supply and Placement of Asphaltic Concrete**

Supply all labour, equipment and materials to place Asphaltic Concrete as indicated on the Drawings or directed by the Engineer in accordance with the Specifications.

**MEASUREMENT:**

Measurements shall be made based on the tonne (t) as determined from official tickets obtained from the asphalt trucks upon placement.

**PAYMENT:**

Payment for placement of asphaltic concrete will be included in the unit price bid for the work and shall be full compensation for all labour, equipment and materials necessary for the Work. Hauling shall be considered incidental to the Work.

**1.5.13 Hydraulic Seed Mulch**

Supply all labour, equipment and materials to spread topsoil and hydraulic seed mulch on ditches, backslopes, sideslopes or other areas as directed by the Engineer within the right of way, including, but not limited to, loading hauling, spreading and final grading, as indicated on the drawings or in accordance with the Specifications.

**MEASUREMENT:**

Measurement for Hydraulic Seed Mulch shall be on a square metre (m<sup>2</sup>) basis.

**PAYMENT:**

Payment for Hydraulic Seed Mulch will be included in the unit price for the appropriate item of work and shall be full compensation for all labour, equipment and materials necessary for the Work.

**1.5.14 Concrete Curb & Gutter**

Supply all labour, equipment and materials remove or construct Curb and Gutter as indicated on the Drawings or directed by the Engineer in accordance with the Specifications.

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**MEASUREMENT:**

Measurement for Concrete Curb & Gutter will be made on a linear metre (Lm) basis.

**PAYMENT:**

Payment for Concrete Curb & Gutter will be included in the unit price for the appropriate item of work and shall be full compensation for all labour, equipment and materials necessary for the Work.

**1.5.15 Concrete Median**

Supply all labour, equipment and materials required to remove or construct Concrete Median and or pave the centre median area between concrete boulevard curbs as indicated on the Drawings or directed by the Engineer in accordance with the Specifications.

**MEASUREMENT:**

Measurement for Concrete Median Concrete will be made on a square metre (m<sup>2</sup>) basis.

**PAYMENT:**

Payment for Concrete Median Concrete will be included in the unit price for the appropriate item of work and shall be full compensation for all labour, equipment and materials necessary for the Work.

**1.5.16 Pedestrian Ramps**

Supply all labour, equipment and materials to construct pedestrian ramps as indicated on the Drawings or directed by the Engineer in accordance with the Specifications.

**MEASUREMENT:**

Measurement for Pedestrian Ramps will be made on a per ramp (No.) basis.

**PAYMENT:**

Payment for Pedestrian Ramps will be included in the unit price for the appropriate item of work and shall be full compensation for all the labour, equipment and materials necessary for the Work.

**1.5.17 2.0 m Monolithic Walk**

Supply all labour, equipment and materials to construct 2.0 m Monolithic

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Walk as indicated on the Drawings or directed by the Engineer in accordance with the Specifications.

**MEASUREMENT:**

Measurement for 2.0 m Monolithic Walk will be made on a square metre (m<sup>2</sup>) basis.

**PAYMENT:**

Payment for 2.0 m Monolithic Walk will be included in the unit price for the appropriate item of work and shall be full compensation for all the labour, equipment and materials necessary for the Work.

**1.5.18 Removal and Disposal of Existing Guardrail**

The Work will consist of the removal and disposal of all designated sections of guardrail including posts and filling and compaction of all holes left from post removal before nightfall.

All materials designated for removal and disposal shall become the property of the Contractor and shall be disposed of in a manner and location satisfactory to the Engineer.

**MEASUREMENT:**

Measurement for removal, of barrier or guardrail sections, including end terminals and bridge connections and posts, will be in meters (m) of the length of each type of guardrail or barrier removed and reinstalled.

**PAYMENT:**

Payment will be made at the unit price bid per metre (m) for Remove and Dispose of Existing Guardrail for the type of guardrail removed. This payment will be full compensation for removing and disposing of the guardrail material as directed by the Engineer.

**1.5.19 Perforated Drainage Pipe**

Supply all labour, equipment, and materials for the installation of perforated pipe as indicated on the plans, as directed by the Engineer in accordance with the Specifications.

**MEASUREMENT:**

No separate measurement will be made for perforated pipe.

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**PAYMENT:**

No separate payment for perforated pipe will be made. The cost of perforated pipe shall be included in the unit price rate for the gravel foundation item of work.

**1.5.20 Earth Excavation**

All excavation shall be in accordance with Sections 2110, Excavation and 2315, Trench Excavation and Backfill.

This specification applies to all excavation required for the project including but not limited to:

- Excavation for the culvert and the culvert bed, including sub-cut if required.
- Excavation required for stripping and removal of topsoil.
- Excavation required for the installation and removal of temporary traffic detours.
- Excavation of existing base.

Supply all labour, equipment, and materials necessary to complete the excavation as indicated on the plans, as directed by the Engineer in accordance with the Specifications.

**MEASUREMENT:**

Measurement for earth excavation will be made on a cubic metre (m<sup>3</sup>) basis in cut.

**PAYMENT:**

Payment for earth excavation will be made on the basis of the unit price bid. This payment will be full compensation for completing the Work as described above including the use of all equipment, tools, labour and incidentals necessary to complete the Work. Hauling costs are considered incidental to the Work and no separate or additional payment shall be made.

Payment by the cubic metre (m<sup>3</sup>) shall not relieve the Contractor from responsibility to ensure the final cross sections are built to the neat lines shown on the plans. No separate or additional payment shall be made due to needless over excavation determined by the Engineer to be at the sole discretion of the Contractor.

**1.5.21 Sub-Drainage Sand**

Supply all labour, equipment and materials to install sub-drainage sand as per the specifications at locations indicated on the drawing or as directed by the Engineer, including but not limited to loading, hauling, placing spreading, watering and compacting.

**MEASUREMENT:**

Measurements shall be made based on the tonne (t) as determined from official tickets obtained from the granular supplier. The Contractor shall be responsible to obtain tickets from the supplier and provide copies to the Engineer.

**PAYMENT:**

Payment for sub-drainage sand will be included in the unit price bid for the Work and shall be full compensation for all labour, equipment and materials necessary for the Work. Hauling shall be considered incidental to the work.

## 1.5.22 Granular Base Course

Supply all labour, equipment and materials to install base course as per the specifications at locations indicated on the drawing or as directed by the Engineer, including but not limited to loading, hauling, placing spreading, watering and compacting.

**MEASUREMENT:**

Measurements shall be made based on the tonne (t) as determined from official tickets obtained from the granular supplier. The Contractor shall be responsible to obtain tickets from the supplier and provide copies to the Engineer.

**PAYMENT:**

Payment for granular base course will be included in the unit price bid for the Work and shall be full compensation for all labour, equipment and materials necessary for the Work. Hauling shall be considered incidental to the Work.

## 1.5.23 Asphaltic Primer or Tack Coat

**MEASUREMENT:**

Measurement of Asphaltic Primer or Tack Coat shall be on a square metre (m<sup>2</sup>) basis.

**PAYMENT:**

Payment for Asphaltic Primer or Tack Coat will be included in the unit price bid for the Work and shall be full compensation for all labour, equipment and materials necessary for the Work.



**2.0 PRODUCTS**

2.1 Progress Payment Certificate Form

- 2.1.1 An electronic template version will be supplied to the Contractor after the Contract is executed. The copy supplied will be completed with the payment items and quantities from the Form of Tender of the executed contract. The electronic version is security protected but will allow the entering of quantities claimed for each Progress period. The electronic version has been produced in <sup>TM</sup>Microsoft Excel format. Progress payment claims must be submitted in hardcopy in the format provided. Claims which are not submitted in this format will not be processed for payment.

**3.0 EXECUTION**

None in this Section

**1. REQUIREMENTS INCLUDED**

- .1 Field engineering survey services to measure and stake the site, including setting grades for all curbs, and roadway.
- .2 Survey services to establish and confirm measurements for the existing roadway and approaches and establish lengths for new work.
- .3 Survey services to establish the as-constructed elevations of all new work including all roadway elevations.
- .4 Survey services to establish and confirm measurements for the following components:
  - .1 Box culvert inverts.
  - .2 Final wearing surface elevations.

**2. RELATED REQUIREMENTS**

- .1 Record Documents: Section 01700.
- .2 Owner's identification of existing survey control points and property limits.

**3. QUALIFICATIONS OF SURVEYOR**

- .1 Minimum five (5) years experience in layout and control work on previous construction projects of similar scope.
- .2 The same surveyor is to be utilized throughout the course of the project.

**4. SURVEY REFERENCE POINTS**

- .1 Existing base horizontal and vertical control points will be designated on drawings Issued for Construction.
- .2 Locate, confirm and protect control points. Preserve permanent reference points during construction.
- .3 Make no changes or relocations without prior written notice to the Engineer.
- .4 Report to Engineer when a reference point is lost or destroyed, or requires relocation.
- .5 Require Surveyor to replace control points in accordance with the original survey control.

**5. SURVEY REQUIREMENTS**

- .1 Establish lines and levels; locate and lay out by instrumentation.
- .2 Establish elevations for construction and record as-constructed elevations.
- .3 Establish roadway elevations.

**6. RECORDS**

- .1 Maintain a complete, accurate log of control and survey work as it progresses.
- .2 Submit as-constructed elevations to Engineer.

**7. SUBMITTALS**

- .1 On request of the Engineer, submit documentation to verify accuracy of field engineering work.

**1. SITE CONDITIONS/LIMITS**

**1.1 Examination of Site**

- .1 Prior to commencing actual construction work, inspect field conditions, obtain and confirm actual site and structure dimensions, examine surface conditions, as required, to ensure correct execution of the work.
- .2 Commencement of construction constitutes acceptance of existing conditions and means dimensions have been considered verified and are acceptable.

**2. DOCUMENTS/INSTRUCTIONS**

**2.1 Discrepancies/Omissions**

- .1 Notify the Engineer immediately upon discovery of discrepancies or omissions in the Contract Documents or of any doubt as to the meaning or intent of any part thereof.

**2.2 Documents on the Site**

- .1 Maintain one copy of all current Contract Documents and all shop drawings on site, in good order and available to the Engineer or his representatives.
- .2 This requirement does not include the executed Contract Documents.

**1.0 GENERAL**

1.1 Symbols on Drawings

1.1.1 Refer to drawings for explanation of symbols.

1.2 Conversions

1.2.1 Conversions used on drawings and in the specifications are typically “soft” conversions which are rounded off and are not exact imperial to metric conversions. Metric figures which are presented as decimals or as odd numbers are typically “hard” conversions that are exact conversions. Confirm with the Engineer any dimension or size that is in doubt or is extremely critical as to its conversion status.

1.2.2 Pipe Size Conversions

(mm)	(ins.)	(mm)	(ins.)
5	¼	400	16
10	3/8	450	18
15	½	500	20
20	¾	525	21
25	1	600	24
30	1 ¼	675	27
40	1 ½	750	30
50	2	860	34
65	2 ½	900	36
75	3	1050	42
100	4	1200	48
150	6	1350	54
200	8	1500	60
250	10	1650	66
300	12	1800	72
350	14	2100	84
375	15	2400	96

1.2.3 “Hard” conversions

1 inch = 25.4mm

12 inches = 304.8mm = 0.3048 metres

1 metre = 39.36 inches = 3.281 ft.

1.0 km (kilometre) = 1000 metres = 3,281 ft.

1.0 Imperial gallons = 4.54 litres

1.0 US gallons = 3.785 litres

1.0 cubic metre (m<sup>3</sup>) = 1000 litres = 220 Imperial gallons

1.0 ML (megalitre) = 1,000,000 litres = 1000 m<sup>3</sup> = 220,000 Imperial Gallons

1.0 dam (cubic decametre) = 1000 cubic metres (m<sup>3</sup>)  
1.0 milligram per litre (mg/l) = 1.0 parts per million (ppm)  
1.0 lb. = 16 ounces = 454 grams  
1.0 kg. = 2.2 lbs.  
1.0 Imperial gallons of water weighs 10.0 lbs. = 4.54 kgs.  
1.0 litre of water weighs 1.0 kg = 2.2 lbs.

1.0 lb/in<sup>2</sup> (psi) = 2.31 ft. of water = 6.894 kPa  
1.0 MPa = 1.0 megapascals = 1,000,000 pascals = 145 psi

1.0 m<sup>2</sup> = 10.76 ft<sup>2</sup>  
1.0 acre = 2.47 ha (hectares)  
1.0 cubic metre = 1.307 cubic yards  
1.0 cubic metre = 35.32 ft<sup>3</sup>

1.0 mil = 0.001 ins. = 25.4 microns (mμ)

1.0 m/s (metres/second) = 3.28 ft/sec.  
1.0 m<sup>3</sup>/s (cubic metres/second) = 35.32 ft<sup>3</sup>/sec.  
1.0 l/s (litre/second) = 13.2 Igpm (Imperial gallons/minute)

1.0 hp (horsepower) = 0.746 kW (kilowatts)  
1.0 Btu/h = 0.293 W (watts)

1.3 Abbreviations

1.3.1 Symbol or Abbreviation:

<b>A</b>	
A	Ampere
AB	anchor bolt
ABS	acrylonitrile butadiene styrene (plastics)
ac	alternating current
AC	Asbestos cement(pipe)
AFC	Automatic frequency control
AF	audio frequency
A·h	Ampere hour
Al	Aluminum
AM	Amplitude modulation
ARV	air release valve
AUX	Auxiliary
AVG	Average
AVV	air vacuum valve
AWG	American wire gauge
<b>B</b>	
BAV	ball valve
BBL	Barrel
BFP	Backflow preventer
BLDG	Building
BM	bench mark (survey)
BoW	back of walk
BPD	barrels per day
BSMT	Basement
Btu	British thermal unit
BV	Butterfly valve
BWV	Backwater valve

<b>C</b>	
°C	Celsius degrees
CAV	combination air valve
CB	catch basin
CBR	Catch basin rim (elev.)
cc	cubic centimetre
CCRED	concentric reducer
Cd	Cadmium
CDN	Canadian
CI	cast iron
CIOD	Cast iron outside diameter
C-I-P	cast-in-place (concrete)
Cl	centreline
Cm	centimetre(s)
CMP	corrugated metal pipe
CoR	City of Regina
Cplg	Coupling
CTR	centre
Cu	Copper
Culv	culvert
CW	cold water
<b>D</b>	
Dam <sup>3</sup>	cubic decameter
dB	Decibel
DBL	Double
Dc	direct current
Dft	dry film thickness
DIA	diameter
DIM	dimension
DL	deadload
DR	dimension ratio (SDR)
Dwg	drawing
DWV	drain, waste,vent (plastics-piping)

<b>E</b>	
ECRED	eccentric reducer
EHV	extra high voltage
EJCTR	ejector
ELL	elbow
EMT	electrical metallic tubing
EL	elevation
EPDM	Ethylene propylene Dienemonomer
<b>F</b>	
<sup>0</sup> F	fahrenheit degrees
FBM	board foot (foot-board measure)
F/C	Flanged by compression (coupling)
Fe	Iron
FF	flat-faced
FIP	found iron pin
FIPT	female iron pipe thread
FLG	Flange
FLTR	Filter
FM	Frequency modulation
F/O	fibre optic (cable)
FoC	face of curb
FS	forged steel
FSD	flat side down
FSL	full surface level
FSU	flat side up
ft	Foot
ft/min	foot per minute
ft/s	foot per second

<b>G</b>	
g	Gram
g/m <sup>2</sup>	Grams per square metre
ga	Gauge (NBC)
GALV	Galvanized
GR	guardrail
GRD	Electrical ground
GV	gate valve
<b>H</b>	
ha	Hectare
HDPE	High density polyethylene
hf	high frequency
HGL	Hydraulic grade line
hr	Hour
HRZ	Horizontal
Hp	Horsepower
HP	high pressure
HW	hot water
HYD	Hydrant
Hz	Hertz
<b>I</b>	
IF	inside fence
ID	inside diameter
Ig	Imperial gallons
Igpm	Imperial gallons per minute
In	inch(es)
INV	Invert
IP	iron pipe
IPS	Iron pipe size
IRR	irrigation box
<b>J</b>	
jb	Junction box
jr	Joint restraint (mechanical)
<b>K</b>	
kg	kilogram
KGV	knife gate valve



km	kilometre
km/h	kilometres per hour
kN	kilonewtons
kPa	kilopascals
kV	kilovolt
kVA	kilovolt ampere
kW	kilowatt
<b>L</b>	
l	litre
lb	pound
LC	length of curve
LIN	linear
LL	liveload
Lm	lumen
IP	low pressure
lpm	litres per minute
lps (1/s)	litres per second
LR	long radius
lx	lux
<b>M</b>	
m	metre
mA	milliamperes
MAX	maximum
m <sup>3</sup> /d	cubic metres per day
mg	milligram
MGD	million gallons per day
mg/l	milligrams per litre
MH	Manhole
MHR	Manhole rim (elev)
Migd	million imperial gallons per day
Mil	.001 inches
Min	minute(s)
MIN	minimum
misc	miscellaneous
MIPT	male iron pipe thread
MJ	megajoules
mm	millimetre
ML	megalitres
ML/d	megalitres per day
mPa	megapascals
m/s	metres per second

<b>N</b>	
N	Newton
N/A	Not Applicable
NC	Normally closed
NIC	not-in-contract
NO	Normally open
No(s)	Number(s)
NPT	National pipe thread
NTS	Not to scale
<b>O</b>	
oc	on-centre (dimension)
OD	Outside diameter
oto	outside to outside (dimension)
OV	Overflow
<b>P</b>	
Pa	pascal
Pb	lead
p-brg	pedestrian bridge
PE	Polyethylene
pH	hydrogen-ion concentration
PI	point-of-intersection
Pl	property line
POP	population
p-o/p	pedestrian overpass
pp	power pole
ppb	parts per billion
ppm	parts per million
Pt	Platinum
p-tun	pedestrian tunnel
PVC	polyvinyl chloride (plastics)
PWL	Pumping water level
<b>Q</b>	
Qty	Quantity
<b>R</b>	
R	Radius
RCP	reinforced concrete pipe
Rcl	Repair clamp
RED	reducer or reducing
RF	raised-face
RFF	raised face flange

rebar	reinforced bars
REQD	Required
RGE	Range
Rpm	revolutions per minute
RR	Railroad
RW	raw water
RoW	right-of-way
R.M.	rural municipality
RTW	retaining wall
RWL	rainwater leader
<b>S</b>	
S	second(s)
Sec	section
SAN	sanitary (sewer)
SCH	schedule
SM	survey monument
SPEC	specification
SPS	Sewage pumping station
Sq	square
SR	short radius
ss	storm sewer
SS	stainless steel
St.	street
ST	septic tank
STA	station
STD	standard
STPS	Stormwater pumping station
SW	switch
<b>T</b>	
tblk	thrust block
TDH	total differential head
Temp	temperature

thd	thread(ed)
THWRD	thaw rod
TLLD	total load
ToP	top of pipe (elev)
Twp	township
TYP	typical
<b>U</b>	
UG	underground
UHF	ultra high frequency
UV	ultraviolet
<b>V</b>	
V	volt
Vac	volts-alternating current
VC	Valve chamber
VCT	vittrified clay tile (pipe)
VERT	vertical
VHF	very high frequency
vol	Volume
<b>W</b>	
W	watt
WCB	water curb box
WL	water level
WOG	water, oil or gas
wt	wall thickness
WT	weight
<b>X</b>	
Xfmr	transformer
Xing	crossing
<b>Y</b>	
yd	yard

**2.0 PRODUCTS**

None in this Section

**3.0 EXECUTION**

None in this Section