PART 1 - **GENERAL**

1.1 Site Examination

.1 The Bidder must visit the site of work before submitting a Tender, and must make careful examination of the existing site surface conditions and topography, and notify the City in writing of unsatisfactory site surface conditions and topography prior to submitting the tender. Submission of the Tender will mean that the Bidder has accepted the existing site surface conditions and topography and no allowance will be made later for any expenses incurred through failure to note unsatisfactory existing site surface conditions and topography.

1.2 Hours of Work

.1 Work in this contract shall be performed during the hours of 7:00 a.m. to 7:00 p.m., Monday to Friday inclusive. Any work to be performed outside of these hours is to be approved in writing from the City`s Representative. The Contractor shall be aware of the City of Guelph by-laws pertaining to such work.

1.3 Regular Meetings

.1 The Contractor shall be required to attend regular meetings on site to review the progress of the Work with the City and the City's Representative. The dates and times for these meetings shall be determined at the first scheduled meeting for the Project. Refer to Section 01040.

.2 An initial pre-construction meeting will be held at the City of Guelph offices to review the approach to the project, introduce the various contact personnel involved in the project and to discuss the start up procedure, coordination details, specific project scheduling issues, and other related coordination requirements.

.3 The Contractor shall attend an on-site pre-construction meeting with representatives of the Grand River Conservation Authority, the City of Guelph, and the City's Representative to review and discuss erosion control and construction sequencing. The date and time of this meeting is to be determined.

.4 Emergency meetings will be held as required, and will be attended by the Contractor, as requested by the City's Representative.

.5 Should the date of Substantial Performance stated in the approved Construction Schedule be extended over a winter period, the Contract Price will remain valid until the revised date of Substantial Performance.

1.4 Restoration

.1 The contractor is responsible for damage caused to surrounding facilities, and for the protection of the public. Facilities damaged by the contractor shall be repaired and paid for in full by the contractor at no cost to the City to the satisfaction of Parks and Recreation Department.

.2 At all times, the contractor shall keep the site free from accumulations of debris and upon completion of each stage of work, remove from the site all equipment, surplus materials and rubbish resulting from such work.

.3 The Contractor is advised that no specific disposal site has been identified for materials surplus to this project. Therefore, it will be the Contractor's responsibility to arrange for a suitable disposal site(s) for all removals, excess, and waste materials generated by the work of this project. There will be no extra payment to the Contractor for the cost of disposing material off site.

1.5 Damage by Vehicles and Other Equipment

.1 If at any time, in the opinion of the Contract Administrator, damage is being or is likely to be done to any highway or any improvement thereon, other than such portions as are part of the work, the Contractor's vehicles or other equipment, whether licensed or unlicensed, the Contractor shall, on direction of the Contract Administrator and at the Contractor's own expense, make changes in or substitutions for such vehicles or other equipment or shall alter loading or shall in some other manner remove the cause of such damage to the satisfaction of the City.

.2 The Contractor shall protect all existing curbs and sidewalks. Prior to commencement of site works, photograph the condition of the existing curb and sidewalk and submit in writing to the Contract Administrator any existing damage. Failure to document existing damage as outlined will result in responsibility for the replacement of damaged areas at the Contractor's expense.

.3 The Contractor will also be responsible for the rectification any damage caused by his forces or subcontractors to the satisfaction of the City of Guelph Engineering Department.

1.6 Utilities

.1 Prior to commencing any excavation work, the contractor shall establish the location and state of use of all utilities or services.

.2 It is the Contractor's responsibility to obtain further information in regard to these utilities, and to exercise the necessary care in construction operations or take other precautions to safeguard the Utility from damage. The cost of all damages to utilities both overhead and underground, caused by the Contractor's operations, shall be borne by the Contractor.

1.7 Supervision

.1 The Contractor shall provide skilled and qualified supervisory staff on the project at all times to ensure proper execution of the work. The Contractor shall provide a qualified full time superintendent capable of communicating by both written and oral means to ensure that the work proceeds in a proper and efficient manner.

.2 If, in the opinion of the City's Representative, the assigned superintendent is not competent to carry out appropriate direction of the work, the Contractor shall replace the superintendent immediately upon written request of the City's Representative.

.3 All supervisory personnel who will be assigned to this project must be entirely familiar with the terms, conditions and details of the Contract and related documents.

1.8 Sub-contractors

.1 The Contractor shall employ Sub-contractors as required to complete the Work. Nothing in the Contract Documents shall be interpreted as the Owner having any contractual obligation or relationship to a Sub-contractor.

.2 A list of Sub-contractors whom the Contractor proposes to retain for this project must be completed by the Contractor. The Owner and the City's representative reserves the right to accept or reject and Sub-contractor at their discretion. No deviation from this list will be permitted during the performance of the Contract without permission from the Owner.

1.9 Use of the Site

.1 The Contractor shall confine all equipment, labour and materials to a pre-designated area within the limits of the site, except as may be otherwise permitted in writing by the City. The Contractor shall not park any equipment, material or staff vehicles on private property unless approved by the Owner through prior arrangement with the property owner.

.2 Due to the restrictive size of the areas for storage, the Contractor will be required to neatly stockpile enough material on-site as will permit continuous progress of the work.

1.10 Erosion and Sedimentation Control

.1 The Contractor is to be fully responsible to ensure that all erosion and sedimentation resulting from the proposed works, de-watering operations, etc. is controlled and contained within the work site to the satisfaction of the Contract Administrator. All existing drainage structure shall be protected with filter cloth. The filter cloth shall be removed upon substantial completion, or as directed by the Contract Administrator.

.2 Any clean up or damage costs resulting from the Contractor's failure to control erosion or siltation shall be completely at the Contractor's expense. At all times, the Contractor shall prevent entry of sediment to watercourses, woodlots and adjacent residences. Controls shall include, but not be restricted to, the following:

.1 Runoff from construction materials and stockpiles shall be contained and discharged so as to prevent entry of sediment to watercourse.

.2 Silt fences shall be installed along the perimeter of any approved stockpile locations on the sites, in addition to those shown on drawings as required. Silt fences shall be installed across truck access routes to the stockpile at the end of each workday.

.3 A 20 meter standby supply of prefabricated silt fence barrier, in addition to the existing silt fence barrier which is to be specified elsewhere in the Contract, shall be maintained at the Contract site prior to commencement of operations and throughout the duration of the Contract.

1.11 Project Layout

.1 The setting out of work shall be the responsibility of the contractor including all grades, lines, levels and dimensions as indicated on the drawings. Every effort has been made to quantify quantities provided in the form of tender. Any errors or discrepancies are to be reported to the owner's representative before the commencement of work.

1.12 Cut / Fill

.1 It is expected that the Work will require the cut and removal of fill, both topsoil and subsoil. Contractor shall remove and dispose of all fill to be removed from the site.

.2 The Contractor is to review existing conditions and cut and fill quantities prior to construction. Additional costs for earthworks will only be considered where quantities are measureable, for evaluation against the Form of Tender estimated quantities. In the absence of empirical measurement, the quantities listed in the Form of Tender shall be final.

.3 The Contractor shall grade the site as per the design grades, and excavate sufficient depth to provide the specified base for park features. Excavation and grading beyond these requirements are the sole responsibility of the contractor, save and except with the express written recommendation of the City.

1.13 Incidental Items

.1 The following is a partial list of items, the cost of which is to be included in the unit prices of the tender items unless a specific payment item is included in the Form of Tender. No additional payment will be made for the following:

.1 Cost of permits and fees.

.2 Cost of removing and/or relocating to a temporary or final location, when required by the City's Representative, small signs, fences, waste containers, or other minor obstructions interfering with the construction.

.3 Cost of attendance at site meetings and other emergency meetings that may be necessary over the course of the project to affect proper coordination, dealings with property owners, dealing with emergency situations, and other related meeting activities necessary.

.4 Cost of all dewatering as required.

1.14 Weighing

.1 Where units are measured by weight, weigh tickets shall be supplied by the Contractor showing the date, source of material, type of material, truck number, gross, tare and net weights, place of dumping, and providing spaces for the signature of the weigh man and the Contract Administrator.

.2 The truck driver shall deliver two (2) copies of the weight tickets filled in by the weigh man, to the Contract Administrator. Tickets shall be kept separate for each day and for each type of material weight. Measurement for payment of materials based on weight will be determined by the weigh ticket quantities.

1.15 Commencement and Completion

.1 Following contract award, the successful Bidder will be required to submit all required documents (bonding, insurance etc.) to the City, and sign the agreement within ten (10) working days.

.2 The official start date of Construction shall be noted as ten (10) days after Contract award or as soon as weather conditions permit in the **spring of 2013**, but no later than, **Tuesday, May 21st, 2013**. It shall be understood by all Bidders submitting bids as a result of this Tender call, that the City fully expects the successful Bidder to work continuously in order to complete all the Contract tasks as outlined in Specifications and drawings during the period indicated in the section 'Completion Date'.

.3 The successful Bidder shall not be permitted to stop work on the site without the express written consent of the City's Parks Planning Representative.

.4 The successful Bidder shall submit a Construction Schedule to the City for approval in horizontal bar chart format within ten (10) days of Award of Contract. The Construction Schedule must be in compliance with the requirements in the Completion.

.5 If the work is interrupted by extreme weather conditions, the Construction Schedule may be revised with the approval of the City. The successful Bidder's contract administrator shall document such weather conditions and propose to the City what revisions/extensions in the construction work schedule are necessary, and which would result in a revised project completion date.

.6 The successful Bidder shall employ sufficient equipment and workmen to complete the installation as expeditiously as possible. If, in the opinion of the City, the progress of the work of the successful Bidder does not, at any time, clearly demonstrate that completion of the installation will meet with the approval of the City, the City reserves the right to require the successful Bidder to employ such additional equipment and workmen as

required, to ensure that the Construction Schedule is adhered to, all without additional cost to the City.

1.16 Completion Date

.1 The work under this contract will be expected to be completed as stipulated in the approved Construction Schedule or as modified in accordance with the starting date and construction schedule. The City fully expects that the work for **CONTRACT # 13-041** will be completed in **forty-five (45)** working days from the official start date of construction.

1.17 Liquidated Damages

.1 It is agreed by the parties to the contract that in case all the work called for under the contract is not finished or completed within the date of completion specified in the approved Construction Schedule, damage will be sustained by the Corporation and that it will be impractical and extremely difficult to ascertain and determine the actual damage which the Corporation will sustain in the event of and by reason of such delay and the parties hereto agree that the successful Bidder will pay to the City the sum of **$500.00 per day** for liquidated damages for each and every working day's delay in finishing the work beyond the date of completion prescribed and it is agreed that this amount is an estimate of actual damage to the corporation which will accrue during the period in excess of the prescribed date of completion.

The City may deduct any amount under this paragraph from any monies that may be due or payable to the successful Bidder or any account whatsoever. The liquidated damages payable under this paragraph are in addition to and without prejudice to any other remedy, action or other alternative that may be available to the City.

1.18 Progress Payment

.1 The City's Representative will review an application for payment from the successful Bidder no later than ten (10) days after the date of receipt of the application for payment and will issue a request for payment in the amount applied for or in such other amount as the City's representative determines to be properly due. If the City's representative amends the application, the City's representative will promptly notify the successful Bidder in writing giving reasons for the amendment.

.2 The City shall make payment to the successful Bidder on account no later than (30) days after the date of receipt by PARKS PLANNING AND DEVELOPMENT *OF THE ORIGINAL APPROVED* application for payment from the successful Bidder.

1.19 Substantial Performance and Holdback Release

.1 When the contract is duly completed, in accordance with the Terms of the Contract, the City will pay to the Contractor eighty-five percent (85%) of the contract value.

.2 The City will issue a Certificate of Substantial Performance. The Contractor will be required to publish this Certificate in the Daily Commercial News. The 45 day lien period

will commence from the date of publication. Forty-five (45) days after the date of publication or as soon as practical thereafter, and upon receipt of the Certificate of Publication, a satisfactory Clearance Certificate from the Workers' Compensation Board and a Statutory Declaration that all liabilities incurred by the Contractor and his sub-contractors in carrying out the contract have been paid and that there are no liens, garnishes, attachments or claims relating to the work, the City will make a holdback reduction from 15% to 5% in accordance with the current terms of the Province of Ontario Construction Lien Act (Bill 216). The 5% holdback will be held for the 24-month warranty period which shall begin on the date of substantial completion.

1.20 Final Completion and 5% Holdback Release

.1 The City will establish final completion of the contract following the 24-month warranty period and release the 5% warranty holdback provided the provisions of the contract have been fully complied with and upon receipt of the following:

.2 A Statutory Declaration that all liabilities incurred by the Contractor and his Sub-contractors in carrying out the contract have been paid and that there are no liens, garnishes, attachments or claims relating to the work. A satisfactory Clearance Certificate from the Workers' Compensation Board.

1.21 As- Constructed Survey

.1 As part of the submittals, the Contractor shall be responsible to provide the City with an AutoCAD file of a legal as constructed survey indicating all servicing, culverts, structure inverts and spot elevations indicated on the Contract Drawings. The survey must be prepared by an OLS, and digital files shall be submitted prior to issuance of Substantial Completion.

1.22 Warranty

.1 The warranty period for this Contract is two (2) years from the date of Substantial Performance of the Work. The successful Bidder shall be responsible for the proper performance of the Work to the extent that the design and Contract Documents permit such performance. 'The successful Bidder warrants that the work is in compliance with the requirements of the Contract Documents'. the successful Bidder shall correct promptly, at the Bidder's expense, defect or deficiencies in the Work which appear prior to and during the warranty periods specified in the Contract Documents. The City, through the City's representative, shall promptly give the successful Bidder notice in writing of observed defects and deficiencies that occur during the warranty period. The successful Bidder shall be responsible for obtaining Products warranties from respective manufacturers in excess of two years on behalf of the City, where such warranties are required and/or offered by the manufacturer. These product warranties shall be issued by the manufacturer to the benefit of the City. The successful Bidder shall warranty the quality of workmanship and materials for a period of twenty-four (24) months from the date of acceptance, and make any repairs or replacements as required by the owner without delay. the decision of the City shall be final as to the nature and imperfection of warrantee work, and the necessary remedy of same. If after seven (7) days notice, the contractor fails to carry out any repairs as directed by the owner, the owner may

proceed with such and charge the same against the contractor's holdbacks.

1.23 Plant Material Unit Prices

.1 The Contractor shall provide within the tendered unit prices, all required costs for obtaining, installing, maintaining and warranting all plant material for 2 years. In particular, these costs shall be inclusive of: initial acquisition costs; any premiums for obtaining spring dug material; carrying, storage and handling; root ball over sizing; and any other charges that may be necessary to ensure a totally complete project within the allotted construction schedule.

.2 Should limited availability of plant material be an issue, the Contractor is required to provide unit prices for these items that reflect reasonable acquisition costs based on published catalogue prices. In the event that substitutions are required, they will be made on a pro-rata basis using these catalogue prices as a guide to reasonable adjustments to \in the contract unit prices.

1.24 Hot Mix Asphalt Pricing Based on Performance Graded Asphalt Cement (PGAC) Price Index

.1 The City of Guelph will adjust the payment to the Contractor based on changes to the Ministry of Transportation's (MTO) PGAC price index. The price index will be published monthly in the MTO Contract Bulletin and displayed on the OHMPA (www.ohmpa.org) and MTO website (www.raqs.mto.gov.on.ca). The price index will be used to calculate the amount of the payment adjustment per tonne of new asphalt cement accepted into the Work.

.2 The price index will be based on the price, excluding taxes, FOB the depots in the Toronto area, of asphalt cement grade PG 58-28 or equivalent. One index will be used to establish and calculate the payment adjustment for all grades. As of July 2006 the price index for each month will reflect the average of the same month's prices and be published on the last day of the month and be retroactively applied to HMA laid in the same month.

.3 A payment adjustment per tonne of new asphalt cement will be established for each month in which paving occurs when the price index for the month differs by more than $15.00/tonne from the AC price index for the month prior to tender opening. When the price index differential is less than $15.00/tonne, there will be no payment adjustment for that month. Payment adjustments due to changes in the price index are independent of any other payment adjustments made to the hot mix tender items. HST adjustment should be applied to the adjustment (either way).

.4 The payment adjustment per tonne will apply to the quantity of new asphalt cement in the hot mix accepted into the Work during the month for which it is established. The payment adjustment for the month will be calculated by the following means:

.1 When AC Prices are Rising by more than a $15.00/tonne difference: the payment adjustment to be paid to the Contractor is the result of subtracting the price index for the month prior to tender opening from the price index in effect when paving took

place, minus the $15.00 float, multiplied by the number of tonnes of PGAC incorporated in the mix(s) as determined by the job mix formula. HST on the adjustment will be included.

.2 When AC Prices are Falling by more than $15.00/tonne difference: the payment adjustment made in favour of the Owner is the result of subtracting the price index in effect when paving took place, plus $15.00 float from the price index for the month prior to the tender opening, multiplied by the number of tonnes of PGAC incorporated in the mix(s) as determined by the job mix formula. HST on the adjustment will be included.

.5 The quantity of new asphalt cement includes all grades of asphalt cement supplied by the Contractor with and without polymer modifiers. For each month in which a payment adjustment has been established, the quantity of the escalation/de-escalation will be calculated using the hot mix quantity accepted into the Work and its corresponding asphalt cement content as required by the job mix formula except for mixes which contain reclaimed asphalt pavement.

.6 For mixes which contain reclaimed asphalt pavement, the increase due the contractor or the rebate due the owner will be calculated as if virgin hot mix asphalt has been supplied. This fairly reflects the increasing value of the Contractor's RAP pile when AC prices are increasing and the opposite when they are declining.

.1 Example 1 – AC Prices Increasing:

PGAC 58-28 specified, 3,000 tonnes of HL3 @ 5.2% AC (156.0 tonnes AC).

The effective Price Index on July 17, 2006 on tender opening is $433.80 (June, 2006)/tonne (PG 58-28)

The applicable Price Index as published on August 31st effective for the August 17-24 2007 actual paving dates is $504/tonne (PG 58-28)

Payment adjustment to be paid to the Contractor:
($504 - $15) - $433.80 x 156 tonnes AC = $55.20 x 156 tonnes AC = $8611.20 + 13% HST

.2 Example 2 – AC Prices Decreasing:

PGAC 58-28 specified, 4,500 tonnes of HL8 @ 4.6% AC (207.0 tonnes AC)

The effective Price Index on May 5, 2007 on tender opening is $508.60 (April, 2007)/tonne (PG 58-28)

The applicable Price Index as published on October 31 effective for the October 11-18, 2007 actual paving dates is $451.35/tonne (PG 58-28)

Payment for hot mix items reduced by:

$508.60 – ($451.35+$15) x 207 tonnes AC = $42.25 x 207 tonnes AC = $8745.75 + 13% HST

.3 Notes:

.1 Contractors should bid the hot mix asphalt item using the cost of the grade of PGAC specified.

.2 The AC Price Index is only a tool for qualifying hot mix prices and is not intended as a standard AC price to be incorporated into the contract bid.

.3 The payment adjustment calculated using this formula is full compensation for any and all PGAC grades specified.

.4 If the AC Index has not changed more than $15.00 per tonne up or down, no adjustment is required. Only the amount of the change that is greater than $15.00 is used to calculate payment adjustments.

.5 Beginning with the AC Index for July 2006 MTO will amend their past practice of establishing the monthly index amount on the 1st day of the month from the average of the four weekly AC prices received in the previous month to a calculation that takes in the average of the four weeks of the current month and is subsequently published on the last day of that month.

Past Practice Before August 2006:

The index for June is the result of the AC prices received in May and published June 1st.

New Standard:
The index for July is the result of AC prices received in July and published July 31.

For qualifying payment adjustments on the priced of HMA the contractor will seek/give a HST adjustment on the total value because Ontario collects a levy of 13% HST on the total manufacturing costs of every tonne of HMA produced.

.6 As the result of the implementation of Note #4 and the subsequent issue of MTO SP 103820 the AC Price index for the month prior to tender opening will be used as the AC bid price to calculate AC adjustments.

.7 Measurement for Payment

Measurement shall be per tonne as evidenced by weigh scale tickets from an approved weigh scale (per OPSS 102 and MTO SP101S18).

.8 Basis of Payment

Payment made under this item(s) shall be in accordance with OPSS 310.10 and shall include power sweeping or air cleaning the surface, *removal of all dirt and foreign*

material, removing asphalt ramps, constructing asphalt ramps, applying bond breaker material, applying joint painting material, installation of shoulder treatments, ramping of catch basins in concrete curb and gutter extending into the roadway beyond the curb line, all hand-placed asphalt as part of the roadway, all machine-laid asphalt paving, cleaning of castings, installation of hand-formed curb around catch basins at low points when specified or where concrete curb and gutter has been left out to be completed at a later date, and the provision of a detailed asphalt placement plan.

The unit price for the surface asphalt items shall include the removal of binder course asphalt used as ramping at the paving limits, and at gutters along pedestrian curb ramps, adjustment of new manhole tops to final elevations and sweeping clean all road surfaces prior to the placing of the asphalt which is to be applied prior to completion of this Contract.

END OF SECTION

PART 1 - GENERAL

1.1 General

.1 All submissions under this section shall bear the project name, Owner's name and Bid No., the Landscape Architect's Project No., and complete support data.

1.2 Valuation of Changes in the Work

.1 The method to be used in determining the value of a change to the contract work shall be:

.1 Estimate and acceptance in a lump sum showing a breakdown of labour and material, unless the City's Representative otherwise determines that the method shall be one of:

.1 Unit prices set out in the Contract.

.2 Cost and a fee.

.3 Time and material.

.2 Where methods 1.2.1.1 or 1.2.1.2 are used the Contractor shall provide the City's Representative with a detailed cost analysis of the contemplated change indicating:

.1 Quantity of each material.

.2 Unit cost of each material.

.3 Time involved.

.4 Subtrade quotations including a complete analysis of costs.

.5 Markups, if applicable.

.6 Value of HST and PST as applicable.

.7 Proposed change in Contract Time.

.3 Where method 1.2.1.3 is used, propose a fee, and a method for determining cost, and any proposed change in Contract Time.

.2 Do not proceed with changes until authorized by written change order, signed by the Owner and the City's Representative.

.3 The percentage fee for markups shall be as stated in Clause 1.3.

.4 In computing accounts for extras and credits for any Change Notices, all credits shall be deducted from the total sum of the extras before markups or charges for overhead and profit are added.

.5 Labour costs shall be calculated as not more than the wages paid the labourer plus employer's contributions to benefits plus mark-ups. On request of City's Representative, submit proof of wages and benefits applicable to personnel involved.

.6 The Contractor shall inform the Surety Company or Companies who have issued any bonds for this Contract, and any Insurers who have insured any part of the work or operations or who have an interest in this Contract, of all changes in the Contract if they exceed 10% of the original contract. Pay any additional costs of any changes in bonds or insurances required to maintain bonds or insurances in conformance with the requirements of the contractor Documents and provide Owner immediately with any revised bonds or insurances and proof of any increases in premiums.

1.3 Permitted Markups

.1 The following net mark-ups will be permitted for extra work not including GST.

.1 The Contractor on work of their own forces on extras: 5% overhead, 5% profit, total 10% combines.

.2 Subcontractors on extras: 5% overhead, 5% profit, total 10% combined.

.3 The Contractor on work of subcontractors: 5% profit.

.2 When calculating credits, 50% of the above markups shall be credited to the Owner.

.3 The allowance for the Contractor's and Subcontractor's overhead shall include all site and office overhead.

1.4 Applications for Payment and for Certificates

.1 Progress applications.

.2 Progress applications for payment shall indicate the value complete of each item in the Schedule of Values, percentage complete to date of application, value previously certified for payment by the City's Representative, and value of work remaining. All values shall be exclusive of GST, except that GST shall be applied to the total amount claimed, and the value of GST indicated on the application.

.3 In addition to other requirements, progress applications shall indicate the cost of the following items as separate items:

.1 Bonds.

.2 Insurances.

.3 Temporary facilities and controls.

.4 Contract closeout, as-built drawings, maintenance manuals.

.4 Progress applications claiming monies against cash allowances shall be accompanied by true copies of all invoices and statements from suppliers or subcontractors furnishing products, etc., purchased under a cash allowance.

.5 Second and subsequent applications for payment shall be accompanied by a duly signed Statutory Declaration on CCA Form OB and valid Workplace Safety and Insurance Board Certificate of Clearance dated not later than the date of the progress application.

.6 All applications for payment must include an updated computer generated progress schedule.

.7 All applications for payment and applications for a Certificate of Substantial Performance shall be accompanied by a Certificate of Clearance from the Workplace Safety and Insurance Board dated no earlier than the last day of the month for which the progress claim is made, or the date of the application for a Certificate of Substantial Performance.

.8 Applications for a Certificate of Substantial Performance, lien fund releases, Statement of Completion shall be completed in accordance with OAA/OGCA Document 10 Takeover Procedures, and shall be accompanied by the appropriate CCA Statutory Declaration, duly executed, and a Certificate of Clearance from the Workplace Safety and Insurance Board. In Document 100, substitute “City’s Representative” for “Architect”, and “review “for inspection where it appears in relation to the City’s Representative’s assessment of the Work.

1.5 Lien Holdback Release

.1 Holdback monies will be released in accordance with applicable legislation.

.2 A Certificate for Payment of substantial performance lien holdback funds will only be made upon receipt by the City’s Representative of proof of publication of the Certificate of Substantial Performance from the publishing newspaper.

.3 Where the Contractor does not publish the Certificate of Substantial Performance within 10 calendar days of the City’s Representative’s issuance of the Certificate, the Owner may, at the owner’s sole discretion, publish the Certificate of Substantial Performance,

deducting the cost of the publication from the Contract Price. Cost of publication will include the advertising fees, plus Owner's and City's Representative's labour costs charged at regular hourly rates for time involved in arranging publication. Where there are no regular hourly rates, costs shall be charged at hourly salary or wages multiplied by 3.

1.6 Application for Certification of Completion of a Subcontract and Early Release of Holdback

.1 Certification of completion of a subcontract may be made by the City's Representative, at the City's Representative's sole discretion, upon written application by the Contractor. Obtain City's Representative's permission to make application for early release of holdback monies prior to making written application.

.2 The City's Representative may refuse to certify a subcontract as complete, without offering reason.

.3 The Contractor's application for a Certificate of completion of a subcontract shall include:

.1 A statement to the Owner through the City's Representative to the effect that the subcontract is fully complete in all respects, including but not limited to submission of all data, operating instructions, maintenance manuals, record drawings, spare parts and materials, evidence of all tests, guarantees, etc., as required for the subcontract.

.2 A certified copy of the Contract between the Contractor and the Subcontractor whose work has been completed.

.3 A list of the extent of approved additions to, or deletions from, and revisions to the work of the Subcontractor.

.4 A statement showing the amount of holdback monies due for release and payment the subcontractor following issue of a Certificate of Completion of a Subcontract.

.5 Declaration of last supply by the Subcontractor as prescribed in subs Section 31(5) of the Construction Lien Act (Form 5).

.6 Contractor's written acknowledgement that the terms of the Contract remain unaltered by the early release of the holdback of the completed subcontracts.

.7 Confirmation that the bonding company has been notified of the intent to claim early release of holdback monies.

.8 Workplace Safety and Insurance Board's interim certificate of clearance.

.4 Where the City's Representative has agreed to accept an application for early release of holdback, and upon satisfactory receipt of all documentation required in item 4 above, the City's Representative shall, review the work within ten (10) working days. If satisfied that all work under the particular subcontract has been properly completed, the City's Representative shall issue a certificate to the Owner, Contractor, and subcontractor within seven (7) working days of the date of completion of the work. The date of completion shall be noted by all parties.

.5 The Contractor shall then issue, over the signature of one of its officers, a statutory declaration to the Owner, stating:

.1 That no written notices of liens have been received by them.

.2 That they have paid the Subcontractor in full, except for construction lien holdback.

.3 The final net amount of the subcontract and the amount owing.

.6 The Subcontractor shall issue, simultaneously, and over the signature of one of its officers, a statutory declaration to the Contractor stating:

.1 That no written notices of liens have been received by them.

.2 Their own Suppliers and Subcontractors are listed completely in the declaration.

.3 That they have received payment in full, except for construction lien holdback.

.4 The final net amount of the subcontract and the amount owing.

.5 That they have received the certificate issued by the City's Representative pursuant to Section 33 (1) of the Construction Lien Act.

.6 The Subcontractor shall provide releases from the Workplace Safety and Insurance Board on their own behalf and on behalf of its Subcontractors and Suppliers.

.7 The Certificate for Payment of holdback monies will not be issued until all of these documents are delivered by the Contractor to the City's Representative.

.8 Upon expiry of the lien period provided for in the Construction Lien Act, and provided that:

.1 No liens or certificates of action are preserved;

.2 All documents have been received;

.3 No oral or written notices of lien claims or unpaid Subcontractors, Subsubcontractors, or suppliers have been received by the Owner; the Owner shall then make payment to the Contractor on the basis of the City's Representative's Certificate for Payment.

.9 Notwithstanding the Certification of Completion of a Subcontract and related Certificates for Payment enabling the Contractor to obtain a related Certificates for Payment enabling the Contractor to obtain a reduction in the holdback monies, and notwithstanding the wording of such certificates, the Contractor shall protect the work of the subcontractors pending completion of the entire work and shall correct any defects in it regardless of whether or not the defects were apparent when such certificates were issued.

.10 Be advised that early release of holdback monies does not affect the commencement date of warranty requirements of the Contract, and that the warranty period of the subcontract commences on the date of substantial performance of the (prime) Contract between the Owner and the Contractor.

PART 2 - PRODUCTS

2.1 Not used.

PART 3 - EXECUTION

3.1 Not used.

END OF SECTION

PART 1 - GENERAL

1.1 Subdivision of Work

.1 The Specification has generally been divided into sections for the purpose of ready reference, but a section may consist of the work of more than one trade, subcontractor and suppliers.

.2 The responsibility for determining which subcontractor or supplier provides labour, material, equipment and services to complete the work rests solely with the General Contractor, herein referred to as the Contractor.

.3 It is solely the responsibility of the General Contractor for determining the lines of demarcation between contractors and/or trades. The City's Representative assumes no responsibility for any such determination or for any dispute arising concerning it.

.4 No extras will be allowed on grounds of differences of interpretation of Contract Documents as to which subcontractor or supplier shall provide which labour, material, equipment or service.

1.2 Contractor's Responsibilities

.1 Contractor shall ensure that work erected is in compliance with Contract Documents and shall be responsible for delays or costs resulting from failure to inspect or coordinate, and for any replacement or corrective work required.

.2 Contractor shall be fully responsible for coordinating all trades, coordinating construction sequences and schedules, and coordinating actual installed location and interface of all work.

1.3 Superintendence

.1 Provide at site at all times while work is being performed, qualified personnel and supporting staff with proven experience in erecting, supervising, testing and adjusting projects of comparable nature and complexity.

1.4 Field Engineering

.1 Employ a qualified, registered land surveyor, acceptable to the City, to establish base lines and overall dimensions and to maintain lines and levels during construction, based upon acceptable bench marks.

.2 Owner will establish lot lines and the grades on the plot plan and these are furnished in good faith, but the Contractor shall check same and be responsible for the accuracy of all layout work dependent upon them. Verify all levels.

.3 Levels and other such information which may be furnished are given in good faith for the guidance of the Contractor, but shall in no way relieve them of responsibility for ascertaining to their own satisfaction the nature of all conditions at the site. No compensation for additional work will be provided for their failure to verify same.

.4 Make such Subtrade responsible for the work performed from elevations they have accepted from previous trades. Make the necessary adjustments in consultation with the City's Representative to provide finished work which is plumb and true in every respect.

.5 Locate, confirm and protect control points prior to starting site work. Preserve permanent reference points during construction. Establish lines and levels and lay out by instrumentation.

1.5 Cooperation

.1 Take field dimensions relative to work. Fabricate and erect work to suit field dimensions and field conditions.

.2 Provide all forms, templates, anchors, sleeves, inserts and accessories required to be fixed to or inserted in the work and set in place or instruct separate sections as to their location.

.3 Supply all items to be built in as and when required together with templates, measurements, shop drawings and other related information and assistance.

.4 Pay the cost of extra work and make up the time lost as the result of failure to provide necessary information and items to be built in, in adequate time.

1.6 Coordination

.1 Ensure that subcontractors cooperate with each other so that work will be carried out expeditiously and will be satisfactory in all respects at completion.

.2 Ensure that subcontractors examine Contract Documents with particular emphasis to work of other subcontractors which may affect performance of their own work.

.3 Regularly examine the site work of subcontractors and report any defects or deficiencies. Ensure that minor adjustments are performed to allow adjustable work fit to fixed work of other subcontractors.

.4 In the absence of any such report, Contractor shall be held responsible for all claims for damage or defects in work.

.5 Ensure that subcontractors requiring foundations or openings to be left for installation of their work furnish necessary information to subcontractors concerned in ample time so that proper provision can be made.

.6 Ensure that items to be built in are supplied as and when required by Contractors building in the items, together with templates, measurements, setting drawings or shop drawings and other related information and assistance.

.7 Ensure that equipment and/or material installed but not coordinated with the work of other subcontractors is relocated, as directed by City's Representative, without increasing contract price.

.8 Ensure each subcontractor maintains their own quality assurance program.

1.7 Coordination Meetings

.1 On prescribed dates, to be agreed after commencement of work, Contractor shall organize coordination meetings and advise all persons whose attendance is required of the time and place. Provide a proposed schedule for City's Representative's review prior to first meeting, and give City's Representative minimum 36 hours advance notice of each meeting by way of meeting agenda.

.2 Senior representatives of the City, City's Representative, Contractor, Subcontractors and key material suppliers as designated shall meet at a pre-determined location, with attendance by all parties on dates and at time agreed being a prerequisite.

.3 Contractor's senior representative shall chair the meetings, take note of persons in attendance and shall, within three days after each meeting, FAX , courier or personally distribute copies of minutes of meeting to all parties, which records decisions, comments and instructions required, and compile reports of schedules and progress of each section of work. Prepare written memoranda on required coordination activities, including such items as required notices and reports. Distribute to separate contractors where interfacing of work is required.

.4 These meetings are intended for, and shall provide a forum for discussion, by all parties, of all matters pertaining to the orderly review of the progress of the work and to provide a systematic discussion of problems related to performance, scheduling, sequencing and other items which may (or have) influenced the work process. Contractor's relations with subcontractors and suppliers are not part of meeting's purpose.

.5 Format of progress meetings shall encompass the following:

.1 Review and approval of minutes of previous meeting;

.2 Review of progress of work, progress schedule and status of submittals;

.3 Identification of problems which impede planned progress;

.4 Development of corrective measures and procedures to maintain planned schedule, and

.5 Other current business.

.6 Advice, direction, or confirmation included in minutes of these meetings, will be deemed to be written instructions, and shall be accepted and implemented by Contractor. Written instructions from City's Representative will be issued only to Contractor and the Owner.

1.8 Remedial Work

.1 Execute cutting, fitting, and patching to complete the Work.

.2 Remove and replace defective and non-conforming Work.

.3 Restore Work with new products in accordance with requirements of Contract Documents.

.4 Execute Work by methods to avoid damage to other work and which will provide proper surfaces to receive patching and finishing.

.5 Employ original installer to perform cutting and patching for exposed or visible materials.

.6 Refinish surfaces to match adjacent finishes: For continuous surfaces refinish to nearest intersection; for an assembly, refinish entire unit.

1.9 Locations of Items Not Dimensioned

.1 The location of trails, armourstone seating, signs shown or specified but not dimensioned shall be considered approximate.

.2 Confer with City's Representative prior to installation to determine the actual location of items not dimensioned as may be required to suit the job conditions.

.3 Relocate as directed within 6000mm plus or minus horizontally. Do such relocation without increasing Contract Price.

1.10 Dimensions

.1 Verify all dimensions on site before commencing shop drawings. Before fabrication commences report all discrepancies to City's Representative in writing. Incorporate accepted variances and record, along with particular items having been revised, on shop drawings and as-built records.

.2 Where dimensions are not available before fabrication is commenced, the Contractor and the subcontractors concerned shall agree in writing upon dimension required.

.3 Verify that work, as it proceeds, is executed in accordance with dimensions and positions indicated which maintain levels and clearances to adjacent work, as set out in accordance with requirements of drawings and specifications, and ensure that work installed in error is rectified before construction continues.

.4 All thicknesses shown on drawings are nominal only. Ascertain actual size on site.

.5 Owner will accept no claims for extra expense on the part of Contractor by reason of noncompliance with this Article.

PART 1 - PRODUCTS

2.1 Not used.

PART 2 - EXECUTION

3.1 Not used.

END OF SECTION

PART 1 GENERAL

1.1 References and Codes

.1 Conform to the latest edition of the following regulatory requirements, hereinafter referred to as codes:

.2 The Ontario Building Code; also known as Ontario Regulation 413/90 (as amended).

.3 The Ontario Fire Code; also known as Ontario Regulation 67/87 (as amended),

.4 The Construction Safety Act; also known as Ontario regulation 730/81 (as amended).

.5 The Occupational Health and Safety Act (Construction Projects); also known as Ontario regulation 213191 (as amended).

.6 The Workplace Hazardous Materials Information System Regulation (WHMIS); also known as Ontario Regulation 644/88.

.7 Conform to the requirements of all authorities having jurisdiction, including public utilities.

.8 Nothing contained in the Contract documents shall be so construed as to be in conflict with any law, by-law, or regulation of the municipal, regional, provincial, or other Authorities Having Jurisdiction. Perform all work in conformity with all such regulatory requirements.

1.2 Permits and Fees

.1 Determine detailed requirements of Authorities having jurisdiction. Give and post all notices and comply with laws, ordinances, rules and regulations hearing on conduct of work.

.2 Ensure permit to complete the Work has been issued from the Grand River Conservation Authority.

.3 Reference Standards:

.1 Where edition date is not specified, consider that references to manufacturer's data, and published codes, standards and specifications are made to the latest edition or revision, approved by the issuing organization.

.2 Reference standards and specifications are quoted to establish minimum standards. Work which in quality exceeds the specified minimum will be considered to conform.

.3 The requirements of the Contract Documents govern over the requirements of reference standards and specifications.

.4 Standards, specifications, associations and regulatory agencies are generally referred to throughout the Contract Documents by their abbreviated designations, as listed below:

.1 ASTM American Society of Testing and Materials.

.2 CSA Canadian Standards Association.

PART 2 PRODUCTS

2.1 Not used.

PART 3 EXECUTION

3.1 Not used.

END OF SECTION

PART 1 GENERAL

1.1 Related Sections

.1 Section 01140 Work Restrictions.

1.2 Work Covered by Contract Documents

.1 Work of this Contract comprises general construction of Watson Creek Trail, located east of Watson Parkway North between Grange Road and Watson Road along Clythe Creek in the City of Guelph.

1.3 Contract Method

.1 Construct Work under unit price contract.

1.4 Work by Others

.1 Work of Project executed during Work of this Contract, and which is specifically excluded from this Contract:

.1 Planting within trail corridor.

.2 Insure that Work avoids encroachment into areas required for Work by other Contractors.

.3 Co-operate with other Contractors in carrying out their respective works and carry out instructions from City's Representative.

.4 Co-ordinate work with that of other Contractors. If any part of work under this Contract depends for its proper execution or result upon work of another Contractor, report promptly to City's Representative, in writing, any defects which may interfere with proper execution of Work.

1.5 Work Sequence

.1 Construct Work in stages to accommodate Owner's continued use of premises during construction.

.2 Coordinate Progress Schedule and coordinate with Owner Occupancy during construction.

.3 Construct Work in stages to provide for continuous public usage. Do not close off public usage of facilities until use of one stage of Work will provide alternate usage.

.4 Maintain fire access/control.

1.6 Access and Egress

.1 Design, construct and maintain temporary "access to" and "egress from" work areas, independent of finished surfaces and in accordance with relevant municipal, provincial and other regulations.

1.7 Contractor Use of Site

.1 Contractor shall limit use of site for Work, for storage of materials in designated areas, and for access, to allow;

.1 Work by other contractors.

.2 Public usage.

.2 Coordinate use of site under direction of Owner and City's Representative.

.3 Execute work with least possible interference or disturbance to normal use of premises. Make arrangements with City's Representative to facilitate work as stated.

.4 Where security is reduced by work, provide temporary means to maintain security.

.5 Obtain and pay for use of additional storage or work areas needed for operations under this Contract.

.6 Remove or alter existing work to prevent injury or damage to portions of existing elements which remain.

.7 Repair or replace portions of existing work which have been altered during construction operations to match existing or adjoining elements, as directed by City's Representative.

.8 At completion of operations, condition of existing work to be equal to or better than that which existed before new work started.

1.8 Existing Conditions

.1 Notify City's Representative and utility companies of intended interruption of services and obtain required permission.

.2 Where Work involves breaking into or connecting to existing services, give City's Representative 48 hours notice for necessary interruption of mechanical or electrical service throughout course of work. Minimize duration of interruptions. Carry out work at times as directed by governing authorities with minimum disturbance.

.3 Provide alternative routes for personnel and vehicular traffic.

.4 Establish location and extent of service lines in area of work before starting Work. Notify City's Representative of findings.

.5 Provide adequate bridging over trenches which cross sidewalks or roads to permit normal traffic.

.6 Where unknown services are encountered, immediately advise City's Representative and confirm findings in writing.

.7 Protect, relocate or maintain existing active services. When inactive services are encountered, cap off in manner approved by authorities having jurisdiction.

.8 Record locations of maintained, re-routed and abandoned service lines.

1.9 Documents Required

.1 Maintain at job site, one copy of each document as follows:

.1 Contract Drawings.
.2 Specifications.
.3 Addenda.
.4 Reviewed Shop Drawings.
.5 List of Outstanding Shop Drawings.
.6 Change Orders.
.7 Other Modifications to Contract.
.8 Field Test Reports.
.9 Copy of Approved Work Schedule.
.10 Health and Safety Plan and Other Safety Related Documents.
.11 Other documents as specified.

PART 2 PRODUCTS

2.1 Not used.

PART 3 EXECUTION

3.1 Not used.

END OF SECTION

PART 1 GENERAL

1.1 Schedules Required

.1 The Contractor shall submit Construction Schedule including milestones for each major item of work or operation :

.1 Shop drawings and product data.
.2 Samples.
.3 Product delivery schedule.
.4 Shutdown and closure activity.

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

1.2 Format

.1 Prepare schedule in the form of a horizontal Gantt bar chart.

.2 Provide a separate bar for each major item of work or operation.

.3 Format and identification for listings to correspond with the *Schedule of Contract Unit Prices.*

1.3 Submission

.1 Submit Construction Schedule at the pre construction meeting.

.2 The City will review schedule and return the reviewed copy for revisions.

.3 Resubmit finalized schedule within 5 days after return of review copy.

.4 Distribute copies of revised schedule to:

.1 City.
.2 City's Representative.
.3 Subcontractors.
.4 Other concerned parties.
.5 Instruct recipients to report to Contractor immediately, any problems anticipated by timetable shown in schedule.

1.4 Progress Photographs

.1 Submit electronic copy of colour digital photography in .jpg format, standard resolution.

.2 Identification: name and number of project and date of exposure indicated.

.3 Frequency: monthly with progress payment claim and prior to backfilling any underground work.

PART 2 PRODUCTS

2.1 Not used.

PART 3 EXECUTION

3.1 Not used.

END OF SECTION

PART 1 - GENERAL

1.1 Submittals

.1 Shop drawings and product data.

.2 Samples.

1.2 Administrative

.1 Submit to City's Representative submittals listed for review. Submit with reasonable promptness and in orderly sequence so as to not cause delay in Work. Failure to submit in ample time is not considered sufficient reason for an extension of Contract Time and no claim for extension by reason of such default will be allowed.

.2 Work affected by submittal shall not proceed until review is complete.

.3 Present shop drawings, product data, samples and mock-ups in SI Metric units.

.4 Where items or information is not produced in SI Metric units converted values are acceptable.

.5 Review submittals prior to submission to City's Representative. This review represents that necessary requirements have been determined and verified, or will be, and that each submittal has been checked and co-ordinated with requirements of Work and Contract Documents. Submittals not stamped, signed, dated and identified as to specific project will be returned without being examined and shall be considered rejected.

.6 Notify City's Representative, in writing at time of submission, identifying deviations from requirements of Contract Documents stating reasons for deviations.

.7 Verify that field measurements and affected adjacent Work are coordinated.

.8 Contractor's responsibility for errors and omissions in submission is not relieved by City's Representative's review of submittals.

.9 Contractor's responsibility for deviations in submission from requirements of Contract Documents is not relieved by City's Representative review.

.10 Keep one reviewed copy of each submission on site.

1.3 Shop Drawings and Product Data

.1 The term "shop drawings" means drawings, diagrams, illustrations, schedules, performance charts, brochures and other data which are to be provided by Contractor to illustrate details of a portion of Work.

.2 Indicate materials, methods of construction and attachment or anchorage, erection diagrams, connections, explanatory notes and other information necessary for completion of Work. Where articles or equipment attach or connect to other articles or equipment, indicate that such items have been coordinated, regardless of Section under

which adjacent items will be supplied and installed. Indicate cross references to design drawings and specifications.

.3 Allow 14 days for City's Representative's review of each submission.

.4 Adjustments made on shop drawings by City's Representative are not intended to change Contract Price. If adjustments affect value of Work, state such in writing to City's Representative prior to proceeding with Work.

.5 Make changes in shop drawings as City's Representative may require, consistent with Contract Documents. When resubmitting, notify City's Representative in writing of any revisions other than those requested.

.6 Accompany submissions with transmittal letter containing:

.1 Date.

.2 Project title and number.

.3 Contractor's name and address.

.4 Identification and quantity of each shop drawing, product data and sample.

.5 Other pertinent data.

.7 Submissions shall include:

.1 Date and revision dates.

.2 Project title and number.

.3 Name and address of:

.1 Subcontractor.
.2 Supplier.
.3 Manufacturer.

.4 Contractor's stamp, signed by Contractor's authorized representative certifying approval of submissions, verification of field measurements and compliance with Contract Documents.

.5 Details of appropriate portions of Work as applicable:

.1 Fabrication.
.2 Layout, showing dimensions, including identified field dimensions, and clearances.
.3 Setting or erection details.
.4 Capacities.
.5 Performance characteristics.
.6 Standards.

.7 Single line and schematic diagrams.

.8 Relationship to adjacent work.

.8 After City's Representative's review, distribute copies.

.9 Submit 6 prints of shop drawings for each requirement requested in specification Sections and as City's Representative may reasonably request.

.10 Submit 6 copies of product data sheets or brochures for requirements requested in specification Sections and as requested by City's Representative where shop drawings will not be prepared due to standardized manufacture of product.

.11 Delete information not applicable to project.

.12 Supplement standard information to provide details applicable to project.

.13 If upon review by City's Representative, no errors or omissions are discovered or if only minor corrections are made, copies will be returned and fabrication and installation of Work may proceed. If shop drawings are rejected, noted copy will be returned and resubmission of corrected shop drawings, through same procedure indicated above, must be performed before fabrication and installation of Work may proceed.

1.4 Samples

.1 Submit for review samples as requested in respective specification Sections. Label samples with origin and intended use.

.2 Deliver samples prepaid to City's Representative's business address.

.3 Notify City's Representative in writing, at time of submission of deviations in samples from requirements of Contract Documents.

.4 Where colour, pattern or texture is criterion, submit full range of samples.

.5 Adjustments made on samples by City's Representative are not intended to change Contract Price. If adjustments affect value of the Work, state such in writing to City's Representative prior to proceeding with the Work.

.6 Make changes in samples which City's Representative may require, consistent with Contract Documents.

.7 Reviewed and accepted samples will become standard of workmanship and material against which installed Work will be verified.

PART 2 - PRODUCTS

2.1 Not used.

PART 3 - EXECUTION

3.1 Not used.

END OF SECTION

PART 1 GENERAL

1.1 References

.1 Uniform Traffic Control Devices for Canada, (UTCD), latest edition distributed by Transportation Association of Canada.

1.2 Protection of Public Traffic

.1 Comply with requirements of Acts, Regulations and By-laws in force for regulation of traffic or use of roadways upon or over which it is necessary to carry out Work or haul materials or equipment.

.2 When working on travelled way:

.1 Place equipment in position to present minimum of interference and hazard to travelling public.

.2 Keep equipment units as close together as working conditions permit and preferably on same side of travelled way.

.3 Do not leave equipment on travelled way overnight.

.3 Do not close any lanes of road without approval of the City. Before re-routing traffic erect suitable signs and devices in accordance with instructions contained in Part D of UTCD.

.4 Keep travelled way graded, free of pot holes and of sufficient width for required number of lanes of traffic.

.1 Provide minimum 7 m wide temporary roadway for traffic in two-way sections through Work and on detours.

.2 Provide minimum 5 m wide temporary roadway for traffic in one-way sections through Work and on detours.

.5 As directed by the City, provide gravelled detours or temporary roads to facilitate passage of traffic around restricted construction area:

.6 Provide and maintain road access and egress to property fronting along Work under Contract and in other areas as indicated, unless other means of road access exist that meet approval of the City.

1.3 Informational and Warning Devices

.1 Provide and maintain signs, and other devices required to indicate construction activities or other temporary and unusual conditions resulting from Project Work which requires road user response.

.2 Supply and erect signs, delineators, barricades and miscellaneous warning devices as specified in Part D, Temporary Conditions Signs and Devices, of UTCD manual.

.3 Place signs and other devices in locations recommended in UTCD manual.

.4 Meet with the City prior to commencement of Work to prepare list of signs and other devices required for project. If situation on site changes, revise list to approval of the City.

.5 Continually maintain traffic control devices in use by:

.1 Checking signs daily for legibility, damage, suitability and location. Clean, repair or replace to ensure clarity and reflectance.

.2 Removing or covering signs which do not apply to conditions existing from day to day.

1.4 Control of Public Traffic

.1 Provide competent flag persons, trained in accordance with, and properly equipped as specified in, UTCD manual in following situations:

.1 When public traffic is required to pass working vehicles or equipment which block all or part of travelled roadway.

.2 When it is necessary to institute one-way traffic system through construction area or other blockage where traffic volumes are heavy, approach speeds are high and traffic signal system is not in use.

.3 When workmen or equipment are employed on travelled way over brow of hills, around sharp curves or at other locations where oncoming traffic would not otherwise have adequate warning.

.4 Where temporary protection is required while other traffic control devices are being erected or taken down.

.5 For emergency protection when other traffic control devices are not readily available.

.6 In situations where complete protection for workers, working equipment and public traffic is not provided by other traffic control devices.

1.5 Operational Requirements

.1 Maintain existing conditions for traffic throughout period of Contract.

1.6 Costs

.1 Cost of providing, maintaining and removing barriers, signs, lights and other devices as outlined in this Section as required for the safe and proper movement of vehicular and pedestrian traffic that may be affected by this project.

.2 Cost of normal roadway maintenance on existing roads and streets, which may be affected by the Contractor's operations for the duration of the Contract.

PART 2 PRODUCTS

2.1 Not used.

PART 3 EXECUTION

3.1 Not used.

END OF SECTION

PART 1 GENERAL

1.1 Section Includes

.1 Health and safety considerations required to ensure that the City of Guelph shows due diligence towards health and safety on construction sites, and meets the requirements laid out in PWGSC/RPB Departmental Policy DP 073 - Occupational Health and Safety - Construction.

1.2 References

.1 Canada Labour Code, Part 2, Canada Occupational Safety and Health Regulations.

.2 Health Canada/Workplace Hazardous Materials Information System (WHMIS).

.1 Material Safety Data Sheets (MSDS).

.3 Province of Ontario

.1 Occupational Health and Safety Act and Regulations for Construction Projects, R.S.O. 1990; last amendment 2011.

1.3 Submittals

.1 Make submittals in accordance with Section 01330 - Submittal Procedures.

.2 Submit site-specific Health and Safety Plan: Within 7 days after date of Notice to Proceed and prior to commencement of Work. Health and Safety Plan must include:

.1 Results of site specific safety hazard assessment.

.2 Results of safety and health risk or hazard analysis for site tasks and operation found in work plan.

.3 Submit 4 copies of Contractor's authorized representative's work site health and safety inspection reports to City and/or authority having jurisdiction weekly.

.4 Submit 4 copies of reports or directions issued by Federal, Provincial and Territorial health and safety inspectors.

.5 Submit 4 copies of incident and accident reports.

.6 Submit WHMIS MSDS - Material Safety Data Sheets in accordance with Section 01357 - Hazardous Materials.

.7 City Representative will review Contractor's site-specific Health and Safety Plan and provide comments to Contractor within 7 days after receipt of plan. Revise plan as appropriate and resubmit plan to City Representative within 4 days after receipt of comments from City Representative.

.8 City Representative’s review of Contractor's final Health and Safety plan should not be construed as approval and does not reduce the Contractor's overall responsibility for construction Health and Safety.

.9 Medical Surveillance: where prescribed by legislation, regulation or safety program, submit certification of medical surveillance for site personnel prior to commencement of Work, and submit additional certifications for any new site personnel to City Representative.

.10 On-site Contingency and Emergency Response Plan: address standard operating procedures to be implemented during emergency situations.

1.4 Filing of Notice

.1 File Notice of Project with Provincial authorities prior to beginning of Work.

1.5 Safety Assessment

.1 Perform site specific safety hazard assessment related to project.

1.6 Meetings

.1 Schedule and administer Health and Safety meeting with City Representative prior to commencement of the Work.

1.7 General Requirements

.1 Develop written site-specific Health and Safety Plan based on hazard assessment prior to beginning site Work and continue to implement, maintain, and enforce plan until final demobilization from site. Health and Safety Plan must address project specifications.

.2 City Representative may respond in writing, where deficiencies or concerns are noted and may request re-submission with correction of deficiencies or concerns.

1.8 Responsibility

.1 Be responsible for health and safety of persons on site, safety of property on site and for protection of persons adjacent to site and environment to extent that they may be affected by conduct of Work.

.2 Comply with and enforce compliance by employees with safety requirements of Contract Documents, applicable federal, provincial, territorial and local statutes, regulations, and ordinances, and with site-specific Health and Safety Plan.

1.9 Compliance Requirements

.1 Comply with Ontario Health and Safety Act and Regulations for Construction Projects, R.S.O.

.2 Comply with Occupational Health and Safety Regulations, 1996.

.3 Comply with Occupational Health and Safety Act, General Safety Regulations, O.I.C.

.4 Comply with Canada Labour Code, Canada Occupational Safety and Health Regulations.

1.10 Unforseen Hazards

.1 When unforeseen or peculiar safety-related factor, hazard, or condition occur during performance of Work, follow procedures in place for Employee's Right to Refuse Work in accordance with Acts and Regulations of Province having jurisdiction and advise City's Representative verbally and in writing.

1.11 Health And Safety Co-Ordinator

.1 Employ and assign to Work, competent and authorized representative as Health and Safety Co-ordinator. Health and Safety Co-ordinator must:

.1 Have minimum 2 years' site-related working experience specific to activities associated with this project.

.2 Have working knowledge of occupational safety and health regulations.

.3 Be responsible for completing Contractor's Health and Safety Training Sessions and ensuring that personnel not successfully completing required training are not permitted to enter site to perform Work.

.4 Be responsible for implementing, enforcing daily and monitoring site-specific Contractor's Health and Safety Plan.

.5 Be on site during execution of Work and report directly to and be under direction of site supervisor.

1.12 Posting of Documents

.1 Ensure applicable items, articles, notices and orders are posted in conspicuous location on site in accordance with Acts and Regulations of Province having jurisdiction, and in consultation with City Representative.

1.13 Correction of Non-Compliance

.1 Immediately address health and safety non-compliance issues identified by authority having jurisdiction or by City Representative.

.2 Provide City Representative with written report of action taken to correct non-compliance of health and safety issues identified.

.3 City Representative may stop Work if non-compliance of health and safety regulations is not corrected.

1.14 Blasting

.1 Blasting or other use of explosives is not permitted without prior receipt of written instruction by City's Representative.

1.15 Powder Actuated Devices

.1 Use powder actuated devices only after receipt of written permission from City's Representative.

1.16 Work Stoppage

.1 Give precedence to safety and health of public and site personnel and protection of environment over cost and schedule considerations for the Work.

PART 2 PRODUCTS

2.1 Not used.

PART 3 EXECUTION

3.1 Not used.

END OF SECTION

PART 1 GENERAL

1.1 Related Sections

.1 Section 01330 - Submittal Procedures.

1.2 References

.1 Export and Import of Hazardous Waste Regulations (EIHW Regulations), SOR/92-637.

.2 Current National Fire Code of Canada.

.3 Current Transportation of Dangerous Goods Act (TDG Act), (T-19.01).

.4 Transportation of Dangerous Goods Regulations (TDGR), (SOR/85-77, SOR/85-585, SOR/85-609, SOR/86-526).

1.3 Definitions

.1 Dangerous Goods: Product, substance, or organism that is specifically listed or meets the hazard criteria established in Transportation of Dangerous Goods Regulations.

.2 Hazardous Material: Product, substance, or organism that is used for its original purpose; and that is either dangerous goods or a material that may cause adverse impact to the environment or adversely affect health of persons, animals, or plant life when released into the environment.

.3 Hazardous Waste: Any hazardous material that is no longer used for its original purpose and that is intended for recycling, treatment or disposal.

.4 Workplace Hazardous Materials Information System (WHMIS): A Canada-wide system designed to give employers and workers information about hazardous materials used in the workplace. Under WHMIS, information on hazardous materials is to be provided on container labels, material safety data sheets (MSDS), and worker education programs. WHMIS is put into effect by a combination of federal and provincial laws.

1.4 Submittals

.1 Submit product data in accordance with Section 01330 - Submittal Procedures.

.2 Submit to the City current Material Safety Data Sheet (MSDS) for each hazardous material required prior to bringing hazardous material on site.

.3 Submit hazardous materials management plan to the City that identifies all hazardous materials, their use, their location, personal protective equipment requirements, and disposal arrangements.

1.5 Storage and Handling

.1 Coordinate storage of hazardous materials with the City and abide by internal requirements for labelling and storage of materials and wastes.

.2 Store and handle hazardous materials and wastes in accordance with applicable federal and provincial laws, regulations, codes, and guidelines.

.3 Store and handle flammable and combustible materials in accordance with current National Fire Code of Canada requirements.

.4 Keep no more than 45 litres of flammable and combustible liquids such as gasoline, kerosene and naphtha for ready use. Store all flammable and combustible liquids in approved safety cans bearing the Underwriter's Laboratory of Canada or Factory Mutual seal of approval. Storage of quantities of flammable and combustible liquids exceeding 45 litres for work purposes requires the written approval of the City.

.5 Transfer of flammable and combustible liquids is prohibited within buildings.

.6 Transfer of flammable and combustible liquids will not be carried out in the vicinity of open flames or any type of heat-producing devices.

.7 Flammable liquids having a flash point below 38ºC, such as naphtha or gasoline, will not be used as solvents or cleaning agents.

.8 Store flammable and combustible waste liquids for disposal in approved containers located in a safe, ventilated area. Keep quantities to a minimum.

.9 Observe smoking regulations at all times. Smoking is prohibited in any area where hazardous materials are stored, used, or handled.

.10 Abide by the following storage requirements for quantities of hazardous materials and wastes in excess of 5 kg for solids, and 5 litres for liquids:

.1 Store hazardous materials and wastes in closed and sealed containers which are in good condition.

.2 Label containers of hazardous materials and wastes in accordance with WHMIS.

.3 Store hazardous materials and wastes in containers compatible with that material or waste.

.4 Segregate incompatible materials and wastes.

.5 Ensure that different hazardous materials or hazardous wastes are not mixed.

.6 Store hazardous materials and wastes in a secure storage area with controlled access.

.7 Maintain a clear egress from storage area.

.8 Store hazardous materials and wastes in a manner and location which will prevent them from spilling into the environment.

.9 Have appropriate emergency spill response equipment available near the storage area, including personal protective equipment.

.10 Maintain an inventory of hazardous materials and wastes, including product name, quantity, and date when storage began.

.11 Ensure personnel have been trained in accordance with Workplace Hazardous Materials Information System (WHMIS) requirements.

.12 Report spills or accidents immediately to the City. Submit a written spill report to the City within 24 hours of incident.

1.6 Transportation

.1 Transport hazardous materials and wastes in accordance with federal Transportation of Dangerous Goods Act, Transportation of Dangerous Goods Regulations, and applicable provincial regulations.

PART 2 PRODUCTS

2.1 Materials

.1 Only bring on site the quantity of hazardous materials required to perform work.

.2 Maintain MSDSs in proximity to where the materials are being used. Communicate this location to personnel who may have contact with hazardous materials.

PART 3 EXECUTION

3.1 Disposal

.1 Dispose of hazardous waste materials in accordance with applicable federal and provincial acts, regulations, and guidelines.

.2 Recycle hazardous wastes for which there is an approved, cost effective recycling process available.

.3 Send hazardous wastes only to authorized hazardous waste disposal or treatment facilities.

.4 Burning, diluting, or mixing hazardous wastes for purpose of disposal is prohibited.

.5 Disposal of hazardous materials in waterways, storm or sanitary sewers, or in municipal solid waste landfills is prohibited.

.6 Dispose of hazardous wastes in a timely fashion in accordance with applicable provincial regulations.

END OF SECTION

PART 1 GENERAL

1.1 Related Sections

.1 Section 01330 - Submittal Procedures.

1.2 References

.1 Canadian Environmental Protection Act,1999 (CEPA 1999).

.2 Current National Fire Code of Canada.

.3 Current Transportation of Dangerous Goods Act (TDG Act).

.4 Transportation of Dangerous Goods Regulations (TDG Regulations), SOR/85-77, SOR/85-585, SOR/85-609, SOR/86-526.

.5 Storage of PCB Material Regulations, SOR/92-507.

.6 Current PCB Waste Export Regulations, SOR/97-109.

.7 Ozone-Depleting Substances Regulations, SOR/95-576.

.8 Current Environmental Code of Practice on Halons.

.9 Current Environmental Code of Practice for Elimination of Fluorocarbon Emissions from Refrigeration and Air Conditioning Systems.

1.3 Definitions

.1 Toxic: For the purposes of this specification, a substance is considered toxic if it is listed on the Toxic Substances List found in Schedule 1 of CEPA.

.2 List of Toxic Substances: found in Schedule 1 of CEPA, lists all substances that have been assessed as toxic. The federal government can make regulations with respect to a substance specified on the List of Toxic Substances. Column II of this List identifies the type of regulation applicable to each substance.

.3 PCBs: includes any chlorobiphenyls referred to in Column I of item 1 of the List of Toxic Substances in Schedule I of the Canadian Environmental Protection Act.

1.4 Submittals

.1 Product Data
  .1 Submit photocopy of shipping documents to the City when shipping toxic wastes off site.

.2 Maintain a copy of product data in readily accessible file on site.

.2 Submission Requirements

.1 Submit product data to the City in accordance with Section 01330 - Submittal Procedures.

.2 Express all weights and volumes in SI Metric units.

.3 Accompany submissions with transmittal letter containing:

.1 Date.
.2 Project title and number.
.3 Contractor's name and address.
.4 Identification and quantity of attached product data.
.5 Other pertinent data.

1.5 Storage and Handling

.1 Store and handle toxic wastes in accordance with applicable federal and provincial laws, regulations, codes, and guidelines.

.2 Store and handle flammable and combustible wastes in accordance with current National Fire Code of Canada requirements.

.3 Co-ordinate storage of toxic wastes with the City and abide by internal requirements for labelling and storage of wastes.

.4 Observe smoking regulations at all times. Smoking is prohibited in any area where toxic wastes are stored, used, or handled.

.5 Only certified persons who have successfully completed the Environment Canada Environmental Awareness Course for the Environmentally Safe Handling of Refrigerants are permitted to work on refrigeration and air conditioning systems.

.6 Report spills or accidents involving toxic wastes immediately to the City and to appropriate regulatory authorities. Take all reasonable measures to contain the release while ensuring health and safety is protected.

.7 Transport toxic wastes in accordance with federal Transportation of Dangerous Goods Act, Transportation of Dangerous Goods Regulations, and applicable provincial regulations.

.8 Use only an authorized/licensed carrier to transport toxic waste.

.9 Co-ordinate transportation and disposal of toxic wastes with the City

1.6 Waste Management and Disposal

.1 Dispose of toxic wastes generated on site in accordance with applicable federal and provincial acts, regulations, and guidelines.

.2 Ensure toxic waste is shipped to an authorized/licensed treatment or disposal facility and that all liability insurance requirements are met.

.3 Provide the City with certification of approved MOE part V Landfill location.

PART 1 – PRODUCTS

2.1 Not used.

PART 2 – EXECUTION

3.1 Not used.

END OF SECTION

PART 1 GENERAL

1.1 Inspection

.1 Allow the City access to the Work. If part of The Work is in preparation at locations other than Place of the Work, allow access to the Work whenever it is in progress.

.2 Provide timely request for inspection if the Work that is designated for testing, inspecting or verification as specified or required by current regulations.

.3 If Contractor covers or permits to be covered the Work that has been designated for special tests, inspections or approvals before such is made, uncover such Work, have inspections or tests satisfactorily completed and make good such Work.

.4 The City may order any part of the Work to be examined if the Work is suspected to be not in accordance with Contract Documents. If, upon examination such Work is found not in accordance with Contract Documents, Contractor to correct such Work and pay entire cost of examination and correction.

1.2 Independent Inspection Agencies

.1 Independent inspection/testing Agency will be engaged by the City for purpose of inspecting and/or testing portions of the Work.

.2 City is to retain and pay all associated costs of employing testing agency.

.3 Contractor to contact the following agency directly for purpose of inspection and/or testing requirements:

EXP SERVICES INC.
405 Maple Grove Road, Unit 6
Cambridge ON N3E 1B6
T 519-650-4918 x 230
F 519-650-4603
Contact: Mr. Geordy Fournier

.4 Provide equipment required for executing inspection and testing by appointed agencies.

.5 Employment of inspection/testing agencies does not relax responsibility to perform the Work in accordance with Contract Documents.

.6 If defects are revealed during inspection and/or testing, appointed agency will request additional inspection and/or testing to ascertain full degree of defect. Correct defect and irregularities as advised at no cost to the City.

.7 Contractor to pay costs for all retesting and re-inspection associated with failed tests.

1.3 Access to The Work

.1 Allow inspection/testing agency access to the Work, off site manufacturing and fabrication plants.

.2 Co-operate with inspection/testing agency to provide reasonable facilities for such access.

1.4 Procedures

.1 Notify appropriate agency and the City in advance of requirement for tests, in order that attendance arrangements can be made.

.2 Submit samples and/or materials required for testing, as specifically requested in first meeting agenda. Submit with reasonable promptness and in an orderly sequence so as not to cause delay in the Work.

.3 Provide labour and facilities to obtain and handle samples and materials on site. Provide sufficient space to store and cure test samples.

1.5 Rejected The Work

.1 Remove defective Work, whether result of poor the Workmanship, use of defective products or damage and whether incorporated in the Work or not, which has been rejected by the City as failing to conform to Contract Documents. Replace or re-execute in accordance with Contract Documents at no additional cost to the City.

.2 Make good other Contractor's Work damaged by such removals or replacements promptly and at no additional cost to the City.

1.6 Reports

.1 Reports by Testing Agency will be directly distributed to the City Project Manager and City’s representative as soon as available so as not to impede the Work schedule.

.2 Reports of all other inspection and test results will be distributed by the Contractor to the City Project Manager and City’s representative as soon as available. Provide 2 copies for each party.

1.7 Tests and Mix Designs

.1 Furnish test results and mix designs as may be requested.

1.8 Mock-ups

.1 Prepare mock-ups for the Work specifically requested in specifications. Include for the Work of all Sections required to provide mock-ups.

.2 Remove mock-up at conclusion of the Work. Mock-ups may remain as part of the Work, when acceptable to the City.

PART 2 PRODUCTS

2.1 Not used.

PART 3 EXECUTION

3.1 Not used.

END OF SECTION

PART 1 GENERAL

1.1 Related Sections

.1 Section 01520 - Construction Facilities.

.2 Section 01560 - Temporary Barriers and Enclosures.

1.2 Installation and Removal

.1 Provide temporary utilities and controls in order to execute work expeditiously.

.2 Remove from site all such work after use.

1.3 Dewatering

.1 Provide temporary drainage and pumping facilities to keep excavations and site free from standing water.

1.4 Water Supply

.1 Provide continuous supply of potable water for construction use.

.2 Arrange for connection with appropriate utility company and pay all costs for installation, maintenance and removal.

.3 Pay for utility charges at prevailing rates.

1.5 Temporary Heating and Ventilation

.1 Provide temporary heating required during construction period, including attendance, maintenance and fuel.

.2 Construction heaters used inside building must be vented to outside or be non-flameless type. Solid fuel salamanders are not permitted.

.3 Provide temporary heat and ventilation in enclosed areas as required to:

.1 Facilitate progress of Work.
.2 Protect Work and products against dampness and cold.
.3 Prevent moisture condensation on surfaces.
.4 Provide ambient temperatures and humidity levels for storage, installation and curing of materials.
.5 Provide adequate ventilation to meet health regulations for safe working environment.

.4 Maintain temperatures of minimum 10 degrees C in areas where construction is in progress.

.5 Ventilating:

.1 Prevent accumulations of dust, fumes, mists, vapours or gases in areas occupied during construction.
.2 Provide local exhaust ventilation to prevent harmful accumulation of hazardous substances into atmosphere of occupied areas.
.3 Dispose of exhaust materials in manner that will not result in harmful exposure to persons.
.4 Ventilate storage spaces containing hazardous or volatile materials.
.5 Ventilate temporary sanitary facilities.
.6 Continue operation of ventilation and exhaust system for time after cessation of work process to assure removal of harmful contaminants.

.6 On completion of Work for which permanent heating system is used clean and restore as directed by the City.

.7 Ensure Date of Substantial Performance and Warranties for heating system do not commence until entire system is in as near original condition as possible and is certified by the City.

.8 Pay costs for maintaining temporary heat, when using permanent heating system.

.9 Maintain strict supervision of operation of temporary heating and ventilating equipment to:
.1 Conform with applicable codes and standards.
.2 Enforce safe practices.
.3 Prevent abuse of services.
.4 Prevent damage to finishes.
.5 Vent direct-fired combustion units to outside.

.10 Be responsible for damage to Work due to failure in providing adequate heat and protection during construction.

1.6 Temporary Power and Light

.1 Provide and pay for temporary power during construction for temporary lighting and operating of power tools.

.2 Arrange for connection with appropriate utility company. Pay all costs for installation, maintenance and removal.

.3 Provide and maintain temporary lighting throughout project.

1.7 Temporary Communication Facilities

.1 Provide and pay for temporary communication lines as necessary for own use and use by the City.

1.8 Fire Protection

.1 Provide and maintain temporary fire protection equipment during performance of Work required by insurance companies having jurisdiction and governing codes, regulations and bylaws.

.2 Burning rubbish and construction waste materials is not permitted on site.

PART 1 – PRODUCTS

2.1 Not used.

PART 2 – EXECUTION

3.1 Not used.

END OF SECTION

PART 1 GENERAL

1.1 Related Sections

.1 Section 01510 - Temporary Utilities.

.2 Section 01560 - Temporary Barriers and Enclosures.

1.2 References

.1 Canadian General Standards Board (CGSB)

.1 CGSB 1-GP-189M-[84], Primer, Alkyd, Wood, Exterior.

.2 CGSB 1.59-[97], Alkyd Exterior Gloss Enamel.

.2 Canadian Standards Association (CSA International)

.1 CAN3-A23.1-/A23.2-[94], Concrete Materials and Methods for Concrete Construction/Method of Test for Concrete.

.2 CSA-0121-[M1978], Douglas Fir Plywood.

.3 CAN/CSA-Z321-[96], Signs and Symbols for the Occupational Environment.

1.3 Installation and Removal

.1 Provide construction facilities in order to execute work expeditiously.

.2 Prepare site plan indicating proposed location and dimensions of Contractor staging area to be fenced and used by Contractor, number of trailers to be used, avenues of ingress/egress to fenced area and details of fence installation.

.3 Identify areas which have to be gravelled to prevent tracking of mud.

.4 Indicate supplemental or other staging areas.

.5 Remove from site all such work after use.

1.4 Scaffolding

.1 Scaffolding in accordance with CAN/CSA-S269.2.

.2 Provide and maintain scaffolding, ramps, ladders, swing staging, platforms, and temporary stairs.

1.5 Hoisting

.1 Provide, operate and maintain hoists and cranes required for moving of workers, materials and equipment. Make financial arrangements with Subcontractors for use thereof.

.2 Hoists and cranes shall be operated by qualified operator.

1.6 Site Storage / Loading

.1 Confine work and operations of employees by Contract Documents. Do not unreasonably encumber premises with products.

.2 Do not load or permit to load any part of Work with a weight or force that will endanger the Work.

1.7 Construction Parking

.1 Parking will be permitted on site only within Contractor staging area and provided it does not disrupt performance of Work.

.2 Provide and maintain adequate access to project site.

.3 Clean roadway and sidewalk areas where used by Contractor's equipment.

1.8 Security

.1 Provide and pay for responsible security personnel to guard site and contents of site after working hours and during holidays.

1.9 Offices

.1 Site office is at the sole discretion of the Contractor.

.2 Provide office heated to 22 ^{o}C, lighted 750 lx and ventilated, of sufficient size to accommodate site meetings and furnished with drawing laydown table.

.3 Provide a clearly marked and fully stocked first-aid case in a readily available location.

1.10 Equipment, Tool and Materials Storage

.1 Provide and maintain, in a clean and orderly condition, lockable weatherproof sheds for storage of tools, equipment and materials.

.2 Locate materials not required to be stored in weatherproof sheds on site in a manner to cause least interference with work activities.

1.11 Sanitary Facilities

.1 Provide sanitary facilities for work force in accordance with governing regulations and ordinances.

.2 Post notices and take such precautions as required by local health authorities. Keep area and premises in sanitary condition.

.3 At the discretion of the Contractor, provide temporary water closets and urinals complete with temporary enclosures

1.12 Construction Signage

.1 Provide and erect, within 3 weeks of signing Contract, a project sign in a location designated by City's Representative.

.2 Construction sign 2 x 1.2 m, of pressure-treated wood frame and plywood construction painted with exhibit lettering produced by a professional sign painter.

.3 Indicate on sign, name of Owner, City's Representative and Contractor of a design style established by City's Representative.

.4 No other signs or advertisements, other than warning signs, are permitted on site.

.5 Provide project identification site sign comprising foundation, framing, and one 1200 x 2400 mm signboard as detailed and as described below.

.1 Foundations: 15 MPa concrete to CAN/CSA-A23.1 minimum 200 mm x 900 mm deep.

.2 Framework and battens: SPF, pressure treated minimum 89 x 89 mm.

.3 Signboard: 19 mm Medium Density Overlaid Douglas Fir Plywood to CSA O121.

.4 Paint: alkyd enamel to CAN/CGSB-1.59 over exterior alkyd primer to CGSB 1-GP-189.

.5 Fasteners: hot-dip galvanized steel nails and carriage bolts.

.6 Vinyl sign face: printed project identification, self adhesive, vinyl film overlay, supplied by City's Representative.

.6 Locate project identification sign as directed by City's Representative and construct as follows:

.1 Build concrete foundation, erect framework, and attach signboard to framing.

.2 Paint all surfaces of signboard and framing with one coat primer and two coats enamel. Colour white on signboard face, black on other surfaces.

.3 Apply vinyl sign face overlay to painted signboard face in accordance with installation instruction supplied.

.7 Direct requests for approval to erect a City's Representative/Contractor signboard to City's Representative. For consideration general appearance of City's Representative/Contractor signboard must conform to project identification site sign. Wording shall be in English.

.8 Signs and notices for safety and instruction shall be in English. Graphic symbols shall conform to CAN3-Z321.

.9 Maintain approved signs and notices in good condition for duration of project, and dispose of off site on completion of project or earlier if directed by City's Representative.

1.13 Clean Up

.1 Remove construction debris, waste materials, packaging material from work site daily.

.2 Clean dirt or mud tracked onto paved or surfaced roadways and sidewalks.

PART 2 PRODUCTS

2.1 Not used.

PART 3 EXECUTION

3.1 Not used.

END OF SECTION

PART 1 GENERAL

1.1 Related Sections

.1 Section 01352 - Special Procedures Traffic Control.

.2 Section 01510 - Temporary Utilities.

.3 Section 01520 - Construction Facilities.

1.2 References

.1 Canadian General Standards Board (CGSB)

.1 Current CGSB 1.189M, Primer, Alkyd, Wood, Exterior.
.2 Current CGSB 1.59, Alkyd Exterior Gloss Enamel.

.2 Canadian Standards Association (CSA)

.1 Current CSA-O121-M, Douglas Fir Plywood.

1.3 Installation and Removal

.1 Provide temporary controls in order to execute Work expeditiously.

.2 Remove from site all such work after use.

1.4 Temporary Barrier Fence

.1 Provide barriers around trees and plants designated to remain. Protect from damage by equipment and construction procedures per detail.

.2 Provide temporary site enclosures as required to protect the Work. These will be erected at the discretion of the Contractor. Use new 1.2m high with plastic snow fence wired to rolled steel "T" bar fence posts spaced at 1.8m on centre. Maintain fence in good repair.

1.5 Guard Rails and Barricades

.1 Provide secure, rigid guard rails and barricades around deep excavations.

1.6 Sediment Control Fencing

.1 Supply, install and secure prefabricated sediment control fencing to prevent sediment migration off site as indicated on drawings. See detail:

1.7 Access to Site

.1 Provide and maintain access roads, sidewalk crossings, ramps and construction runways as may be required for access to the Work.

1.8 Public Traffic Flow

.1 Provide and maintain competent signal flag operators, traffic signals, barricades and flares, lights, or lanterns as required to perform Work and protect the public.

1.9 Fire Routes

.1 Maintain access to property including overhead clearances for use by emergency response vehicles.

1.10 Protection for Off-Site and Public Property

.1 Protect surrounding private and public property from damage during performance of the Work.

.1 Be responsible for damage incurred.

1.11 Protection of Adjacent Buildings

.1 Provide protection for finished and partially finished adjacent buildings and equipment during performance of the Work.

.2 Provide necessary screens, covers, and hoardings.

.3 Be responsible for damage incurred due to lack of or improper protection.

PART 2 PRODUCTS

2.1 Not used.

PART 3 EXECUTION

3.1 Not used.

END OF SECTION

PART 1 GENERAL

1.1 Section Includes

.1 Product quality, availability, storage, handling, protection, and transportation.

.2 Manufacturer's instructions.

.3 Quality of Work, coordination and fastenings.

.4 Existing facilities.

1.2 Related Sections

.1 Section 01730 – Execution Requirements.

1.3 Reference Standards

.1 Conform to these reference standards, in whole or in part as specifically requested in specifications.

.2 If there is question as to whether any product or system is in conformance with applicable standards, the City's Representative reserves right to have such products or systems tested to prove or disprove conformance.

.3 Cost for such testing will be born by Owner in event of conformance with Contract Documents or by Contractor in event of non-conformance.

.4 Conform to latest date of issue of referenced standards in effect on date of submission of Tenders, except where specific date or issue is specifically noted.

1.4 Quality

.1 Products, materials, equipment and articles (referred to as products throughout specifications) incorporated in the Work shall be new, not damaged or defective, and of best quality (compatible with specifications) for purpose intended. If requested, furnish evidence as to type, source and quality of products provided.

.2 Defective products, whenever identified prior to completion of the Work, will be rejected, regardless of previous inspections. Inspection does not relieve responsibility, but is precaution against oversight or error. Remove and replace defective products at own expense and be responsible for delays and expenses caused by rejection.

.3 Should any dispute arise as to quality or fitness of products, decision rests strictly with City's Representative based upon requirements of Contract Documents.

.4 Unless otherwise indicated in specifications, maintain uniformity of manufacture for any particular or like item throughout the project.

.5 Permanent labels, trademarks and nameplates on products are not acceptable in prominent locations, except where required for operating instructions.

1.5 Availability

.1 Immediately upon signing Contract, review product delivery requirements and anticipate foreseeable supply delays for any items. If delays in supply of products are foreseeable, notify City's Representative of such, in order that substitutions or other remedial action may be authorized in ample time to prevent delay in performance of the Work.

.2 In the event of failure to notify City's Representative at commencement of the Work and should it subsequently appear that the Work may be delayed for such reason, City's Representative reserves right to substitute more readily available products of similar character, at no increase in Contract Price or Contract Time.

1.6 Storage, Handling and Protection

.1 Handle and store products in manner to prevent damage, adulteration, deterioration and soiling and in accordance with manufacturer's instructions when applicable.

.2 Store packaged or bundled products in original and undamaged condition with manufacturer's seal and labels intact. Do not remove from packaging or bundling until required in Work.

.3 Store products subject to damage from weather in weatherproof enclosures.

.4 Store cementitious products clear of earth or concrete floors, and away from walls.

.5 Keep sand, when used for grout or mortar materials, clean and dry. Store sand on wooden platforms and cover with waterproof tarpaulins during inclement weather.

.6 Store sheet materials lumber and site furnishings on flat, solid supports and keep clear of ground. Slope to shed moisture.

.7 Store and mix paints in heated and ventilated room. Remove oily rags and other combustible debris from site daily. Take every precaution necessary to prevent spontaneous combustion.

.8 Remove and replace damaged products at own expense and to satisfaction of City's Representative.

.9 Touch-up damaged factory finished surfaces to City's Representative's satisfaction. Use touch-up materials to match original. Do not paint over name plates.

1.7 Transportation

.1 Pay costs of transportation of products required in performance of Work.

.2 Transportation cost of products supplied by the City will be paid for by the City. Unload, handle and store such products.

1.8 Manufacturer's Instructions

.1 Unless otherwise indicated in specifications, install or erect products in accordance with manufacturer's instructions. Do not rely on labels or enclosures provided with products. Obtain written instructions directly from manufacturers.

.2 Notify City's Representative in writing, of conflicts between specifications and manufacturer's instructions, so that City's Representative may establish course of action.

.3 Improper installation or erection of products, due to failure in complying with these requirements, authorizes the City's Representative to require removal and re-installation at no increase in Contract Price or Contract Time.

1.9 Quality of Work

.1 Ensure Quality of Work is of highest standard, executed by workers experienced and skilled in respective duties for which they are employed. Immediately notify City's Representative if required Work is such as to make it impractical to produce required results.

.2 Do not employ anyone unskilled in their required duties. City's Representative reserves right to require dismissal from site, workers deemed incompetent or careless.

.3 Decisions as to standard or fitness of Quality of Work in cases of dispute rest solely with City's Representative, whose decision is final.

1.10 Co-Ordination

.1 Ensure cooperation of workers in laying out Work. Maintain efficient and continuous supervision.

.2 Be responsible for coordination and placement of openings, sleeves and accessories.

1.11 Concealment

.1 Before installation, inform City's Representative if there is interference. Install as directed by City's Representative.

1.12 Remedial Work

.1 Perform remedial work required to repair or replace parts or portions of the Work identified as defective or unacceptable. Coordinate adjacent affected Work as required.

.2 Perform remedial work by specialists familiar with materials affected. Perform in a manner to neither damage nor put at risk any portion of Work.

1.13 Location of Fixtures

.1 Locate site furnishings, fixtures, signs, and culverts as indicated on drawings.

.2 Inform City's Representative of conflicting installation. Install as directed.

1.14 Fastenings

.1 Provide metal fastenings and accessories in same texture, colour and finish as adjacent materials, unless indicated otherwise.

.2 Prevent electrolytic action between dissimilar metals and materials.

.3 Use non-corrosive hot dip galvanized steel fasteners and anchors for securing exterior work, unless stainless steel or other material is specifically requested in affected specification Section.

.4 Space anchors within individual load limit or shear capacity and ensure they provide positive permanent anchorage. Wood, or any other organic material plugs are not acceptable.

.5 Keep exposed fastenings to a minimum, space evenly and install neatly.

.6 Fastenings which cause spalling or cracking of material to which anchorage is made are not acceptable.

1.15 Existing Utilities

.1 When breaking into or connecting to existing services or utilities, execute the Work at times directed by local governing authorities, with minimum of disturbance to Work, and pedestrian and vehicular traffic.

.2 Protect, relocate or maintain existing active services. When services are encountered, cap off in manner approved by authority having jurisdiction. Stake and record location of capped service.

PART 2 PRODUCTS

2.1 Not used.

PART 3 EXECUTION

3.1 Not used.

END OF SECTION

PART 1 GENERAL

1.1 Related Sections

.1 Section 01320 - Construction Progress Documentation.

1.2 References

.1 City's identification of existing survey control points and property limits.

1.3 Qualifications of Surveyor

.1 Qualified registered land surveyor, licensed to practise in Place of Work, acceptable to the City.

1.4 Survey Reference Points

.1 Existing base horizontal and vertical control points are designated on drawings.

.2 Locate, confirm and protect control points prior to starting site work. Preserve permanent reference points during construction.

.3 Make no changes or relocations without prior written notice to the City.

.4 Report to the City when reference point is lost or destroyed, or requires relocation because of necessary changes in grades or locations.

.5 Require surveyor to replace control points in accordance with original survey control.

1.5 Survey Requirements

.1 Establish a minimum of two permanent bench marks on site, referenced to established bench marks by survey control points. Record locations, with horizontal and vertical data in Project Record Documents.

.2 Establish lines and levels, locate and lay out, by instrumentation.

.3 Stake for trail layout and alignment.

.4 Stake for grading, fill and topsoil placement, and landscape features.

.5 Stake slopes and berms.

.6 Establish pipe invert elevations.

.7 Stake batter boards for foundations.

.8 Establish lines and levels for mechanical and electrical work.

1.6 Existing Services

.1 Before commencing work, establish location and extent of service lines in area of Work and notify the City of findings.

.2 Remove abandoned service lines within 2 m of new structures. Cap or otherwise seal lines at cut-off points as directed by the City.

1.7 Location of Equipment and Fixtures

.1 Location of equipment, fixtures and outlets indicated or specified are to be considered as approximate.

.2 Locate equipment, fixtures and distribution systems to provide minimum interference and maximum usable space and in accordance with manufacturer's recommendations for safety, access and maintenance.

.3 Inform the City of impending installation and obtain approval for actual location.

.4 Submit field drawings to indicate relative position of various services and equipment when required by the City.

1.8 Records

.1 Maintain a complete, accurate log of control and survey work as it progresses.

.2 On completion of foundations and major site improvements, prepare a certified survey showing dimensions, locations, angles and elevations of Work.

.3 Record locations of maintained, re-routed and abandoned service lines.

.4 Submit certificate signed by surveyor certifying and noting those elevations and locations of completed Work that conform and do not conform with Contract Documents.

1.9 Subsurface Conditions

.1 Promptly notify the City in writing if subsurface conditions at Place of Work differ materially from those indicated in Contract Documents, or a reasonable assumption of probable conditions based thereon.

.2 After prompt investigation, should the City determine that conditions do differ materially, instructions will be issued for changes in Work.

PART 2 PRODUCTS

2.1 Not used.

PART 3 EXECUTION

3.1 Not used.

END OF SECTION

PART 1 GENERAL

1.1 SECTION INCLUDES

.1 Requirements and limitations for cutting and patching the Work.

1.2 RELATED SECTIONS

.1 Section 01110 - Summary of Work.

.2 Section 01330 - Submittal Procedures.

.3 Individual product Sections: cutting and patching incidental to work of section. Advance notification to other sections required.

1.3 SUBMITTALS

.1 Submit written request in advance of cutting or alteration which affects:

- .1 Structural integrity of any element of Project.
- .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.

.2 Include in request:

- .1 Identification of Project.
- .2 Location and description of affected Work.
- .3 Statement on necessity for cutting or alteration.
- .4 Description of proposed Work, and products to be used.
- .5 Alternatives to cutting and patching.
- .6 Effect on Work of Owner or separate contractor.
- .7 Written permission of affected separate contractor.
- .8 Date and time work will be executed.

1.4 MATERIALS

.1 Required for original installation.

.2 Change in Materials: Submit request for substitution in accordance with Section 01330 - Submittal Procedures.

1.5 PREPARATION

.1 Inspect existing conditions, including elements subject to damage or movement during cutting and patching.

.2 After uncovering, inspect conditions affecting performance of Work.

.3 Beginning of cutting or patching means acceptance of existing conditions.

.4 Provide supports to assure structural integrity of surroundings; provide devices and methods to protect other portions of project from damage.

.5 Provide protection from elements for areas which may be exposed by uncovering work; maintain excavations free of water.

1.6 EXECUTION

.1 Execute cutting, fitting, and patching including excavation and fill, to complete the Work.

.2 Fit several parts together, to integrate with other Work.

.3 Uncover the Work to install ill-timed Work.

.4 Remove and replace defective and non-conforming Work.

.5 Remove samples of installed Work for testing.]

.6 Provide openings in non-structural elements of the Work for penetrations of mechanical and electrical Work.

.7 Execute Work by methods to avoid damage to other Work, and which will provide proper surfaces to receive patching and finishing.

.8 Employ original installer to perform cutting and patching for weather-exposed and moisture-resistant elements, and sight-exposed surfaces.

.9 Cut rigid materials using masonry saw or core drill. Pneumatic or impact tools not allowed on masonry work without prior approval.

.10 Restore work with new products in accordance with requirements of the Contract Documents.

.11 Fit Work to pipes, sleeves, ducts, conduit, and other penetrations through surfaces.

.12 At Refinish surfaces to match adjacent finishes: For continuous surfaces refinish to nearest intersection; for an assembly, refinish entire unit.

.13 Conceal pipes, ducts and wiring in floor, wall and ceiling construction of finished areas except where indicated otherwise.

PART 2 PRODUCTS

2.1 Not used.

PART 3 EXECUTION

3.1 Not used.

END OF SECTION

PART 1 - GENERAL

1.1 Related Sections

.1 Section 01010 – Special Provisions

1.2 Dust and Cleaning Requirements

.1 Standards: Maintain project in accordance with the latest edition of The Occupational Health and Safety Act.

.2 Hazards and Dust Control

.1 Store volatile wastes in covered metal containers, and remove from premises daily.

.2 Prevent accumulation of wastes which create hazardous conditions.

.3 Provide adequate ventilation during use of volatile or noxious substances.

.4 Prevent spread of dust beyond the construction site by wetting, or by other means suitable for conditions, as it accumulates.

.3 Conduct cleaning and disposal operations to comply with local ordinances and anti-pollution laws:

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

.2 Do not dispose of volatile wastes such as mineral spirits, oil, or paint thinner in storm or sanitary drains.

.3 Do not dispose of wastes into streams, waterways, open drain courses or on the ground.

PART 2 - PRODUCTS

2.1 Materials

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

.2 Use cleaning materials only on surfaces recommended by cleaning material manufacturer.

.3 Advise City's Representative of any surface or part of the Work requiring cleaning.

PART 3 - EXECUTION

3.1 During Construction

.1 Execute cleaning to ensure that the work area is maintained free from accumulations of waste materials and rubbish as a result of construction activities. Keep site clear of snow, mud and pooling of water due to severe rain. Ensure that work is not stopped because of failure to provide access to site.

.2 Wet down materials and rubbish to prevent blowing dust.

.3 At reasonable intervals during progress of work, clean site and public properties. Dispose of waste materials, debris and rubbish daily.

.4 Unless otherwise specified, salvaged material resulting from construction, and surplus materials and construction debris shall become property of Contractor, who shall dispose of it off site.

.5 Provide on-site containers for collection of waste materials, debris and rubbish.

.6 Remove waste materials, debris and rubbish from site and legally dispose of at public or private dumping areas off Owner's property.

.7 Obtain from each Subcontractor, instructions which designate proper methods and materials to be use in final cleaning, and submit such instructions to the City's Representative.

.8 Handle materials in a controlled manner with as few handlings as possible; do not drop or throw materials from heights.

.9 Schedule cleaning operations so that dust and other contaminants resulting from cleaning process will not fall on ground or in water courses, open water or wetlands.

3.2 Final Cleaning

.1 At completion of Work, remove waste materials, rubbish, tools, equipment, machinery, and surplus materials, and leave site in the same condition prior to construction.

3.3 Removal of Temporary Facilities

.1 Completely remove temporary facilities from site, making good any damage when no longer required.

END OF SECTION

PART 1 GENERAL

1.1 Section Includes

.1 Administrative procedures preceding preliminary and final inspections of Work.

1.2 Related Sections

.1 Section 01780 - Closeout Submittals.

1.3 Inspection and Declaration

.1 Contractor's Inspection: Contractor and all Subcontractors shall conduct an inspection of Work, identify deficiencies and defects, and repair as required to conform to Contract Documents.

.1 Notify City's Representative in writing of satisfactory completion of Contractor's Inspection and that corrections have been made.

.2 Request City's Representative's Inspection.

.2 City's Representative's Inspection: City's Representative and Contractor will perform inspection of Work to identify obvious defects or deficiencies. Contractor shall correct Work accordingly.

.3 Completion: submit written certificate that following have been performed:

.1 Work has been completed and inspected for compliance with Contract Documents.

.2 Defects have been corrected and deficiencies have been completed.

.3 Equipment and systems have been tested, [adjusted] [and] [balanced] and are fully operational.

.4 Certificates required by Utility companies have been submitted.

.5 Operation of systems have been demonstrated to Owner's personnel.

.6 Work is complete and ready for Final Inspection.

.4 Final Inspection: when items noted above are completed, request final inspection of Work by Owner, City's Representative] and Contractor. If Work is deemed incomplete by Owner City's Representative, complete outstanding items and request re-inspection.

.5 Declaration of Substantial Performance: when Owner and City's Representative consider deficiencies and defects have been corrected and it appears requirements of Contract have been substantially performed, make application for certificate of Substantial Performance.

.6 Commencement of Lien and Warranty Periods: date of Owner's acceptance of submitted declaration of Substantial Performance shall be date for commencement for warranty period and commencement of lien period unless required otherwise by lien statute of Place of Work.

.7 Final Payment: When Owner and City's Representative consider final deficiencies and defects have been corrected and it appears requirements of Contract have been totally

performed, make application for final payment. If Work is deemed incomplete by Owner and City's Representative, complete outstanding items and request re-inspection.

.8 Payment of Holdback: After issuance of certificate of Substantial Performance of Work, submit an application for payment of holdback amount.

PART 2 PRODUCTS

2.1 Not used.

PART 3 EXECUTION

3.1 Not used.

END OF SECTION

PART 1 GENERAL

1.1 SECTION INCLUDES

.1 As-built, samples, and specifications.

.2 Equipment and systems.

.3 Product data, materials and finishes, and related information.

.4 Operation and maintenance data.

.5 Spare parts, special tools and maintenance materials.

.6 Warranties and bonds.

.7 Final site survey.

1.2 Related Sections

.1 Section 01330 – Submittal Procedures.

.2 Section 01450 - Quality Control.

.3 Section 01770 - Closeout Procedures.

1.3 Submission

.1 Prepare instructions and data using personnel experienced in maintenance and operation of described products.

.2 Copy will be returned after final inspection, with City's Representative's comments.

.3 Revise content of documents as required prior to final submittal.

.4 Two weeks prior to Substantial Performance of the Work, submit to the City's Representative, 4 final copies of operating and maintenance manuals in English.

.5 Ensure spare parts, maintenance materials and special tools provided are new, undamaged or defective, and of same quality and manufacture as products provided in Work.

.6 If requested, furnish evidence as to type, source and quality of products provided.

.7 Defective products will be rejected, regardless of previous inspections. Replace products at own expense.

.8 Pay costs of transportation.

1.4 Format

.1 Organize data in the form of an instructional manual.

.2 Binders: vinyl, hard covered, 3 'D' ring, loose leaf 219 x 279 mm with spine and face pockets.

.3 When multiple binders are used, correlate data into related consistent groupings. Identify contents of each binder on spine.

.4 Cover: Identify each binder with type or printed title 'Project Record Documents'; list title of project and identify subject matter of contents.

.5 Arrange content by systems, process flow, under Section numbers and sequence of Table of Contents.

.6 Provide tabbed fly leaf for each separate product and system, with typed description of product and major component parts of equipment.

.7 Text: Manufacturer's printed data, or typewritten data.

.8 Drawings: provide with reinforced punched binder tab. Bind in with text; fold larger drawings to size of text pages.

.9 Provide 1:1 scaled CAD files in dxf and dwg format on CD.

1.5 Contents - Each Volume

.1 Table of Contents:

.1 provide title of project, date of submission, names, addresses, and telephone numbers of City's Representative and Contractor with name of responsible parties;

.2 schedule of products and systems, indexed to content of volume.

.2 For each product or system:

.1 list names, addresses and telephone numbers of subcontractors and suppliers, including local source of supplies and replacement parts.

.3 Product Data: mark each sheet to clearly identify specific products and component parts, and data applicable to installation; delete inapplicable information.

.4 Drawings: supplement product data to illustrate relations of component parts of equipment and systems, to show control and flow diagrams.

.5 Typewritten Text: as required to supplement product data. Provide logical sequence of instructions for each procedure, incorporating manufacturer's instructions specified in Section 01450 - Quality Control.

1.6 As-Builts and Samples

.1 Maintain at the site for City's Representative and Owner one record copy of:

.1 Contract Drawings.

.2 Specifications.
.3 Addenda.
.4 Change Orders and other modifications to the Contract.
.5 Reviewed shop drawings, product data, and samples.
.6 Field test records.
.7 Inspection certificates.
.8 Manufacturer's certificates.

.2 Store record documents and samples apart from documents used for construction.

.3 Label record documents and file in accordance with Section number listings in List of Contents of this Project Manual. Label each document "PROJECT RECORD" in neat, large, printed letters.

.4 Maintain record documents in clean, dry and legible condition. Do not use record documents for construction purposes.

.5 Keep record documents and samples available for inspection by City's Representative.

1.7 Recording Actual Site Conditions

.1 Record information on set of black line opaque drawings, and in copy of Project Manual, provided by City's Representative.

.2 Provide felt tip marking pens, maintaining separate colours for each major system, for recording information.

.3 Record information concurrently with construction progress. Do not conceal Work until required information is recorded.

.4 Contract Drawings and shop drawings: legibly mark each item to record actual construction, including:

.1 Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements.
.2 Measured locations of internal utilities and appurtenances, referenced to visible and accessible features of construction.
.3 Field changes of dimension and detail.
.4 Changes made by change orders.
.5 Details not on original Contract Drawings.
.6 References to related shop drawings and modifications.

.5 Specifications: legibly mark each item to record actual construction, including:

.1 Manufacturer, trade name, and catalogue number of each product actually installed, particularly optional items and substitute items.
.2 Changes made by Addenda and change orders.

.6 Other Documents: maintain manufacturer's certifications, inspection certifications, field test records, required by individual specifications sections.

1.8 Final Survey

.1 Submit final site survey certificate, certifying that elevations and locations of completed Work are in conformance, or non-conformance with Contract Documents.

1.9 Materials and Finishes

.1 Building Products, Applied Materials, and Finishes: include product data, with catalogue number, size, composition, and colour and texture designations. Provide information for re-ordering custom manufactured products.

.2 Instructions for cleaning agents and methods, precautions against detrimental agents and methods, and recommended schedule for cleaning and maintenance.

.3 Moisture-protection and Weather-exposed Products: include manufacturer's recommendations for cleaning agents and methods, precautions against detrimental agents and methods, and recommended schedule for cleaning and maintenance.

.4 Additional Requirements: as specified in individual specifications sections.

1.10 Spare Parts

.1 Provide spare parts, in quantities specified in individual specification sections.

.2 Provide items of same manufacture and quality as items in Work.

.3 Deliver to Owner as directed; place and store.

.4 Receive and catalogue all items. Submit inventory listing to City’s Representative. Include approved listings in Maintenance Manual.

.5 Obtain receipt for delivered products and submit prior to final payment.

1.11 Maintenance Materials

.1 Provide maintenance and extra materials, in quantities specified in individual specification sections.

.2 Provide items of same manufacture and quality as items in Work.

.3 Deliver to Owner as directed; place and store.

.4 Receive and catalogue all items. Submit inventory listing to City’s Representative. Include approved listings in Maintenance Manual.

.5 Obtain receipt for delivered products and submit prior to final payment.

1.12 Special Tools

.1 Provide special tools, in quantities specified in individual specification section.

.2 Provide items with tags identifying their associated function and equipment.

.3 Deliver to Owner as directed; place and store.

.4 Receive and catalogue all items. Submit inventory listing to City's Representative. Include approved listings in Maintenance Manual.

1.13 Storage, Handling and Protection

.1 Store spare parts, maintenance materials, and special tools in manner to prevent damage or deterioration.

.2 Store in original and undamaged condition with manufacturer's seal and labels intact.

.3 Store components subject to damage from weather in weatherproof enclosures.

.4 Store paints and freezable materials in a heated and ventilated room.

.5 Remove and replace damaged products at own expense and to satisfaction of City's Representative.

1.14 Warranties and Bonds

.1 Separate each warranty or bond with index tab sheets keyed to Table of Contents listing.

.2 List subcontractor, supplier, and manufacturer, with name, address, and telephone number of responsible principal.

.3 Obtain warranties and bonds, executed in duplicate by subcontractors, suppliers, and manufacturers, within 10 days after completion of the applicable item of work.

.4 Except for items put into use with Owner's permission, leave date of beginning of time of warranty until the Date of Substantial Performance is determined.

.5 Verify that documents are in proper form, contain full information, and are notarized.

.6 Co-execute submittals when required.

.7 Retain warranties and bonds until time specified for submittal.

PART 2 PRODUCTS

2.1 Not used.

PART 3 EXECUTION

3.1 Not used.

END OF SECTION

PART 1 - GENERAL

1.1 Environmental Requirements

.1 Operation of construction equipment in water is prohibited.

.2 Operation of construction equipment between water and sediment control fence is prohibited.

.3 Operation of construction equipment outside of Limit of Work is prohibited.

.4 Constructing temporary crossings of watercourses is prohibited.

.5 Dumping excavated fill, waste material, or debris in watercourse is prohibited.

PART 2 - PRODUCTS

2.1 Preparation

.1 Ensure all proposed sediment control fencing is properly installed in place prior to any trail installation work.

.2 Inspect all existing sediment control fencing to ensure proper functioning prior to any construction work. Notify City's Representative immediately if breaches are occurring.

PART 3 - EXECUTION

3.1 Watson Creek

.1 Maintain existing flow pattern in natural watercourse systems.

3.2 Site Clearing and Plant Protection

.1 Conduct work to provide minimal disturbance to existing terrestrial and aquatic vegetation. Protect trees and vegetation on site and adjacent properties where indicated.

.2 Wrap in burlap, trees and shrubs adjacent to construction work, storage areas and access routes.

.3 Protect roots of designated trees to dripline during excavation and site grading to prevent disturbance or damage. Avoid unnecessary traffic, dumping and storage of materials over root zone.

.4 Remove trees and other vegetation only identified and directed by City's Representative per Section 02310 – Clearing and Grubbing and Section 02320 – Tree Pruning.

.5 Maintain temporary erosion and pollution control features installed under this Contract.

3.3 Drainage

.1 Pumping water containing suspended materials into watercourse is prohibited.

.2 Establish rock chute spillways to accommodate safe surface water entry to watercourse only as instructed by the City's Representative.

END OF SECTION

PART 1 GENERAL

1.1 Related Sections

.1 Section 02310 - Clearing and Grubbing.

.2 Section 02224 - Excavation, Trenching and Backfilling.

.3 Geotechnical Investigation report (EXP KCH-00211557-A0, April 2013).

1.2 References

.1 American Society for Testing and Materials (ASTM)

.1 ASTM D698-[91(1998)], Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort (600 kN-m/m^3).

1.3 Existing Conditions

.1 Examine Geotechnical Investigation report which forms part of this specification following Section 03421.

.2 Known underground and surface utility lines and buried objects are as indicated on drawings.

.3 Refer to dewatering in Section 02224 - Excavating Trenching and Backfilling.

1.4 Protection

.1 Protect and/or transplant existing silt fencing, trees, shrubs, bench marks, buildings, pavement, surface or underground utility lines which are to remain as outlined on drawings. If damaged, restore to original or better condition unless directed otherwise.

.2 Maintain access roads to prevent accumulation of construction related debris on roads.

PART 2 PRODUCTS

2.1 Materials

.1 Fill material: Type 3 in accordance with of Section 02224 - Excavating, Trenching and Backfilling.

.2 Excavated or graded material existing on site may be suitable to use as fill for grading work if approved by City's Representative.

PART 3 EXECUTION

3.1 Stripping of Topsoil

.1 Do not handle topsoil while in wet or frozen condition or in any manner in which soil structure is adversely affected as determined by City's Representative.

.2 Strip topsoil to depths as indicated. Rototill weeds and grasses and retain as topsoil on site. . Avoid mixing topsoil with subsoil.

.3 Stockpile in locations as directed by City's Representative. Stockpile height not to exceed 2 m.

.4 Dispose of unused topsoil off site.

3.2 Proof Rolling

.1 Following the removal of topsoil and organic layers, proof roll the exposed subgrade surfaces with a heavy roller to achieve what level of compaction?

.2 Notify City's Representative once proof rolling is complete for review prior to installation of fill and base courses.

.3 Any soft or loose areas shall be sub-excavated and replaced with ___ material

3.3 Rough Grading

.1 Rough grade to levels, profiles, and contours allowing for surface treatment as indicated.

.2 Rough grade to following depths below finish grades:

- .1 150 mm minimum for grassed areas.
- .2 600 mm for planting beds.
- .3 As indicated on drawings for asphalt paving.
- .4 As indicated on drawings for concrete paving.
- .5 As indicated on drawings for stone dust paving.

.3 Slope rough grade as indicated.

.4 Grade swales to depth as indicated.

.5 Prior to placing fill over existing ground, scarify surface to depth of 150 mm. Maintain fill and existing surface at approximately same moisture content to facilitate bonding.

.6 Place fill in maximum 300mm lifts.

.7 Compact filled and disturbed areas to Standard Proctor Maximum Dry Density (SPMDD) to ASTM D698, as follows:

- .1 85% under landscape areas.
- .2 98 % under paved and walk areas.

.8 Do not disturb soil within branch spread of trees or shrubs to remain.

3.4 Testing

.1 Inspection and testing of soil compaction will be carried out by testing laboratory as outlined in Section 01450 - Quality Control and Testing.

3.5 Surplus Material

.1 Remove surplus material and material unsuitable for fill, grading or landscaping off site.

END OF SECTION

PART 1 - GENERAL

1.1 **Scope of Work**

.1 Utilize existing topsoil in place to the greatest extent possible. Where required, amend existing topsoil to meet requirements of this specification. Import additional topsoil as required. For use in seeded and sodded areas.

1.2 **Related Work**

.1 Section 02935 – Hydraulic Seeding.

.2 Section 02938 – Sodding.

PART 2 - PRODUCTS

2.1 **Materials**

.1 Existing topsoil in place on site: mixture of mineral particulates, micro-organisms and organic matter which provides suitable medium for supporting intended plant growth.

.2 Imported topsoil: screened, mixture of mineral particulates, micro-organisms and organic matter which provides suitable medium for supporting intended plant growth.

.1 Soil texture based on The Canadian System of Soil Classification, to consist of 40-60% sand, 20-40% silt, 6-10% clay, and contain 2-5% organic matter by weight.

.2 Fertility: major soil nutrients present in following ratios:

.1 Nitrogen (N): 20 to 40 micrograms of available N per gram of topsoil.

.2 Phosphorus (P): 10 to 20 micrograms of phosphate per gram of topsoil.

.3 Potassium (K): 80 to 120 micrograms of potash per gram of topsoil.

.4 Calcium, magnesium, sulphur and micro-nutrients present in balanced ratios to support germination and/or establishment of intended vegetation.

.3 Contain no toxic elements or growth inhibiting materials.

.4 Free from all debris; stones over 40 mm diameter; coarse vegetative material, 10 mm diameter and 100 mm length, occupying more than 2% of soil volume.

.5 Consistency: friable when moist.

.3 Compost: A mixture of soil and decomposing organic matter used as a fertilizer, mulch, or soil conditioner. Compost is processed organic matter containing 40% or more organic matter as determined by the Walkley-Black or LOI test. Product must be sufficiently decomposed (i.e. stable) so that any further decomposition does not

adversely affect plant growth (C:N ratio below 25), and contain no toxic or growth inhibiting contaminates. Composed bio-solids must meet the requirements of the Guidelines for Compost Quality, Category A produced by the Canadian Council of the Ministers of the Environment (CCME), January 1996.

PART 3 - EXECUTION

3.1 **Preparation of Areas to Receive Topsoil**

.1 Verify that trail grades are correct. If discrepancies occur, notify Consultant and do not commence work until further instructed.

.2 Grade soil, eliminating uneven areas and low spots, ensuring positive drainage.

.3 Remove debris, roots, branches, stones in excess of 75 mm diameter and other deleterious materials. Remove soil contaminated with calcium chloride, toxic materials and petroleum products. Remove debris that protrudes more than 75 mm above surface. Dispose of removed material off site.

.4 Coarse cultivate entire area that is to receive topsoil to depth of 100 mm. Cross cultivate those areas where equipment has compacted soil.

3.2 **Preparation of Topsoil**

.1 Existing stockpiled topsoil to be blended with imported compost material to create specified topsoil.

.2 Thoroughly blend and screen soils on site to meet requirements of this specification.

.3 Remove all materials not required from site.

3.3 **Placing and Spreading of Topsoil**

.1 Place approved topsoil after trail installation has been accepted.

.2 Spread soil mixes in uniform layers not exceeding 150 mm, over unfrozen subgrade free of standing water.

.3 Spread topsoil to following minimum depths after settlement and compaction: 200 mm for all seeded and sodded areas.

.4 Manually spread topsoil around trees and obstacles.

3.4 **Finish Grading**

.1 Grade to eliminate rough spots and low areas and ensure positive drainage. Prepare loose friable bed by means of cultivation and subsequent raking.

.2 Ensure finished grades conform to approved plans.

.3 Consolidate topsoil to leave surfaces smooth, uniform and firm against deep foot printing.

3.5 Acceptance

.1 The Consultant will inspect topsoil in place and determine acceptance of material, depth of topsoil and finish grading.

3.6 Surplus Material

.1 Dispose of materials not required off site.

END OF SECTION

PART 1 GENERAL

1.1 Summary

.1 Section Includes:

.1 Materials, applications, installation and verification for excavating, trenching and backfilling.

.2 Related Sections:

.1 Section 01330 - Submittal Procedures.
.2 Section 01353 - Health and Safety Requirements.
.3 Section 01450 – Quality Control and Testing.
.4 Section 01560- Temporary Barriers and Enclosures.
.5 Section 02498 - Geotextiles.

1.2 References

.1 American Society for Testing and Materials International (ASTM)

.1 ASTM C117-04, Standard Test Method for Material Finer Than 0.075 mm (No.200) Sieve in Mineral Aggregates by Washing.

.2 ASTM C136-05 Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.

.3 ASTM D422-63 2002, Standard Test Method for Particle-Size Analysis of Soils.

.4 ASTM D698-00ae1, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft 3) (600 kN-m/m 3).

.5 ASTM D1557-02e1, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft 3) (2,700 kN-m/m 3).

.6 ASTM D4318-05, Standard Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils.

.2 Canadian General Standards Board (CGSB)

.1 CAN/CGSB-8.1-88, Sieves, Testing, Woven Wire, Inch Series.

.2 CAN/CGSB-8.2-M88, Sieves, Testing, Woven Wire, Metric.

.3 Canadian Standards Association (CSA International)

.1 CAN/CSA-A3000-03, Cementitious Materials Compendium (Consists of A3001, A3002, A3003, A3004 and A3005).

.2 CSA-A3001-03, Cementitious Materials for Use in Concrete.

.3 CAN/CSA-A23.1/A23.2-04, Concrete Materials and Methods of Concrete Construction/Methods of Test for Concrete.

1.3 Definitions

.1 Common excavation: excavation of materials of whatever nature, which are not included under definitions of rock excavation.

.2 Unclassified excavation: excavation of deposits of whatever character encountered in Work.

.3 Topsoil:

.1 Material capable of supporting good vegetative growth and suitable for use in top dressing, landscaping and seeding.

.2 Material reasonably free from subsoil, clay lumps, brush, objectionable weeds, and other litter, and free from cobbles, stumps, roots, and other objectionable material larger than 25 millimeters in any dimension.

.4 Waste material: excavated material unsuitable for use in Work or surplus to requirements.

.5 Borrow material: material obtained from locations outside area to be graded, and required for construction of fill areas or for other portions of Work.

.6 Recycled fill material: material, considered inert, obtained from alternate sources and engineered to meet requirements of fill areas.

.7 Unsuitable materials:

.1 Weak, chemically unstable, and compressible materials.

.2 Frost susceptible materials:

.1 Fine grained soils with plasticity index less than 10 when tested to ASTM D4318, and gradation within limits specified when tested to ASTM D422 and ASTM C136 : Sieve sizes to CAN/CGSB-8.1.

.8 Unshrinkable fill: very weak mixture of Portland cement, concrete aggregates and water that resists settlement when placed in utility trenches, and capable of being readily excavated.

1.4 Submittals

.1 Make submittals in accordance with Section 01330 - Submittal Procedures.

.2 Quality Control in accordance with Section 01450 – Quality control and Testing:

.1 Submit condition survey of existing conditions as described in EXISTING CONDITIONS article of this Section.

.2 Submit for review by City's Representative proposed dewatering and heave prevention methods as described in PART 3 of this Section.

.3 Submit to City's Representative written notice at least 7 days prior to excavation work, to ensure cross sections are taken.

.4 Submit to City's Representative written notice when bottom of excavation is reached.

.5 Submit to City's Representative testing and inspection results. Report as described in PART 3 of this Section.

.3 Preconstruction Submittals:

.1 Submit construction equipment list for major equipment to be used in this section prior to start of Work.

.2 Submit records of underground utility locates, indicating: [location plan of existing utilities as found in field.

1.5 Quality Assurance

.1 Qualification Statement: submit proof of insurance coverage for professional liability.

.2 Submit design and supporting data at least 2 weeks prior to beginning Work.

.3 Design and supporting data submitted to bear stamp and signature of qualified professional engineer registered or licensed in Province of Ontario, Canada.

.4 Keep design and supporting data on site.

.5 Engage services of qualified professional Engineer who is registered or licensed in Province of Ontario, Canada in which Work is to be carried out to design and inspect cofferdams, shoring, bracing and underpinning required for Work.

.6 Do not use soil material until written report of soil test results are reviewed and approved by City's Representative.

.7 Health and Safety Requirements:

.1 Do construction occupational health and safety in accordance with Section 01353 - Health and Safety Requirements.

1.6 Existing Conditions

.1 Examine geotechnical report available with specification package.

.2 Buried services:

.1 Before commencing work verify location of buried services on and adjacent to site.

.2 Arrange with appropriate authority for relocation of buried services that interfere with execution of work: pay costs of relocating services.

.3 Remove obsolete buried services within 2m of foundations: cap cut-offs.

.4 Size, depth and location of existing utilities and structures as indicated are for guidance only. Completeness and accuracy are not guaranteed.

.5 Prior to beginning excavation Work, notify applicable authorities having jurisdiction establish location and state of use of buried utilities and structures. Authorities having jurisdiction to clearly mark such locations to prevent disturbance during Work.

.6 Confirm locations of buried utilities by careful test excavations and/or soil hydrovac methods.

.7 Maintain and protect from damage, water, sewer, gas, electric, telephone and other utilities and structures encountered.

.8 Record location of maintained, re-routed and abandoned underground lines.

.3 Existing surface features:

.1 Conduct, with City's Representative, condition survey of existing, trees and other plants, lawns, fencing, service poles, wires, pavement, survey bench marks and monuments which may be affected by Work.

.2 Protect existing surface features from damage while Work is in progress. In event of damage, immediately make repair as directed by City's Representative.

.3 Where required for excavation, cut roots or branches as directed by City's Representative in accordance with Section 02320 – Tree Pruning.

PART 2 PRODUCTS

2.1 Materials

.1 Type 1 and Type 2 fill: properties to OPSS 1010 and the following requirements:

.1 Crushed, pit run or screened stone, gravel or sand.

.2 Granular A, B, M and select sub-grade, clean stone.

.2 Type 3 fill: selected material from excavation on site or other sources, approved by City's Representative for use intended, unfrozen and free from rocks larger than 75 mm, cinders, ashes, sods, refuse or other deleterious materials.

.3 Unshrinkable fill: proportioned and mixed to meet OPSS 1359 – Unshrinkable Backfill.

.4 Shearmat: honeycomb type bio-degradable cardboard 100 mm thick, treated to provide sufficient structural support for poured concrete until concrete cured.

.5 Geotextiles: to Section 02498 - Geotextiles.

.6 Geogrid Soil Reinforcement: to Section 02874 – Geogrid Soil Reinforcement

PART 3 EXECUTION

3.1 Temporary Erosion and Sedimentation Control

.1 Provide temporary erosion and sedimentation control measures to prevent soil erosion and discharge of soil bearing water runoff or airborne dust to adjacent properties and walkways, according to requirements of authorities having jurisdiction and sediment and erosion control drawings.

.2 Inspect, repair, and maintain erosion and sedimentation control measures during construction until permanent vegetation has been established.

.3 Remove erosion and sedimentation controls and restore and stabilize areas disturbed during removal.

3.2 Site Preparation

.1 Remove obstructions, ice and snow, from surfaces to be excavated within limits indicated.

3.3 Stripping of Topsoil

.1 Begin topsoil stripping of areas as indicated on drawings after areas have been cleared and grubbed of trees and shrubs as indicated on drawings and removed from site.

.2 Strip topsoil to depths as indicated on drawings. Do not mix topsoil with subsoil.

.3 Stockpile in locations as indicated on drawings. Stockpile height not to exceed 2 m and should be protected from erosion.

.4 Dispose of unused topsoil off site.

3.4 Stockpiling

.1 Stockpile fill materials in areas designated by City's Representative. Stockpile granular materials in manner to prevent segregation.

.2 Protect fill materials from contamination.

.3 Implement sufficient erosion and sediment control measures to prevent sediment release off construction boundaries and into water bodies.

3.5 Cofferdams, Shoring, Bracing and Underpinning

.1 Maintain sides and slopes of excavations in safe condition by appropriate methods and in accordance with Section 01353 - Health and Safety Requirements.

.2 Where conditions are unstable, City's Representative to verify and advise methods.

.3 During backfill operation:

.1 Unless otherwise indicated or directed by City's Representative, remove sheeting and shoring from excavations.

.2 Do not remove bracing until backfilling has reached respective levels of such bracing.

.3 Pull sheeting in increments that will ensure compacted backfill is maintained at elevation at least 500 mm above toe of sheeting.

.4 When sheeting is required to remain in place, cut off tops at elevations as indicated.

.5 Upon completion of substructure construction:

.1 Remove cofferdams, shoring and bracing.

.2 Remove excess materials from site and restore watercourses as directed by City's Representative.

3.6 Dewatering and Heave Prevention

.1 Ground water conditions are provided as per the Geotechnical Investigational City's Representatives investigation. The Owner and City's Representative will accept no responsibility for the accuracy of completeness of the information and recommendations in the report or the Contractor's interpretation thereof.

.2 Keep excavations free of water while Work is in progress.

.3 Submit for City's Representative's review details of proposed dewatering or heave prevention methods, including dikes, well points, and sheet pile cut-offs.

.4 Avoid excavation below groundwater table if quick condition or heave is likely to occur.

.1 Prevent piping or bottom heave of excavations by groundwater lowering, sheet pile cut-offs, or other means.

.5 Protect open excavations against flooding and damage due to surface run-off.

3.7 Excavation

.1 Excavate to lines, grades, elevations and dimensions as indicated on drawings.

.2 Remove concrete, masonry, paving, walks, demolished foundations and rubble and other obstructions encountered during excavation.

.3 Excavation must not interfere with bearing capacity of adjacent foundations.

.4 Do not disturb soil within branch spread of trees or shrubs that are to remain.

.1 If excavating through roots, excavate by hand and cut roots with sharp axe or saw.

.5 For trench excavation, unless otherwise authorized by City's Representative in writing, do not excavate more than 30 m of trench in advance of installation operations and do not leave open more than 15 m at end of day's operation.

.6 Keep excavated and stockpiled materials safe distance away from edge of trench as directed by City's Representative.

.7 Restrict vehicle operations directly adjacent to open trenches.

.8 Dispose of surplus and unsuitable excavated material off site.

.9 Do not obstruct flow of surface drainage or natural watercourses.

.10 Earth bottoms of excavations to be undisturbed soil, level, free from loose, soft or organic matter.

.11 Notify City's Representative when bottom of excavation is reached.

.12 Obtain City's Representative approval of completed excavation.

.13 Remove unsuitable material from trench bottom including those that extend below required elevations to extent and depth as directed by City's Representative.

.14 Correct unauthorized over-excavation as directed by the approved geotechnical City's Representative at no additional cost to the Owner.

.15 Hand trim, make firm and remove loose material and debris from excavations.

.16 The Contractor shall not allow the sides of the excavation to become unsafe and shall provide, place and maintain such sheeting, strutting and wailing, etc. except where the Owner's Agent orders, in writing, that they be left in place after the work is complete.

.17 All excavation shall be in accordance with the current "Occupational Health and Safety Act and regulations for construction Projects" and all other applicable provincial legislation.

.18 The control of siltation shall be the Contractor's responsibility throughout the undertaking of this contract. The Contractor shall not permit sediment to leave the work zone area. The Contractor shall be responsible for cleanup of mud-tracking daily and is to be included in Tender prices.

.19 If the Contractor encounters any of the designated substances under the Occupational Health and Safety Act, he shall stop all work and notify the Owner prior to undertaking and further work. The Contractor will not be compensated for any work stoppage due to the presence of designated substances. The notification does not negate the contractor's responsibility under regulation 346 and 347/558 of the Ministry of the Environment regarding Air Quality and Waste Management respectively.

.20 If suspect waste material is exposed during excavation, stop work and identify area to City's Representative. Assist City's Representative in obtaining soil samples for characterization of the waste. Place suspect waste material in approved location on sites, as identified by the City's Representative.

3.8 Fill Types and Compaction

.1 Use types of fill as indicated. Compaction densities are percentages of maximum densities obtained from ASTM D698.

.1 Compact base courses to 100 %.

.2 Place unshrinkable fill in areas as indicated.

3.9 Bedding and Surround of Underground Services

.1 Place and compact granular material for bedding and surround of underground services as indicated on drawings. Place bedding and surround material in unfrozen condition.

3.10 Backfilling

.1 Do not proceed with backfilling operations until completion of following:

.1 City's Representative has inspected and approved installations.

.2 City's Representative has inspected and approved of construction below finish grade.

.3 Inspection, testing, approval, and recording location of underground utilities.

.4 Removal of concrete formwork.

.5 Removal of shoring and bracing; backfilling of voids with satisfactory soil material.

.2 Areas to be backfilled to be free from debris, snow, ice, water and frozen ground.

.3 Do not use backfill material which is frozen or contains ice, snow or debris.

.4 Place backfill material in uniform layers not exceeding 150 mm compacted thickness up to grades indicated. Compact each layer before placing succeeding layer.

.5 Backfilling around installations.

.1 Place bedding and surround material as specified elsewhere.

.2 Do not backfill around or over cast-in-place concrete within 24 hours after placing of concrete.

.3 Place layers simultaneously on both sides of installed Work to equalize loading. Difference not to exceed 1 m.

.4 Where temporary unbalanced earth pressures are liable to develop on walls or other structures:

.1 Permit concrete to cure for minimum 14 days or until it has sufficient strength to withstand earth and compaction pressure and approval obtained from City's Representative.

.6 Place unshrinkable fill in areas as indicated.

.7 Consolidate and level unshrinkable fill with internal vibrators.

.8 Install drainage system in backfill as directed by City's Representative.

3.11 Restoration

.1 Upon completion of Work, remove waste materials and debris, trim slopes, and correct defects as directed by City's Representative.

.2 Replace topsoil City's Representative.

.3 Reinstate lawns to elevation which existed before excavation.

.4 Reinstate pavements and sidewalks disturbed by excavation to thickness, structure and elevation which existed before excavation.

.5 Clean and reinstate areas affected by Work as directed by City's Representative.

.6 Use temporary plating to support traffic loads over unshrinkable fill for initial 24 hours.

.7 Protect newly graded areas from traffic and erosion and maintain free of trash or debris.

END OF SECTION

PART 1 - GENERAL

1.1 Definitions

.1 Clearing consists of cutting off trees and brush vegetative growth to not more than a specified height above ground and disposing of felled trees, previously uprooted trees and stumps, and surface debris.

.2 Clearing isolated trees consists of cutting off to not more than specified height above ground of designated trees, and disposing of felled trees and debris.

.3 Grubbing consists of excavation and disposal of stumps and roots below existing ground surface.

1.2 Storage and Protection

.1 Prevent damage to fencing, trees, natural features, bench marks, utility lines, water courses, water bodies, wetlands and root systems of trees which are to remain.

.1 Repair any damaged items to approval of City's Representative.

.2 Replace any trees designated to remain, if damaged, as directed by City's Representative.

1.3 Limitations

.1 Clearing and grubbing shall comply with the requirements of the Migratory Birds Convention Act (1994). All removals of vegetation from the property will be scheduled to be completed outside of the migratory bird nesting season (May 1 - July 31). Vegetation removal within this period will only be completed if a qualified biologist determines that the proposed removal will not affect the nesting activity of migratory birds.

PART 1 - PRODUCTS

1.1 Not used.

PART 2 - EXECUTION

2.1 Preparation

.1 Inspect site and verify with City's Representative, items designated to remain.

2.2 Clearing

.1 Clear as indicated on drawings, by cutting at a height of not more than 150 mm above ground.

.2 Cut off branches and cut down trees overhanging area cleared as directed by City's Representative.

.3 Cut off unsound branches on trees designated to remain as directed by City's Representative per Specification 02320 – Tree Pruning.

2.3 Isolated Trees

.1 Cut off isolated trees designated to be cut only at height of not more than 100 mm above ground surface.

.2 Cut off isolated trees designated to be cleared and grubbed at height of not more than 300 mm above ground surface.

2.4 Grubbing

.1 Only those trees clearly identified by City's Representative are to be grubbed.

.2 Provide measures to contain grubbing area immediately around tree to prevent migration of soils or other materials beyond Limit of Work.

.3 Grub out stumps and roots to not less than 300 mm below ground surface unless otherwise directed by City's Representative.

.4 Only grub out rock fragments and boulders that are in the way of proposed work.

2.5 Removal and Disposal

.1 Remove cleared and grubbed materials off site.

2.6 Finished Surface

.1 Leave ground surface in the same condition before work commenced to approval of City's Representative.

.2 Do not leave any ground surface in a condition that is prone to erosion.

END OF SECTION

PART 1 - GENERAL

1.1 References

.1 Canadian Nursery Landscape Association (CNLA).

.2 International Society of Arboriculture (ISA)

.3 Ontario Ministry of Agriculture, Food and Rural Affairs.

.1 Pruning Ornamentals (#483)-[1992].

1.2 Qualifications

.1 Labourers to possess International Society of Arboriculture and/or Canadian Nursery Landscape Association certification.

.2 Labourers to possess safety certificate or equivalent as approved by local hydro utility.

1.3 Field Sample

.1 Do sample pruning acceptable to City's Representative to identify:

.1 Knowledge of target areas including branch bark ridge and branch collars.

.2 Acceptance of Work will be determined by City's Representative from field sample.

1.4 Waste Management and Disposal

.1 Remove from site and dispose of all packaging materials at appropriate recycling or disposal facilities.

.2 Place materials defined as hazardous or toxic in designated containers.

.3 Dispose of unused disinfectant at official hazardous material collections site approved by City's Representative.

.4 Do not dispose of unused disinfectant into sewer system, into water courses, water bodies, wetlands, onto ground or in other location where it will pose health or environmental hazard.

1.5 Maintenance

.1 Tool maintenance:

.1 Ensure that tools are clean and sharp throughout pruning operation. Do not use tools which crush or tear bark.

.2 Disinfect tools before each tree is pruned.

.3 On diseased plant material disinfect tools before each cut.

PART 2 - PRODUCTS

2.1 Disinfectant

.1 20% solution of sodium hypochlorite or 70% solution of ethyl alcohol.

PART 3 - EXECUTION

3.1 General

.1 Prune in accordance with ISA standards and as directed by City's Representative. Where discrepancies occur between standard and specifications, specifications govern.

.2 Notify immediately City's Representative conditions detrimental to health of plant material or operations.

.3 Prune during plant dormant period or after leaves have matured. Avoid pruning during leaf formation, at time of leaf fall, or when seasonal temperature drops below minus 10^{o}C.

.4 Retain natural form and shape of plant species.

.5 Do not:

.1 Flush cut branches.
.2 Crush or tear bark.
.3 Cut behind branch bark ridge.
.4 Damage branch collars.
.5 Damage branches to remain.

3.2 Pruning

.1 Only remove branches within clearing limits as outlined on drawings and approved by City's Representative.

.2 Remove dead, dying, diseased and weak growth from plant material designated by City's Representative in order to promote healthy growth.

.3 Remove live branches that are broken as designated by City's Representative.

.4 Remove loose branches, twigs and other debris lodged in tree.

.5 Remove vines.

.6 For branches under 50 mm in diameter:

.1 Locate branch bark ridge and make cuts smooth and flush with outer edge of branch collar to ensure retention of branch collar. Cut target area to bottom of branch collar at angle equal to that formed by line opposite to branch bark ridge.
.2 Make cuts on dead branches smooth and flush with swollen callus collar. Do not injure or remove callus collar.
.3 Do not cut lead branches unless directed by City's Representative.

.7 For branches greater than 50 mm in diameter:

.1 Make first cut on lower side of branch 300 mm from trunk, one third diameter of branch.

.2 Make second cut on upper side of branch 500 mm from trunk until branch falls off.

.3 Make final cut adjacent to and outside branch collar.

.8 Ensure that trunk bark and branch collar are not damaged or torn during limb removal. Repair areas which are damaged, or remove damaged area back to next branch collar.

.9 Remove additional growth designated by City's Representative.

3.3 Root Girdling

.1 For girdling roots one-quarter size of trunk diameter or larger, V-cut girdling root one-half way through at point where root is crossing.

.2 Remove exposed portion of girdling root as directed by City's Representative after cleanly cutting root flush with grade on each side of parent root. Do not injure bark or parent root.

3.4 Care of Wounds

.1 Shape bark around wound to oblong configuration ensuring minimal increase in wound size. Retain peninsulas of existing live bark.

3.5 Clean-up

.1 Collect and dispose of off site pruned material daily.

END OF SECTION

PART 1 - GENERAL

1.1 Delivery and Storage

.1 During delivery and storage, protect geotextiles from direct sunlight, ultraviolet rays, excessive heat, mud, dirt, dust, debris and rodents.

1.2 Submittals

.1 Samples:

.1 Submit one minimum 600 mm x 600 mm sample of geotextile.

PART 2 - PRODUCTS

2.1 Material

.1 Geotextile: Terrafix 270R non-woven or approved equal.

.2 Securing pins and washers: to CAN/ CSA-G4O.21, Grade 300W, hot-dipped galvanized with minimum zinc coating of 600g/m^2 to CAN/CSA G164.

PART 3 - EXECUTION

3.1 Installation

.1 Place geotextile material smooth and free of tension stress, folds, wrinkles and creases.

.2 Overlap each successive strip of geotextile 600 mm over previously laid strip.

.3 Protect installed geotextile material from displacement, damage or deterioration before, during and after placement of material layers.

.4 After installation backfill within 4 hours of placement.

.5 Replace damaged or deteriorated geotextile to approval of City's Representative.

END OF SECTION

PART 1 – GENERAL

1.1 Related Work

.1 Section 02210 - Rough Grading.

.2 Section 02224 - Excavating, Trenching and Backfilling.

1.2 Reference Standards

.1 Work covered under this section, unless otherwise noted of detailed, shall be in accordance with the following standards and codes:

.1 Ontario Provincial Standard Specifications and Drawings (OPSS, OPSD).

1.3 Samples

.1 Submit samples in accordance with Section 01330 - Submittal Procedures.

.2 Submit to the City, samples of material for sieve analysis at least 3 weeks before commencing asphalt work.

1.4 OPSS Forms

.1 The Contractor shall have the current copies of all OPSS forms and details mentioned in this specification on the site for the duration of this work.

1.5 Delivery and Storage of Materials

.1 Coarse and fine aggregates shall be stored separately, in free draining stockpiles and in such a manner as to prevent contamination and segregation.

1.6 Protection

.1 Keep vehicular traffic off newly paved areas until paving surface temperature has cooled below 38 degrees C. Do not permit stationary loads on pavement until 24 hours after placement.

1.7 Quality Assurance and Testing

.1 The asphalt contractor shall have a minimum of five (5) years of experience in asphalt paving work.

.2 Asphalt plants, spreading equipment and rollers and asphalt paving to meet the requirements of the current applicable OPSS sections.

.3 Haul trucks to be of adequate size, spread and condition to ensure orderly and continuous operation. Employ suitable hand tools.

.4 It is the responsibility of the Contractor to contact the testing laboratory for tests and to give them timely notice.

.5 If any test does not meet the specifications, it will be the Contractor's responsibility to remedy the work and pay for all subsequent testing necessary to achieve the specified results.

.6 Testing to be conducted for this section of work is as follows:

.1 subgrade to be minimum 98% Standard Proctor Maximum Dry Density.

.2 Granular A compacted to 100% Standard Proctor Maximum Dry Density.

.3 Granular B compacted to 100% Standard Proctor Maximum Dry Density.

.4 Asphalt to be tested for content and grain size and mix.

PART 2 - PRODUCTS

2.1 Materials

.1 Granular Sub-Base

.1 Granular B “1” per OPSS 1010.

.2 Clean, hard, durable sand, gravel or crushed stone, free from shale, clay, friable materials, organic matter and other deleterious substances and graded within the following limits when tested and giving a smooth curve without sharp breaks when plotting a semi-log grading chart.

.3 Table:

Sieve Designation	% Passing
150 mm	100
26.5 mm	50-100
4.75 mm	20-100
1.18 mm	10-100
0.300 mm	2-65
0.075 mm	0-8

.2 Granular Base

.1 Granular ‘A’ per OPSS 1010.

.2 Clean, hard, durable sand, gravel or crushed stone, free from shale, clay, friable materials, organic matter and other deleterious substances and graded within the following limits when tested and giving a smooth curve without sharp breaks when plotting a semi-log grading chart:

.3 Table

Sieve Designation	% Passing
26.5 mm	100
19.0 mm	85-100
13.2 mm	65-90
9.5 mm	50-73
4.75 mm	35-55
1.18 mm	15-40
0.300 mm	5-22
0.075 mm	2-8

.3 Prime Coat: MTO Primer or SS-1 to OPSS 1103.

.4 Tack Coat: SS-1 to OPSS 1103.

.5 Asphalt Concrete: to OPSS 1150.

.1 Hot mix, hot laid HL3A as indicated on drawings.

.2 Hot mix, hot laid HL8 as indicated on drawings.

.6 Asphalt cement: to conform to OPSS 1150.

PART 3 - EXECUTION

3.1 Site Preparation

.1 Set out work to lines and levels shown on Drawings. Gain approval from the City's Representative of all works prior to installation. Maintain such lines and levels for duration of work.

.2 Excavate and prepare all bases as noted on details. Remove and dispose of existing unsuitable subgrade materials off site.

.3 Verify grades of subgrade for conformity with elevations and sections before placing base material.

.4 Disturbed subgrade or clean fill shall be compacted to 98% of Standard Proctor Density in accordance with ASTM D698-70.

.5 If required, place sub-base material in 75 mm lifts, compacting each lift to 98% S.P.D.

.6 Gain final sub-grade approval by the City's Representative prior to placing base material.

3.2 Asphalt Paving – General

.1 On the base course, lay a hot mix, hot laid asphaltic binder course finished to the required thickness.

.2 All paving shall have a uniform grade to adequately surface drain the area and be free from depressions in excess of 3mm under a 3m straight edge.

.3 Over the base paving course install a hot mix, hot laid asphaltic cement surface course finished to the required thickness.

.4 Joints between old and new pavement or between successive day's work shall be carefully made in such a manner to ensure a thorough and continuous bond between the old and new surfaces. Joints between surface courses shall be staggered from the joints in the underlying course. Make keyed or butt joints, feathering will not be permitted.

.5 Hand tamp the asphalt with hot tampers adjacent trees, sidewalks, landscape features, etc.

.6 Finish asphalt surfaces straight and true to established levels, free from cracks undrained areas of depressions exceeding 3mm as measured with a 3m straight edge paralleling the center line of the crowned profile. Asphalt shall not vary more than 6mm from the specified thickness. Crown changes in slopes to a gradual curve.

.7 Remove any asphalt materials and stains from adjacent finished surfaces.

3.3 Granular Base

.1 Exercise due care at all times to prevent base material from becoming contaminated by clay or other types of deleterious materials.

.2 Place base and sub-base material only on clean unfrozen surface, properly shaped and compacted, and free from snow and ice.

.3 Place granular base to compacted thickness as indicated on drawings.

.4 Place in layers not exceeding 150mm compacted thickness. Compact to density not less than 100% Standard Proctor Maximum Dry Density with ASTM D698-78.

.5 Finish base surface to be within 10mm of specified grade and shall not deviate more than 3mm on a 3m template.

.6 Gain approval from the City of the installed base course. Approval to place asphalt shall be contingent upon the condition of base test results indicating that the required compaction has been achieved.

3.4 Transportation of Mix

.1 Transport mix to job site in vehicles cleaned of foreign material.

.2 Paint or spray truck beds with light oil, limewater, soap or detergent solution, at least once a day or as required. Elevate truck bed and thoroughly drain. No excess solution will be permitted.

.3 Schedule delivery of material for placing during daylight hours.

.4 Deliver material to pave at a uniform rate and in an amount within the capacity of the paving and compacting equipment.

.5 Deliver loads continuously in covered vehicles and immediately spread and compact. Deliver and place mixes at a temperatures recommended by OPSS documents.

.6 Air temperature during placing of mixture shall be minimum 7ºC (45ºF) and rising. Temperature of mixture when spread shall be not less than 120ºC (245ºF) nor more than 150ºC (300ºF). Do not increase temperature of mixture to offset long distance hauling.

3.5 Asphalt Concrete Paving

.1 Place asphalt mix only when base or previous course is dry and air temperature is above 7 degrees C (44 degrees F).

.2 When temperature of surface on which material is top be placed falls below 10 degrees C (50 degrees F), provide extra rollers as necessary to obtain required compaction before cooling.

.3 Do not place hot mix asphalt when pools of standing water exist on surface to be paved, during rain, or when surface is damp.

.4 Place asphalt concrete in compacted layers not exceeding 55mm to thickness, lines and grades indicated on drawings.

.5 Minimum 120 degrees C (248 degrees F) temperature required when spreading.

.6 Maximum 160 degrees C (320 degrees F) temperature permitted at any time.

.7 Compact each course with roller as soon as it can support roller weight without undue cracking or displacement.

.8 Overlap successive passes of roller by at least one half width of roller and vary pass lengths.

.9 Roll until roller marks are eliminated. Compact to 92.0 to 96.5 % of the Maximum Relative Density.

.10 Keep roller speed slow enough to avoid mix displacement ands do not stop roller on fresh pavement.

.11 Moisten roller wheels with water to prevent mix adhesion but do not overwater.

.12 Where rolling causes displacement of material, loosen affected areas at once with lutes of shovels and restore to original grade of loose material before rerolling.

.13 Carry out compaction in three operations in close sequence:

.1 "Breakdown" rolling with two wheeled rollers as soon as possible after spreading.

.2 Rolling with pneumatic tired or tandem rollers immediately after the first rolling to achieve the minimum specified density.

.3 Final rolling with two or three axle tandem rollers to remove roller marks.

.4 Compact mix with hot tampers or other equipment approved by the City in areas inaccessible to rollers.

3.6 Joints

.1 Cut bituminous course to full depth, unless otherwise noted, in neat lines to expose fresh vertical surfaces. Remove broken and loose material.

.2 Paint exposed vertical edge of asphaltic joints, edges of manholes and catch basin frames, curbs and similar items with hot asphalt cement of emulsified asphalt prime prior to placing asphalt courses.

.3 Where paving comprises two courses, overlap longitudinal joints minimum 150mm.

.4 Carefully place and compact hot asphaltic material against joints.

.5 Cold plane all asphalt joints to width of 750mm and depth of 40mm.

3.7 Pavement Construction

.1 Application of prime coat: OPSS302.

.2 Construction of asphalt concrete: OPSS310.07.

3.8 Finish Tolerances

.1 Upon completion of compaction each pavement course shall be:

.1 Smooth and true to crown and grade with variation not more than 3 mm from thickness shown on Drawing. Do not place any asphaltic course less than 25 mm thick or more than 75 mm thick.

.2 Finished asphalt surface to be within 10 mm of design elevation but not uniformly high or low, and with no irregularities greater than 10 mm in 4.5m.

.3 Compacted to a density not less than 98% of density of laboratory compacted mixture.

3.9 Defective Work

.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 specified density.

.2 Repair areas showing checking or rippling.

.3 Adjust roller operation and screed settings on paver to prevent further defects such as rippling and checking of pavement.

END OF SECTION

PART 1 - **GENERAL**

1.1 References

.1 American Society for Testing and Materials (ASTM).

.1 ASTM C 136-96a, Method for Sieve Analysis of Fine and Coarse Aggregates.

.2 ASTM C 117-95, Test Method for Material Finer Than 0.075 mm (No. 200) Sieve in Mineral Aggregates by Washing.

.3 ASTM E 11-95, Specification for Wire - Cloth Sieves for Testing Purposes.

.4 ASTM D 4318-98, Test Method for Liquid Limit, Plastic Limit and Plasticity Index of Soils.

.5 ASTM D 698-91, Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures, Using 2.49-kg Rammer and 304.8-mm Drop.

.2 Canadian General Standards Board (CGSB)

.1 CAN/CGSB-8.1-88, Sieves, Testing, Woven Wire, Inch Series.

.2 CAN/CGSB-8.2-M88, Sieves, Testing, Woven Wire, Metric.

.3 Ontario Provincial Standard Specifications and Drawings (OPSS, OPSD).

.1 OPSS 1010.

1.2 Protection

.1 Prevent damage to existing vegetation, concrete sidewalks, water courses, wetlands, fences, railings and adjacent property. Make good any damage.

1.3 Delivery, Storage and Handling

.1 Do not store materials within Limit of Work. A limited amount of material may be stored in a pre-determined holding area. Material shall be contained to ensure that the material does not come in contact with the ground or water outside the pre-determined holding area.

PART 2 - **PRODUCTS**

2.1 Materials

.1 Granular Sub-Base

.1 Granular B “1” per OPSS 1010.

.2 Clean, hard, durable sand, gravel or crushed stone, free from shale, clay, friable materials, organic matter and other deleterious substances and graded within the following limits when tested and giving a smooth curve without sharp breaks when plotting a semi-log grading chart.

.3 Table:

Sieve Designation	% Passing
150 mm	100
26.5 mm	50-100
4.75 mm	20-100

1.18 mm	10-100
0.300 mm	2-65
0.075 mm	0-8

.2 Granular Base

.1 Granular 'A' per OPSS 1010.

.2 Clean, hard, durable sand, gravel or crushed stone, free from shale, clay, friable materials, organic matter and other deleterious substances and graded within the following limits when tested and giving a smooth curve without sharp breaks when plotting a semi-log grading chart:

.3 Table:

Sieve Designation	% Passing
26.5 mm	100
19.0 mm	85-100
13.2 mm	65-90
9.5 mm	50-73
4.75 mm	35-55
1.18 mm	15-40
0.300 mm	5-22
0.075 mm	2-8

.3 Stone Dust Surfacing:

.1 Screenings: hard, durable, crushed stone particles, free from clay lumps, cementation, organic material, frozen material and other deleterious materials.

.2 Gradations: within limits specified when tested to ASTM C 136 and ASTM C 117.

Sieve Designation	% Passing
9.5 mm	100
4.75 mm	50-100
2.00 mm	30-65
0.425 mm	10-30
0.075 mm	5-10

PART 3 - **EXECUTION**

3.1 Subgrade

.1 Ensure that subgrade preparation conforms to levels and compaction required to allow for installation of granular base.

3.2 Granular Base

.1 Granular base material minimum thickness: as indicated on Drawings.

.2 Spread and compact granular base material in uniform layers not exceeding 100 mm compacted thickness.

.3 Compact to a density of not less than 100 % Standard Proctor Maximum Dry Density in accordance with ASTM D 698.

3.3 Stone Dust Surfacing

.1 Place stone dust surfacing to compacted thickness as indicated in Drawings.

.2 Compact to a density of not less than 98% Standard Density in accordance with ASTM D 698.

END OF SECTION

PART 1 - GENERAL

1.1 Submittals

.1 Samples:

.1 Provide sample on site that shows full range of sizes specified.

PART 2 - PRODUCTS

2.1 Stone

.1 Hard, dense with relative density (formally specific gravity) not less than 2.65, durable quarry stone, free from seams, cracks or other structural defects, to meet following size distribution for use intended:

.1 Random rip-rap:

.1 Not more than 10% of total volume of stones with individual volume less than 15 dm^3.

.2 Not less than 50% of total volume of stones with individual volume of 85 dm^3 or more.

.3 Remaining percentage of total volume to have uniform distribution of stones between 15 and 85 dm^3 size.

2.2 Filter Cloth

.1 Geotextile: in accordance with Section 02498.

PART 3 - EXECUTION

3.1 Placing

.1 Fine grade area to be rip-rapped to uniform, even surface. Fill depressions with suitable material and compact to provide firm bed.

.2 Place geotextile on prepared surface in accordance with Section 02498 - Geotextiles and as indicated. Avoid puncturing geotextile. Vehicular traffic over geotextile not permitted.

.3 Place rip-rap to thickness and details as indicated on drawings.

.4 Place stones in manner approved by City's Representative to secure surface and create a stable mass. Place larger stones at bottom of slopes.

.5 Hand placing:

.1 Use larger stones for lower courses and as headers for subsequent courses.

.2 Stagger vertical joints and fill voids with rock spalls or cobbles.

.3 Finish surface evenly, free of large openings and neat in appearance.

END OF SECTION

PART 1 GENERAL

1.1 Related Sections

.1 Section 02520 - Crushed Stone Surfacing.

.2 Section 02743 - Asphalt Paving.

.3 Section 03302 - Cast-in-Place Concrete.

1.2 References

.1 Canadian Standards Association (CSA).

.1 Current CAN/CSA-A23.1, Concrete Materials and Methods of Concrete Construction.

.2 American Society for Testing and Materials (ASTM).

.1 Current ASTMD698, Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400ft-lbf/ft^3) (600kN-m/m^3).

PART 2 PRODUCTS

2.1 Materials

.1 Concrete paving work materials to conform to applicable detail on drawings.

.2 Concrete mixes and materials, reinforcing steel, joint filler and curing compound as per Section 03302 - Cast-in-Place Concrete

.3 Granular base: to OPSS 1010.

.4 Non-staining mineral type form release agent: chemically active release agents containing compounds that react with free lime to provide water soluble soap.

PART 3 EXECUTION

3.1 Grade Preparation

.1 Complete preparation work in accordance with Section 02210 - Rough Grading.

3.2 Granular Base

.1 Obtain the City's Representative's approval of subgrade before placing granular base.

.2 Place granular base material to lines, widths, and depths as indicated.

.3 Compact granular base to at least 98% of maximum density to ASTMD698.

3.3 Concrete

.1 Complete concrete work in accordance with Section 03302 - Cast-in-Place Concrete - Short Form.

.2 Obtain the City's approval of granular base prior to placing concrete.

.3 Immediately after floating, give sidewalk surface uniform broom finish to produce regular corrugations not exceeding 2mm deep.

.4 Provide edging with 10mm radius edging tool.

.5 Slip-form pavers equipped with string line system for line and grade control may be used if quality of work acceptable to the City can be demonstrated.

.6 Hand finish surfaces when directed by the City.

3.4 Tolerances

.1 Finish surfaces to within 3mm in 3m as measured with 3m straightedge placed on surface.

3.5 Expansion and Contraction Joints

.1 Install tooled transverse contraction joints after floating, when concrete is stiff, but still plastic as per applicable detail.

.2 Install expansion joints as per applicable detail.

.3 Install expansion joints around manholes and catch basins and along length adjacent to concrete curbs, catch basins, buildings, or permanent structure.

.4 When sidewalk is adjacent to curb, make joints of curb, gutters and sidewalk coincide.

.5 Install joint filler in expansion joints as per applicable detail.

.6 Seal expansion joints with sealant as per applicable detail.

3.6 Curing

.1 Cure concrete by adding moisture continuously in accordance with CAN/CSA-A23.1 to exposed finished surfaces for at least 1 day after placing, or sealing moisture in by curing compound approved by the City.

.2 Where burlap is used for moist curing, place two pre-wetted layers on concrete surface and keep continuously wet during curing period.

.3 Apply curing compound evenly to form continuous film. In accordance with manufacturer's requirements.

3.7 Backfill

.1 Allow concrete to cure for 7 days prior to backfilling.

.2 Backfill to designated elevations with adjacent material as detailed. Compact and shape to required contours as indicated on drawings.

END OF SECTION

PART 1 - GENERAL

1.1 Product Data

.1 Submit product data. Indicate dimensions, sizes, assembly, anchorage and installation details for each accessory specified.

1.2 Maintenance Data

.1 Provide maintenance data for care and cleaning of site accessories.

1.3 Scheduling

.1 Schedule installation of exterior accessories with cast-in-place concrete paving work.

PART 2 - PRODUCTS

2.1 Garbage Receptacle

.1 Manufacturer: Maglin Site Furniture.
Model: MLWR250-32.
Colour: Black.
Each unit to be surface mounted on concrete paving in locations indicated on drawings.
Coordinate installation with cast-in-place concrete installation.

Supplier: Maglin Site Furniture, Brantford, ON. Phone: 1 877 260 9393.
www.maglin.com

.2 Quantity: 1.

2.2 Bench

.1 Manufacturer: Paris Equipment Manufacturing Ltd.
Model: Premier Serenity Series – PS6.
Colour: Black.
Each unit to be surface mounted on concrete paving in locations indicated on drawings.
Coordinate installation with cast-in-place concrete installation.

Supplier: Paris Equipment Manufacturing Ltd. Phone: 1 800 387 6318.
www.peml.com

.2 Quantity: 1.

2.3 Trail Signs

.1. Trail Information Sign:

.1. Model: F80 Freestanding.

.2. Manufacturer / Supplier: Fontasy Sign and Display Inc.
www.fontasy.ca
Ph: 905 640 8300
Contact: Richard Knobbs
Richard@fontasy.ca

.3. Footing: Use Fontasy Ground Key per details.

.4. Quantity: 4.

.2. Trail Key Sign:

.1. Model: Trail Key System.

.2. Manufacturer / Supplier: Fontasy Sign and Display Inc.
www.fontasy.ca
Ph: 905 640 8300
Contact: Richard Knobbs
Richard@fontasy.ca

.3. Footing: Use Fontasy Ground Key per details.

.4. Quantity: 8.

2.4 Trekfit Equipment (Provisional)

.1. Trekfit System including:.
.1. Long Bench. Quantity: 1.
.2. Parallel Bar. Quantity: 1.
.3. Push-up Bar Triple. Quantity: 1.
.4. Pull-up Bar Triple. Quantity: 1.
.5. Vault bar. Quantity: 3.
.6. Trekfit Sign. Quantity: 13.

.2. Bench per 2.2 of this Section. Quantity: 6.

.3. Manufacturer / Supplier: Trekfit, 4200 Saint-Laurent, Suite 504, Montreal, QC.
www.trekfit.ca
Ph: 877 280 8884
Contact: Eric Tomeo

PART 3 - EXECUTION

3.1 Installation

.1 Install in locations indicated on drawings.

.2 Assemble accessories in accordance with manufacturer's instructions.

.3 Install Install accessory true, plumb, anchored, and firmly supported, as indicated on drawings and in details.

.4 Touch-up damaged finishes to approval of City's Representative.

END OF SECTION

PART 1 - GENERAL

1.1 Related Sections

.1 Section 02516 – Asphalt Concrete Paving

.2 Section 02520 – Crushed Stone Surfacing

1.2 References

.1 American Society for Testing and Materials International, (ASTM)

.1 ASTM D1248-02, Standard Specification for Polyethylene Plastics Extrusion Materials For Wire and Cable.

.2 ASTM D4101-02a, Standard Specification for Polypropylene Injection and Extrusion Materials.

.3 ASTM D4218-96 (R2001), Standard Test Method for Determination of Carbon Black Content in Polyethylene Compounds By the Muffle-Furnace Technique.

.4 ASTM D5262-97, Standard Test Method for Evaluating the Unconfined Tension Creep Behaviour of Geosynthetics.

.5 ASTM D6637-01, Standard Test Method for Determining Tensile Properties of Geogrids by the Single or Multi-Rib Tensile Method.

.2 Drexel University - Geosynthetic Research Institute (GRI)

.1 GRI GG2-87 R2000, Geogrid Junction Strength.

1.3 Submittals

.1 Submit samples in accordance with Section 01330 - Submittal Procedures.

.2 Submit to City's Representative following samples at least 2 weeks prior to beginning Work.

.1 One 1 m length from full roll width of geogrid material.

.3 Submit to City's Representative copies of mill test data and certificate, at least 2 weeks prior to start of Work and in accordance with Section 01330 - Submittal Procedures.

1.4 Delivery,Storage and Handling

.1 During delivery and storage, protect geogrids from direct sunlight, ultraviolet rays, excessive heat, mud, dirt, dust, debris and rodents.

1.5 Waste Management Disposal

.1 Remove from site and dispose of all packaging materials at appropriate recycling facilities.

PART 2 - PRODUCTS

2.1 Material

.1 Geogrid: open grid polymer having biaxial orientation, free of striations, roughness, pinholes, blisters, undispersed raw materials or any sign of contamination by foreign matter.

.1 Roll width: 4 m minimum.

.2 Roll length: 75 m minimum.

.3 Rib thickness: 0.8 mm minimum.

.4 Junction thickness: 4.1 mm minimum.

.5 Aperture size:

.1 Machine direction: 39 mm.

.2 Cross machine direction: 39 mm.

.6 Polymer: polypropylene: to ASTM D4101 with inhibitors added to resist deterioration by ultra-violet and heat exposure.

.2 Geogrid physical properties:

.1 Peak tensile strength: to ASTM D6637.

.2 Tensile secant modulus at 2% elongation: to ASTM D6637.

.3 Tensile creep strength: to ASTM D5262.

.4 Rigid geogrid junction strength and efficiency: to GRI GG2.

.1 Efficiency: minimum 95 %.

.5 Carbon black content: to ASTM D4218, minimum 2%.

PART 3 - EXECUTION

3.1 Installation

.1 Place geogrid material by unrolling onto graded surface in manner and locations indicated and retain in position in accordance with manufacturer's written recommendations.

.2 Place geogrid on sloping surfaces in one continuous length from toe of slope to upper extent of geogrid.

.3 Overlap each successive strip of geogrid 600 mm over previously laid strip.

.4 Join successive strips of geogrid as recommended by manufacturer.

.5 Protect geogrid from displacement, damage or deterioration before and during placement of overlay material layers.

.6 After installation, cover with overlay layer within 1 day of placement.

.7 Replace damaged or deteriorated geogrid to approval of City's Representative.

.8 Place and compact material layers in accordance with appropriate Sections.

3.2 Cleaning

.1 Remove construction debris from project site and dispose of debris in an environmentally responsible and legal manner.

3.3 Protection

.1 Vehicular traffic not permitted directly on geogrid.

END OF SECTION

PART 1 GENERAL

1.1 References

.1 Canadian Standards Association (CSA International).

.1 CSA G30.5-[M1983(R1998)], Welded Steel Wire Fabric for Concrete Reinforcement.

.2 Department of Justice Canada (Jus).

.1 Canadian Environmental Protection Act (CEPA), 1999, c. 33.
.2 Fertilizers Act (R.S. 1985, c. F-10).
.3 Fertilizers Regulations (C.R.C., c. 666).
.4 Transportation of Dangerous Goods Act (TDGA), 1992, c. 34.

.3 Health Canada - Pest Management Regulatory Agency (PMRA).

.1 National Standard for Pesticide Education, Training and Certification in Canada (1995).

.4 Health Canada/Workplace Hazardous Materials Information System (WHMIS).

.1 Material Safety Data Sheets (MSDS).

1.2 Definition

.1 Mycorrhiza : association between fungus and roots of plants. This symbiosis, enhances plant establishment in newly landscaped and imported soils.

1.3 Submittals

.1 Make submittals in accordance with Section 01330 - Submittal Procedures.

.2 Submit monthly written reports on maintenance during warranty period, to City's Representative identifying:

.1 Maintenance work carried out.
.2 Development and condition of plant material.
.3 Preventative or corrective measures required which are outside Contractor's responsibility.

.3 Submit WHMIS MSDS in accordance with Section 01357 - Hazardous Materials.

1.4 Quality Assurance

.1 Health and Safety:

.1 Do construction occupational health and safety in accordance with Section 01353 - Health and Safety Requirements.

1.5 Scheduling

.1 Obtain approval from City's Representative of schedule indicating beginning of Work.

1.6 Maintenance during Warranty Period

.1 From time of acceptance by City's Representative to end of warranty period, perform following maintenance operations.

.1 Water to maintain soil moisture conditions for optimum growth and health of plant material without causing erosion.

.2 Apply pesticides in accordance with National Standard for Pesticide Education, Training and Certification in Canada, Federal, Provincial and Municipal regulations as and when required to control insects, fungus and disease. Obtain product approval from City Representative prior to application.

.3 Apply fertilizer in early spring at manufacturer's suggested rate.

.4 Remove dead, broken or hazardous branches from plant material. Dispose of debris from site.

PART 2 PRODUCTS

2.1 Materials

.1 Fill:

.1 Type (A): clean, natural river sand and gravel material, free from silt, clay, loam, friable or soluble materials and organic matter.

.2 Type (B): soil, free from roots, rocks larger than 75 mm, building debris, and toxic ingredients (salt, oil, etc).

.2 Coarse washed stones: 35-75 mm diameter.

.3 Peatmoss:

.1 Derived from partially decomposed species of Sphagnum Mosses.

.2 Elastic and homogeneous.

.3 Free of wood and deleterious material which could prohibit growth.

.4 Shredded minimum particle size: 5 mm.

.4 Fertilizer:

.1 To Canada Fertilizer Act and Fertilizers Regulations.

.2 Complete, commercial, slow release with 35 % of nitrogen content in water-insoluble form.

.5 Anti-desiccant: commercial, wax-like emulsion.

.6 Filter Cloth:

.1 Type 1: 100 % non-woven needle punched polyester, 2.75 mm thick, 240 g/m2 mass.

.2 Type 2: biodegradable burlap.

.7 Wood posts: 38 x 89 x 2400 mm length.

.8 Welded wire fabric (WWF): 100 x 100 mm, to CSA G30.5.

.9 Mycorrhyzal fungi inoculants: per Section 02950 – Planting.

PART 3 EXECUTION

3.1 Identification and Protection

.1 Do construction occupational health and safety in accordance with Section 01353- Health and Safety Requirements.

.2 Identify plants and limits of root systems to be preserved as approved by City’s Representative.

.3 Protect plant and root systems from damage, compaction and contamination resulting from construction as approved by City's Representative.

.4 Ensure no pruning is done inside drip line. If pruning inside drip line is required consult an arborist or Canadian Certified Horticultural Technician (CCHT) as approved by City's Representative.

3.2 Root Curtain System

.1 Identify limits for required construction excavation as approved by City's Representative.

.2 Prior to construction excavation, hand dig trench minimum 500 mm wide x 1500 mm deep, along perimeter of excavation limits.

.3 Prune exposed roots cleanly at side of trench nearest plants to be preserved. Pruned ends to point obliquely downwards.

.4 Install wooden posts and welded wire fabric against construction edge of trench.

.5 Securely attach Type 2 filter fabric on plant side of wire mesh.

.6 Prepare homogeneous mixture of fertilizer, parent material and organic matter.

.1 Add organic matter to mixture to achieve 7-9% organic matter content by weight.

.2 Incorporate with mixture grade 2:12:8 ratio fertilizer (dry) at rate of 1.5 kg/m^3.

.7 Backfill with homogeneous mixture between curtain wall and plants to be preserved in layers not exceeding 150 mm in depth. Compact each layer to85% Standard Proctor Density.

.8 Protect root curtain from damage during construction operations.

.9 Water plants and root curtain sufficiently during construction to maintain optimum soil moisture condition until backfill operations are complete.

.10 Remove root curtain before backfill operations. Ensure root curtain is cut down to 300 mm below finished grade and remove cut material.

3.3 Air Layering System

.1 Using manual methods, carefully remove turf, plants, leaves and organic matter in area of root system, dispose of plant off site, and slightly loosen topsoil surface. Avoid damage to root system.

.2 Lay horizontal system of perforated, recycled content drain pipe on surface of existing grade.

.1 Slope drain tile minimum 3% for drainage away from trunk of tree.

.2 Connect system with general site drainage system or drain to low point on site.

.3 Install recycled content plastic "vent" pipes vertically over joints in horizontal pipe system or where indicated. Top of vent pipe to be 20 mm above finished grade of fill. Keep top of vent pipe covered during construction. Cover joints with filter fabric and place coarse washed stone around joints and vertical pipes to secure their position.

.4 Construct drywell around trunk of tree.

.1 Ensure open ends of horizontal or vertical pipe systems are left exposed for air circulation to root system.

.2 Protect openings from blockage during construction.

.3 Install protective caps on exposed horizontal openings.

.5 Place 200 mm depth of coarse washed stone on surface of original ground and horizontal pipe system to limits.

.6 Place filter fabric over surface of granular layer.

.7 Place Type A fill over filter fabric to required depth without disturbing or damaging drain pipe system. Avoid damage to filter fabric.

.8 Complete topsoil and finished surface treatments over area of sub-surface system within 1 week of placing fill.

.9 Remove temporary protective covering from vent pipe openings. Install protective caps flush with finished grade.

3.4 Lowering grade around existing tree

.1 Begin Work in accordance with schedule approved by City's Representative.

.2 Cut slope not less than 500 mm from tree trunk to new grade level.

.3 Excavate to depths as indicated. Protect from damage root zone which is to remain.

.4 When severing roots at excavation level, cut roots with sharp tools.

.5 Cultivate excavated surface manually to 15 mm depth.

.6 Prepare homogeneous soil mixture consisting by volume of:

.1 60 % excavated soil cleaned of roots, plant matter, stones, debris.
.2 25 % coarse, clean sterile sand.
.3 15 % organic matter.
.4 Grade 2:12:8 fertilizer at rate of 1.5 kg/m^3.

.7 Place soil mixture over area of excavation to finished grade level. Compact to 85% Standard Proctor Density.

.8 Water entire root zone to optimum soil moisture level.

.9 Complete topsoil and finished surface treatments

3.5 Pruning

.1 Prune in accordance with Section 02320 - Tree Pruning.

3.6 Anti-dessicant

.1 Apply anti-desiccant to foliage where applicable and as directed by City's Representative.

END OF SECTION

PART 1 GENERAL

1.1 Related Work

.1 Section 02921 Topsoil and Finish Grading

.2 Section 02938 Sodding

1.2 Scheduling

.1 Seed between August 25 and September 30 prior to frost or as approved by the City Representative, and after weed killing has been approved by the City's Representative.

PART 2 PRODUCTS

2.1 Seed

.1 Canada 'Certified' seed, in accordance with Government of Canada 'Seeds Act' and 'Seeds Regulations'.

.2 In packages individually labelled in accordance with 'Seeds Regulations' and indicating name of supplier, seed mix content, germination rate, and date bagged.

.3 Seed Mix:
40% Lolium perenne
20% Festuca arundinacea
20% Poa compressa
20% Agrostis stolonifera

Seed at rate of 6 lbs. /1000 square feet.

2.2 Water

.1 2.2.1 Potable, supplied on site.

2.3 Fertilizer

.1 To Canada 'Fertilizers Act' and 'Fertilizers Regulations'.

.2 Complete synthetic, 20-20-20 slow release with minimum 50% of nitrogen content in ureaformaldehyde form to be used unless otherwise directed by City's Representative.

2.4 Mulch

.1 Specially manufactured for use in hydraulic seeding equipment, non-toxic, water activated, green colouring, free of germination and growth inhibiting factors with the following properties:

.1 Type I Mulch:

.1 Made from wood cellulose fibre.
.2 Organic matter content: 95% plus or minus 0.5%.
.3 Value of pH: 6.0.
.4 Potential water absorption: 800-900%.

.2 Type II Mulch:

.1 Made from newsprint, raw cotton fibre and straw, processed to produce fibre lengths of 15 mm minimum and 25 mm maximum. Greater proportions of ingredients to be straw.

.3 Type "C" Mulch:

.1 Made from a combination of Type I and Type II mulch per Ministry of Transportation Ontario standards.

PART 3 EXECUTION

3.1 Workmanship

.1 Do not perform work under adverse field conditions such as frozen soil, excessively wet or dry soil or soil covered with snow, ice or standing water.

.2 Do not spray onto structures, signs, guardrails, fences, plant material, utilities and other structures intended.

.3 Clean up immediately any material sprayed where not intended, to satisfaction of Landscape Architect.

3.2 Seed Bed Preparation

.1 Verify that grades are correct per Section 02921 - Topsoil and Finish Grading.

.2 Remove dead vegetation prior to seeding.

.3 Finish grade to be free of humps and hollows and free of deleterious materials.

.4 Ensure areas to seeded are moist to depth of 100 mm before seeding.

.5 Lightly cultivate area to 25 mm depth immediately prior to seeding.

3.3 Fertilizing Program

.1 Fertilize at time of seeding at a rate of 0.5 kg per 100 sq m of seeded area.

.2 Spread half of required amount of fertilizer in one direction and remainder at right angles and water in well.

.3 Refer to section 3.5 of this specification for additional fertilizer applications.

3.4 Preparation of Slurry

.1 Measure quantities of materials by weight or weight-calibrated volume measurement.

.2 Charge required water into seeder. Add material into hydraulic seeder under agitation. Pulverize mulch and charge slowly into seeder.

.3 After all material is in seeder, mix thoroughly to complete slurry.

3.5 Slurry Application

.1 Hydraulic Seeding Equipment:

.1 Slurry tank: minimum 4500L.

.2 Agitation system for slurry to be capable of operating during charging of tank and during seeding, consisting of recirculation of slurry and mechanical agitation method.

.3 Pumps capable of maintaining continuous non-fluctuating flow of solution.

.4 Supplied with not less than 6 spray pattern nozzles.

.5 Capable of seeding by 50 m hand operated hoses and appropriate nozzles.

.6 Tank volume to be certified by certifying authority and identified by authority's "Volume Certification Plate".

.2 Slurry mixture applied PER HECTARE:

.1 Seed mixture: 300 kg (6 lbs./1000 sq. ft.).

.2 Mulch: Type I or Type II 1530 kg (125 lbs / 4000 sq. ft.).

.3 Water: minimum 30000L.

.3 Apply slurry uniformly, at optimum angle of application for adherence to surfaces and germination of seed.

.1 Use correct nozzle for application.

.2 Using hoses for surfaces difficult to reach and to control application.

.3 Blend application 300 mm into adjacent grass areas or sodded areas to form uniform surfaces.

.4 Re-apply where application is not uniform.

.5 Remove slurry from items and areas not designated to be sprayed.

.6 Protect seeded areas from trespass.

.7 Remove protection devices.

3.6 Maintenance During Establishment Period

.1 Perform the following operations from time of seeding to time of acceptance:

.1 Water seeded area to maintain optimum soil moisture level for germination and continued growth of grass. Control watering to avoid washouts.

.2 Repair and reseed dead or bare spots to allow establishment of seed prior to acceptance.

.3 Fertilize a minimum of two applications. Additional fertilizer applications may be required to meet acceptance conditions (3.6) to develop and maintain a healthy stand of grass plants. Use ratio appropriate to season and conditions. Allow minimum one month between applications.

.4 3.6.1.4 Seeded areas are weed free.

3.7 Acceptance

.1 Seeded areas will be accepted by the City's Representative provided that:

.1 Areas are uniformly established without eroded, bare, thin or dead spots.

.2 Turfgrass is healthy, dense, well-rooted, of good colour and in a vigorous growing condition.

.3 Areas seeded in fall will be accepted in following spring, no sooner than one month after start of growing season provided acceptance conditions are fulfilled.

3.8 Guarantee

.1 Seeded areas shall be guaranteed for 2 years after acceptance.

.2 Only seed which is rooted in place and exhibiting vigorous healthy growth at the time of inspection will be deemed to have met the terms of the guarantee.

.3 Seeded areas which show deterioration, bare spots, or failure to take root and thrive, shall be re-seeded and maintained for an additional 30 days according to all the requirements as described in this section.

END OF SECTION

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PART 1 GENERAL

1.1 Related Sections

.1 Section 02921 - Topsoil and Finish Grading

.2 Section 02933 Hydraulic Seeding

1.2 Quality Assurance

.1 Certificates: product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.

1.3 Scheduling

.1 Schedule sod laying to coincide with preparation of soil surface.

.2 Schedule sod installation after planting.

.3 Schedule sod installation when frost is not present in ground.

.4 Coordinate sod laying with work of other trades.

1.4 Waste Management and Disposal

.1 Divert unused fertilizer from landfill to official hazardous material collections site.

.2 Do not dispose of unused fertilizer into sewer systems, into lakes, streams, onto ground or in locations where it will pose health or environmental hazard.

PART 2 PRODUCTS

2.1 Materials

.1 Number One Turf Grass Nursery Sod: sod that has been especially sown and cultivated in nursery fields as turf grass crop.

.1 Sod types:

.1 Number One Kentucky Bluegrass Sod - Fescue Sod: Nursery Sod grown solely from seed mixture of cultivars of Kentucky Bluegrass and Chewing Fescue or Creeping Red Fescue, containing not less than 40% Kentucky Bluegrass cultivars and 30% Chewing Fescue cultivars.

.2 Sod quality:

.1 Not more than 2 broadleaf weeds or 10 other weeds per 40 square metres.

.2 Density of sod sufficient so that no soil is visible from height of 1500 mm when mown to height of 50 mm.

.3 Mowing height limit: 35 to 65 mm.

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.4 Soil portion of sod: 15 mm to minimum 6 mm in thickness.

.2 Sod establishment support:

.1 Wooden pegs: 17 x 8 x 250 mm.

.2 Biodegradable starch pegs: 17 x 8 x 250 mm.

.3 Water:

.1 Potable, supplied on site.

.4 Fertilizer:

.1 To Canada "Fertilizers Act" and "Fertilizers Regulations".

.2 Complete, synthetic, 5-20-20 slow release with 65 % of nitrogen content in water-insoluble form.

2.2 Source Quality Control

.1 Obtain approval from Consultant of sod at source.

.2 When proposed source of sod is approved, use no other source without written authorization from Consultant.

PART 3 EXECUTION

3.1 Preparation

.1 Verify that grades are correct and prepared in accordance with Section 32 91 21 - Topsoil Placement and Grading. If discrepancies occur, notify Consulting Engineer and Landscape Architect and do not commence work until instructed.

.2 Do not perform work under adverse field conditions such as frozen soil, excessively wet soil or soil covered with snow, ice, or standing water.

.3 Fine grade surface free of humps and hollows to smooth, even grade, to contours and elevations indicated, to tolerance of 15mm, surface to drain naturally.

.4 Remove and dispose of weeds; debris; stones 50mm in diameter and larger; soil contaminated by oil, gasoline and other deleterious materials; off site.

3.2 Sod Placement

.1 Lay sod within 36 hours of being lifted if air temperature exceeds 20 degrees C.

.2 Lay sod sections in rows, joints staggered. Butt sections closely without overlapping or leaving gaps between sections. Cut out irregular or thin sections with sharp implements.

.3 Provide close contact between sod and soil by light rolling. Use of heavy roller to correct irregularities in grade is not permitted.

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3.3 Sod Placement on Slopes and Pegging

.1 Start laying sod at bottom of slopes.

.2 Peg sod on slopes steeper than 3 horizontal to 1 vertical, within 1 m of catch basins and within 1 m of drainage channels and ditches to following pattern:

- .1 100 mm below top edge at 300 mm on centre for first sod sections along contours of slopes.
- .2 Not less than 3 pegs per square metre.
- .3 Not less than 6 pegs per square metre in drainage structures. Adjust pattern as directed by Consultant.
- .4 Drive pegs to 20 mm above soil surface of sod sections.

3.4 Fertilizing Program

.1 Fertilize at time of installation at a rate of 0.5 kg per 100 sq m of sodded area.

.2 Spread half of required amount of fertilizer in one direction and remainder at right angles and water in well.

.3 One additional fertilizer application will be required. Timing will be dependant on weather and turf conditions but should occur once sod is established.

.4 Additional fertilizer applications may be required to properly establish turf. This is to be determined by Consultant.

3.5 Maintenance Prior to Acceptance

.1 Perform following operations from time of installation until acceptance.

.2 Water sodded areas in sufficient quantities and at frequency required to maintain optimum soil moisture condition to depth of 75 to 100 mm.

.3 Cut grass to 65 mm when or prior to it reaching height of 90 mm. Remove clippings which will smother grassed areas. A minimum of two mowings are required.

.4 Maintain sodded areas weed free.

.5 Check the site for broken branches, leaves, paper and similar material to keep the area reasonably clean at all times. Remove all extraneous material from the site. No material shall be burned on the site. Paved areas and lawns shall be kept clean at all times.

.6 Damage resulting from erosion, washout, or any other cause shall be repaired immediately by the Contractor at no additional cost to the Owner.

.7 Grass areas which show deterioration or bare spots shall be re-sodded within the maintenance period so that at no time does the grass show signs of wear.

.8 Fertilize areas in accordance with fertilizing program. Spread half of required amount of fertilizer in one direction and remainder at right angles and water in well.

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3.6 Acceptance

.1 Sod areas will be accepted by Consultant provided that:

- .1 Sodded areas are properly established.
- .2 Sod is free of bare and dead spots.
- .3 No surface soil is visible from height of 1500 mm when grass has been cut to height of 50 mm.
- .4 Sodded areas have been cut minimum 1 times prior to acceptance.
- .5 Sodded areas have been cut within 24 h prior to acceptance.
- .6 Sodded areas have been fertilized.

.2 Areas sodded in fall will be accepted in following spring one month after start of growing season provided acceptance conditions are fulfilled.

3.7 Warranty

.1 Sodding shall be guaranteed for 2 years after acceptance.

.2 Only sod which is rooted in place and exhibiting vigorous healthy growth at the time of inspection will be deemed to have met the terms of the guarantee.

.3 Sod areas which show deterioration, bare spots, or failure to take root and thrive, shall be re-sodded and maintained for an additional 30 days according to all the requirements as described in this section.

3.8 Maintenance During Warranty Period

.1 Perform following operations from time of acceptance until end of warranty period:

- .1 Water sodded areas at sufficient quantities and at frequency required to obtain optimum soil moisture conditions to depth of 100 mm
- .2 Cut grass to 40 mm when it reaches height of 60 mm. Remove clippings that will smother grassed areas
- .3 Repair and re-sod dead or bare spots to satisfaction of Consultant.
- .4 Fertilize areas in accordance with fertilizing program. Check the site for broken branches, leaves, paper and similar material to keep the area reasonably clean at all times. Remove all extraneous material from the site. Paved areas and lawns shall be kept clean at all times.
- .5 Damage resulting from erosion, washout, or any other cause shall be repaired immediately by the Contractor at no additional cost to the Owner.

3.9 Cleaning

.1 Upon completion of installation, remove surplus materials, rubbish, tools and equipment barriers.

END OF SECTION

PART 1 GENERAL

1.1 Related Work

.1 Section 02935 – Hydraulic Seeding

1.2 Coordination

.1 All work of this Specification to be coordinated with work of other Contractors.

.2 Contractor to comply with all traffic control procedures of City of Guelph.

.3 Contractor responsible to obtain utility locates prior to commencement of work.

1.3 Material, Submission & Design Requirements

.1 All trees, shrubs and ground cover planting works shall be in accordance with the Canadian Nursery Landscape Association's: "Canadian Standards for Nursery Stock", latest edition.

.2 Supply plant materials as specified on the contract drawings. Substitutions with other species or cultivars will be accepted only with the written approval of the City's Representative.

.3 The Contractor shall prepare the final list of available plant materials and submit the list for review by the Landscape Architect prior to ordering the materials.

.4 The Contractor shall provide a planting schedule to the City's Representative for approval, prior to initiating planting works.

1.4 Definitions

.1 Mycorrhizal inoculant: fungi-based soil inoculants. Endomycorrhizal and ectomycorrhizal inoculant that contains several species of fungi which are compatible with deciduous trees, as well as some coniferous trees, shrubs and herbaceous plants.

PART 2 PRODUCTS

2.1 Plant Material

.1 All plant material must be nursery grown and meet the specifications set out in the latest Guide Specifications for Nursery Stock prepared by the Canadian Nursery Landscape Association for size, height, calliper, spread, grading, quality and method of cultivation.

.2 Nomenclature of specified plants shall conform to the International Code of Nomenclature for Cultivated Plants and the latest edition of Standardized Plant Names.

.3 Any plant material not conforming to the above standards will be designated as collected plants and will be rejected.

.4 All plant materials shall be true to name and type, structurally sound, well branched; healthy and vigorous and free from disease, insect infestations, rodent damage, sun scald, frost cracks, and other abrasions to the bark and densely foliated with a healthy, well developed root system. Pruning wounds must show vigorous bark on all edges and all parts must show live and green cambium tissue when cut.

.5 All plant material must conform to the sizes shown on the plant list, except that larger material may be used when approved by the City's Representative. Use of larger plants will not increase the contract price.

.6 All plant material shall be grown in climate and soil conditions similar to those of the installation site.

2.2 Other Materials

.1 Anchor stakes: Iron T-bar 40 x 40 x2440mm drilled to receive # 11 wire.

.2 Cables and Accessories: Factory galvanized cables, wire tighteners, eye bolts and turnbuckle. Use turn buckles with 150mm long eyes and 10mm dia. threaded opening for tightening.

.3 Guy Wires: #11 gauge galvanized wire for smaller trees than 75 mm dia.

.4 Rubber Hose: Two ply, reinforced, 13mm diameter, new, rubber garden hose.

.5 Mulch: S hredded bark mulch (not hardwood chips) varying in size from 25 to 75mm in length, from coniferous trees or approved equal and free of chemicals. Submit sample to Landscape Architect prior to shipping to site.

.6 Mycorrhizal inoculants: (Active ingredients: Endomycorrhizal fungus Glomus intraradices and Ectomycorrhizal fungus Pisolithus tinctorius). Available in 30 L (bag) from Premier Tech (1 Premier Avenue, Riviere-du-Loup, Québec, G5R 6C1, Tel: (418) 867-8883, toll free: 800 606 6926, Fax: (418) 867-3999, www.usemyke.com), or approved equivalent. To be stored: avoid freezing and intensive heat; store in a dry place out of direct sunlight.

2.3 Plant Material Delivery, Storage and Protection

.1 All plants shall be packed, transported and handled with the care necessary to insure protection from injury. Plants shall be handled by their root zones only, and must not be dropped, thrown or otherwise roughly handled.

.2 Protect all plant material from damage and breakage. Protect all parts of the plant material from drying out from the time of digging until they are installed.

.3 Do not transport plant materials in an open truck. Plants shall be protected from over heating or excessive transpiration during transport and site storage using protective tarps with adequate ventilation.

.4 All branches are to be carefully tied in before transporting.

.5 Protect stored plant material from frost, wind and sun and as follows:

.1 For bare root plants, preserve moisture around roots by heeling-in roots in topsoil and watering to full depth of root zone.

.2 For pots and containers, monitor moisture levels daily and irrigate as required.

.3 Heel-in Fibre pots shall be heeled into topsoil and monitored for adequate moisture.

.4 For balled and burlapped and wire basket root balls, place to protect branches from damage. Monitor and maintain moisture level in root zones.

.6 Rodent Protection: Skoot or approved substitute. All shrubs and ground covers to be treated with an application of rodent repellent, prior to each winter season throughout the warranty period.

PART 3 **EXECUTION**

3.1 Equipment

.1 Ensure that equipment, material and vehicles remain within the approved work zone. Any access to areas outside the working limits as defined in the Contract must be approved in writing by the City's Representative.

3.2 Pre-Planting Operations

.1 Ensure plant materials are acceptable to City's Representative.

.2 Remove damaged roots and branches from plants.

.3 Ensure all grading works are complete prior to planting.

3.3 Preparation of Planting Beds

.1 Locations of planting beds are specified on contract drawings and accompanying details.

.2 Ensure planting soil has been installed in all areas and to depths indicated.

.3 Stake out the location of plant material per the contract drawings and accompanying Details. The Contractor shall review the final placement of trees and shrub groupings with the City's Representative and obtain approval prior to proceeding with planting operations.

3.4 Planting Period

.1 When permission from the City's Representative has been obtained, plant material growing in containers may be planted throughout growing season.

.2 Ensure that watering facilities are available. Take particular care and apply anti-desiccant in accordance with manufacturer's specifications when planting during heat of summer.

.3 Plant only under conditions that are conducive to health and physical conditions of plants.

.4 Plant in accordance with the planting schedule approved by the City's Representative. Extending planting operations over protracted periods using limited crew will not be accepted.

3.5 Planting Operation

.1 For bare root stock, place 75-100mm backfill soil in bottom of hole. Plant shrubs and ground covers with roots placed straight out in hole. Place the clump of roots in hole with top of root crown at ground level. Backfill with approved topsoil and pack down lightly working the soil in between the roots and tamping firmly to remove any air pockets and to secure plant into the soil. Apply water to settle soil, and apply additional soil to fill voids.

.2 For jute burlapped root balls, cut away top one third of wrapping and wire basket without damaging root ball. Do not pull burlap or rope from under root ball. Cut and remove all nylon rope around trunks.

.3 For container stock or root balls in non-degradable wrapping, remove entire container or wrapping without damaging root ball.

.4 Place plant material to depth equal to depth they were originally growing in nursery. Build a soil saucer around outer edge of hole to assist with maintenance watering.

.5 Water plant material thoroughly. After soil settlement has occurred, fill with soil to finish grade.

3.6 Pruning

.1 Plants shall be pruned after planting. The amount of pruning shall be limited to the minimum necessary to remove dead or injured branches.

.2 Pruning shall be completed in such a manner as to preserve the natural character and form of the plants.

3.7 Mulching

.1 Obtain approval of planting from City's Representative before mulching material is applied. All mulch shall consist of clean shredded bark mulch and be free from matured seeds, living plant materials that may become established, or any chemical detrimental to the development of plants. Loosen soil in planting beds and remove debris and weeds.

.2 Mulch shall be applied in a continuous layer throughout all tree and shrub planting areas (planting soil areas that are not seeded).

.3 Apply mulch to the following minimum thicknesses:

.1 100mm in all tree and shrub planting areas. Keep mulch 100 mm away from crown of plant. Ensure soil settlement has been corrected prior to mulching.

3.8 Mycorrhizal Inoculant

.1 Dig a round hole as specified in 3.5 Planting Operation. Apply a layer of Mycorrhizal Inoculant to the walls of the hole so that bare roots are in contact with the product. Apply 60ml (1/4 cup) of inoculant in each planting hole.

.2 Place the clump of roots in hole with top of clump level with topsoil grade. Backfill with topsoil and pack down lightly working the soil in between the roots and tamping firmly to remove any air pockets and to secure plant into the topsoil.

3.9 Tree Guards

.1 Protective guards shall be installed around all deciduous trees of all sizes to prevent rodent damage. Guards shall be installed prior to the application of shredded bark mulch.

.2 Deciduous trees larger than 1.75 m in height shall be protected using one of; 13 mm hardware cloth wire mesh guard, expanded diamond pattern wire mesh guard or 150 mm plastic drainage pipe.

.3 Wire mesh guards shall be cut in lengths sufficient to complete a circumference of the tree trunk, maintaining a minimum 50 mm distance from the tree trunk, as well as providing a minimum 25 mm overlap. Guards shall be a minimum of 600 mm in height. Wire mesh guards shall be fastened using a minimum of 4 hog rings or clips per guard.

.4 Plastic drainage pipe shall be cut to a minimum 600 mm length and then slit once vertically and placed around the tree trunk.

.5 Deciduous trees less than 1.75 m in height shall be protected using a spiral, plastic, perforated tree wrap installed as per manufacturer's recommendations. Wrap should be cut short of branches if branches are lower than 600 mm.

3.10 Restoration and Clean-up

.1 At the completion of planting operations, all areas disturbed or damaged from execution of this work shall be restored to their original condition, including, but not restricted to clean-up and regrading, and seeding and mulching.

3.11 Maintenance During Warranty Period

.1 Water once weekly for first four (4) weeks and then sufficiently thereafter to maintain optimum growing conditions. For evergreen plant material, water thoroughly in late fall prior to freeze-up to saturate soil around root system.

.2 Replace or re-spread damaged, missing or disturbed mulch.

.3 Provide adequate protection against winter damage caused by rodents and wind.

.4 During the warranty period, all trees, shrubs and ground covers to be treated with an application of rodent repellent (Skoot or approved substitute) prior to each winter season.

.5 Remove dead or broken branches from plant materials.

.6 Remove and replace dead plants not in healthy growing condition. Make replacements in same manner as specified for original plantings.

.7 At the end of the warranty period, the Contractor will remove and dispose of all plant supports including tree stakes, guy wires, burlap and wooden stakes.

3.12 Quality Assurance

.1 The work in this Section shall be executed by a Contractor who has adequate facilities, equipment, and skilled supervisors and tradesmen to perform work expeditiously, and who is known to have been responsible for satisfactory installations during a period of at least five years.

.2 Planting works to be carried out by personnel, with a proven record in working within sensitive natural environments, under the direction of a skilled site superintendent.

3.13 Inspection

.1 The Contractor shall notify the City's Representative within three (3) working days of pending plant shipment arrival time. The City's Representative shall inspect all plant materials when they arrive and reserves the right to reject any material that does not conform to standards, species and specifications.

.2 A Preliminary inspection shall occur upon the completion of all planting works to initiate the start of the Warranty Period. Preliminary Acceptance will be granted provided the City's Representative is satisfied with the quality and completion of the planting works as specified.

.3 An Interim inspection shall occur one year after the start of the Warranty Period to ensure that the required maintenance is being undertaken.

3.14 Final Acceptance

.1 A final inspection shall occur one year after the start of the Warranty Period. The City's Representative will accept the plantings at this time provided that all plant materials exhibit a healthy growing condition and are free from disease, insects and fungal organisms.

3.15 Warranty

.1 The Contractor shall warrant that plant material as itemized on the plant list in the contract drawings and/or schedule of quantities and prices will remain free of defects for 2 years following the date of Substantial Completion by the City's Representative.

.2 During the warranty period the Contractor shall be responsible for watering, pruning, rodent protection, mulch top-up, and replacement plantings. The Contractor is responsible for removing all tags, supports and stakes at the end of the warranty period.

END OF SECTION

PART 1 GENERAL

1.1 Related Sections

.1 Section 02770 – Concrete Walks, Curbs and Gutters.

1.2 References

.1 American Society for Testing and Materials (ASTM).

.1 ASTM D1751-[99], Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types).

.2 Canadian General Standards Board (CGSB).

.1 CAN/CGSB-19.24-[M90], Multicomponent, Chemical-Curing Sealing Compound.

.3 Canadian Standards Association (CSA).

.1 CAN/CSA-A23.1-[00], Concrete Materials and Methods of Concrete Construction.
.2 CAN/CSA-A23.2-[00], Methods of Test for Concrete.
.3 CAN/CSA-A3000-[98]-A5-[98], Portland Cement.
.4 CAN/CSA-G30.5-[M1983(R1998)], Welded Steel Wire Fabric for Concrete Reinforcement.
.5 CAN/CSA-G30.18-[M92(R1998)], Billet-Steel Bars for Concrete Reinforcement.

1.3 Submittals

.1 Shop Drawings

.1 Submit placing drawings prepared in accordance with plans to clearly show size, shape, location and all necessary details of reinforcing.
.2 Submit drawings showing formwork and falsework design to: CAN/CSA-A23.1.
.3 Drawings to bear stamp and signature of qualified professional engineer registered or licensed in province of Ontario, Canada.

PART 2 PRODUCTS

2.1 Materials

.1 Portland cement: to CAN/CSA-A3000-A5, Type 10.

.2 Reinforcing bars: to CAN/CSA-G30.18, Grade 400.

.3 Welded steel wire fabric: to CAN/CSA-30.5.

.4 Premoulded joint filler:

.5 Bituminous impregnated fibreboard: to ASTM D1751.

.6 Joint sealer/filler: grey to CAN/CGSB-19.24, Type 1, Class B.

.7 Sealer: boiled linseed oil, mixed with mineral spirits 1:1.

.8 Other concrete materials: to CAN/CSA-A23.1.

2.2 Mixes

.1 Proportion concrete in accordance with CAN/CSA-A23.1.

.2 Minimum compressive strength at 28 MPa.

.3 Class of exposure: to CAN/CSA-A23.1, Table 11.

.4 Nominal maximum size of coarse aggregate: to CAN/CSA-A23.1.

.5 Slump: to CAN/CSA-A23.1.

.6 Air content: concrete to contain purposely entrained air in accordance with CAN/CSA-A23.1, Table 10.

.7 Admixtures: to CAN/CSA-A23.1.

PART 3 EXECUTION

3.1 Construction

.1 Do cast-in-place concrete work in accordance with CAN/CSA-A23.1.

3.2 Inserts

.1 Cast in sleeves, ties, slots, anchors, reinforcement, frames, conduit, bolts, waterstops, joint fillers and other inserts required to be built-in. Sleeves and openings greater than 100 mm x 100 mm not indicated, must be approved by City's Representative.

3.3 Finishes

.1 Pavements, walks, curbs and exposed site concrete:

.1 Screed to plane surfaces and use wood floats.
.2 Provide round edges and joint spacings using standard tools.
.3 Provide broom finish.

3.4 Control Joints

.1 Cut control joints in slabs on grade at locations indicated, in accordance with CAN/CSA-A23.1 and install specified joint sealer/filler.

3.5 Expansion and Isolation Joints

.1 Install premoulded joint filler in expansion and isolation joints full depth of slab flush with finished surface.

3.6 Curing

.1 Cure and protect concrete in accordance with CAN/CSA-A23.1.

.1 Do not use curing compounds where bond is required by subsequent topping or coating.

3.7 Sealing

.1 Following curing, apply two even coats of linseed oil mixture to clean dry surfaces, each at 8 m^2/L. Allow first coat to dry before applying second coat.

3.8 Field Quality Control

.1 Concrete testing: to CAN/CSA-A23.2 by testing laboratory designated and paid for by Contractor. Accelerated test methods will apply.

END OF SECTION

PART 1 GENERAL

1.1 Related Sections

.1 Section 01330 - Submittal Procedures.

.2 Section 01610 - Common Product Requirements.

.3 Section 02224 - Excavating, Trenching and Backfilling.

.4 Section 02516 – Asphalt Concrete Pavement.

.5 Section 02550 – Crushed Stone Surfacing.

1.2 References

.1 American Society for Testing and Materials International, (ASTM).

- .1 ASTM C117-[95], Standard Test Method for Material Finer Than 0.075 mm (No. 200) Sieve in Mineral Aggregates by Washing.
- .2 ASTM C136-[01], Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.
- .3 ASTM D698-[00a], Standard Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft3 (600 kN-m/m3)).
- .4 ASTM F667-[97], Standard Specification for Large Diameter Corrugated Polyethylene Pipe and Fittings.

.2 Canadian General Standards Board (CGSB).

- .1 CAN/CGSB-8.1-88, Sieves, Testing, Woven Wire, Inch Series.
- .2 CAN/CGSB-8.2-M88, Sieves, Testing, Woven Wire, Metric.

.3 Canadian Standards Association (CSA International).

- .1 CSA-G401-[01], Corrugated Steel Pipe Products.

1.3 Submittals

.1 Submit samples in accordance with Section 01330 - Submittal Procedures.

.2 Inform City’s Representative at least 4 weeks prior to beginning Work, of proposed source of bedding materials and provide access for sampling.

.3 Submit to City’s Representative for testing, at least 4 weeks prior to beginning Work, following samples of materials proposed for use: corrugated steel pipe.

.4 Submit manufacturer's test data and certification at least 4 weeks prior to beginning Work.

.5 Certification to be marked on pipe.

1.4 Delivery, Storage and Handling

.1 Deliver, store and handle materials in accordance with Section 01610 - Common Product Requirements.

PART 2 PRODUCTS

2.1 Corrugated Steel Pipe

.1 Corrugated steel pipe: to [CSA-G401].

.2 Water-tight cut-off collars: as indicated.

.3 Prefabricated end sections and wing walls: as indicated.

.4 Corrugated fluming: to CSA-G401.

2.2 Granular Bedding and Backfill

.1 Granular bedding and backfill material to the following requirements:

.2 Crushed pit run or screened stone, gravel or sand.

.1 Gradations to be within limits specified when tested to ASTM C136 and ASTM C117. Sieve sizes to CAN/CGSB-8.2.

Sieve Designation	% Passing
200 mm	-
75 mm	[100]
50 mm	-
38.1 mm	-
25 mm	-
19 mm	-
12.5 mm	-
9.5 mm	-
4.75 mm	[25-85]
2.00 mm	-
0.425 mm	[5-30]
0.180 mm	-
0.075 mm	[0-10]

PART 3 EXECUTION

3.1 Trenching

.1 Do trenching Work in accordance with Section 02224 - Excavating Trenching and Backfilling.

.2 Obtain City’s Representative's approval of trench line and depth prior to placing bedding material or pipe.

3.2 Bedding

.1 Dewater excavation, as necessary, to allow placement of culvert bedding in dry condition.

.2 Place minimum thickness of 200 mm of approved granular material on bottom of excavation and compact to minimum 95% of maximum density to ASTM D698.

.3 Shape bedding to fit lower segment of pipe exterior so that width of at least 50% of pipe diameter is in close contact with bedding and to camber as indicated or as directed by City's Representative, free from sags or high points.

.4 Place bedding in unfrozen condition.

3.3 Laying Corrugated Steel Pipe Culverts

.1 Begin pipe placing at downstream end.

.2 Ensure bottom of pipe is in contact with shaped bed or compacted fill throughout its length.

.3 Lay pipe with outside circumferential laps facing upstream and longitudinal laps or seams at side or quarter points.

.4 Lay paved invert or partially lined pipe with longitudinal centre line of paved segment coinciding with flow line.

.5 Do not allow water to flow through pipes during construction except as permitted by City's Representative.

3.4 Joints: Corrugated Steel Culverts

.1 Corrugated steel pipe:

- .1 Match corrugations or indentations of coupler with pipe sections before tightening.
- .2 Tap couplers firmly as they are being tightened, to take up slack and ensure snug fit.
- .3 Insert and tighten bolts.
- .4 Repair spots where damage has occurred to spelter coating by applying two coats of zinc rich paint.

.2 Structural plate:

- .1 Erect in final position by connecting plates with bolts at longitudinal and circumferential seams.
- .2 Drift pins may be used to facilitate matching of holes.
- .3 Place plates in sequence recommended by manufacturer with joints staggered so that not more than three plates come together at any one point.
- .4 Draw bolts up tight, without overstress, before beginning backfill.
- .5 Repair spots where damage has occurred to spelter coating by applying two coats of zinc rich paint approved by City's Representative.

3.5 Backfilling

.1 Backfill around and over culverts as indicated.

.2 Place granular backfill material as indicated, in 150 mm layers to full width, alternately on each side of culvert, so as not to displace it laterally or vertically.

.3 Compact each layer to 95% maximum density to ASTM D698 taking special care to obtain required density under haunches.

.4 Protect installed culvert with minimum 200 mm cover of compacted fill. Avoid crossing with heavy equipment. During construction, width of fill, at its top, to be at least twice diameter or span of pipe and with slopes not steeper than 1:2.

.5 Place backfill in unfrozen condition.

3.6 Fluming

.1 Assemble and install fluming as indicated.

.2 Set top edges of fluming flush with side slope.

END OF SECTION