ASHBURY COLLEGE - MAPLE LANE

362 Mariposa Avenue
Ottawa, Ontario
K1M 0T3

Project No. 1916-02

ISSUED FOR TENDER

February 4, 2020

SPECIFICATIONS

CSW

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Legend:
Documents prepared by the following consultants are indicated as per the following abbreviations:
Landscape Architect (CSW)

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DIVISION 01

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Part 1 General

1.1 ADMINISTRATIVE

.1 Submit to Consultant submittals listed for review. Submit with reasonable promptness and in an orderly sequence so as not to cause delay in the 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 the submittal shall not proceed until review is complete.

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

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

.5 Contractor's responsibility for errors, omissions, and deviations from requirements of Contract Documents in submission is not relieved by Consultant's review.

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

1.2 RELATED SECTIONS

.1 Section 01 33 23 - Shop Drawings, Product Data, Samples, Mock-ups and Warranty

1.3 SHOP DRAWINGS AND PRODUCT DATA

.1 Section 01 33 23- Shop Drawings, Product Data, Samples, Mock-ups and Warranty

.2 Indicate materials, methods of construction and attachment of anchorage, erection diagrams, connections, explanatory notes, and other information necessary for completion of Work. Where articles or other equipment attach or connect to other articles or equipment, indicate that such items have been coordinated, regardless of the Section under which the adjacent items will be supplied and installed. Indicate cross-references to design drawings and specifications.

.3 Adjustments made on shop drawings by the Consultant are not intended to change the Contract Price. If adjustments affect the value of the Work, state such in writing to the Consultant prior to proceeding with the Work.

.4 Submit six (6) copies of product data sheets or brochures for requirements requested in Specification Sections and as Consultant may reasonably request where shop drawings are not prepared due to standardized manufacture of product.

1.4 SAMPLES

.1 Submit for review samples in triplicate as requested in respective Specification Sections. Label samples as to origin and intended use in the Work.

.2 Deliver samples prepaid to Consultant's business address.

.3 Notify the Consultant in writing at the time of submission of deviations in samples from the requirements of Contract Documents.

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

.5 Make changes in samples, which the Consultant may require, consistent with Contract Documents.

1.5 RECORD DRAWINGS

.1 After award of Contract, the Consultant will provide a set of drawings for the purpose of maintaining record drawings. The Contractor shall accurately and neatly record any

deviations from the Contract Documents caused by site conditions and changes ordered by the Consultant.

.2 Record the locations of concealed components of mechanical and electrical services.

.3 Identify drawings as 'Project Record Copy'. Maintain in new condition and make available for inspection on site by Consultant.

.4 On completion of Work and prior to final inspection, submit record documents to Consultant.

1.6 CERTIFICATES AND TRANSCRIPTS

.1 Immediately after issue of letter of intent, or contract, submit Workers Compensation Board status and transcripts of Insurances.

END OF SECTION

Part 1 General

1.1 SECTION REQUIREMENTS

.1 This section specifies general requirements and procedures for contractor's submissions of shop drawings, product data, samples and mock-ups to Consultant for review.

.2 Do not proceed with work until relevant Consultant reviews submissions.

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

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

.5 Notify Consultant, in writing at time of submission, identifying deviations from requirements of Contract Documents stating reasons for deviations.

.6 Make any changes in submissions, which Consultant may require consistent with Contract Documents and resubmit as directed by Consultant.

.7 Notify Consultant, in writing, when resubmitting, of any revisions other than those requested by Consultant.

1.2 RELATED SECTIONS

.1 Section 01 33 00 - Submittal Procedures

1.3 SUBMISSION REQUIREMENTS

.1 Coordinate each submission with requirements of work and Contract Documents. Individual submissions will not be reviewed until all related information is available.

.2 Allow 7 days for Consultants review of each submission.

.3 Accompany submissions with transmittal letter, in duplicate, 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.

.4 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 Contractors 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.

.6 After Consultant's review, distribute copies.

1.4 SHOP DRAWINGS

.1 Shop drawings: original drawings, or modified standard drawings provided by Contractor, illustrate details of portions of Work, which are specific to project requirements.

.2 Maximum sheet size: 850 x 1050 mm.

.3 Submit shop drawings as follows:

.1 One reproducible transparency on plastic film and 5 opaque diazo prints.

.4 Cross-reference shop drawing information to applicable portions of Contract Documents.

.5 All shop drawings, unless otherwise directed by the Consultant, shall bear the seal and signature of a Professional Engineer licensed in the provinces of Quebec or Ontario.

1.5 PRODUCT DATA

.1 Product data: manufacturers catalogue sheets, brochures, literature, performance charts and diagrams, used to illustrate standard manufactured products.

.2 Submit 6 copies of product data.

.3 Sheet size: 215 x 280 mm, maximum of 3 modules.

.4 Delete information not applicable to project.

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

.6 Cross-reference product data information to applicable portions of Contract Documents.

1.6 SAMPLES

.1 Samples: examples of materials, equipment, quality, finishes, workmanship.

.2 Where color, pattern, or texture is criterion, submit full range of samples.

.3 Reviewed and accepted samples will be standard of workmanship and material against which installed work will be verified.

.4 Submissions required as directed by the Consultant, or as specified elsewhere in the Contract documents.

1.7 SHOP DRAWINGS REVIEW

.1 The review of shop drawings by the Consultant is for the sole purpose of ascertaining conformance with the general concept. This review shall not mean that the Consultant approves the detail design inherent in the shop drawings, responsibility for which shall remain with the Contractor submitting same, and such review shall not relieve the Contractor of responsibility for errors or omissions in the shop drawings or of responsibility for meeting all requirements of the construction and contract documents. Without restricting the generality of the foregoing, the Contractor is responsible for dimensions to be confirmed and correlated at the job site, for information that pertains solely to fabrication processes or to techniques of construction and installation and for co-ordination of the work of all sub-trades.

1.8 CERTIFICATE OF CONFORMANCE

.1 A Certificate of Conformance shall be submitted to the Consultant, stating that the component (s) has been installed in conformance with the approved shop drawings. The Certificate of Conformance shall bear the seal and signature of a Professional Engineer licensed in the province of Ontario or Quebec as required.

.2 Certificates of Conformance shall be required for, but not limited to the following:

.1 All components where shop drawings are required (unless otherwise directed by the Consultant);

.2 Bearing seal;

.3 False work foundations (unless mudsill bears directly on bedrock);

.4 Dry film thickness of each coating of paint.

1.9 PROCEDURES

.1 Procedures shall be required as specified in the Contract Documents or as directed by the Consultant.

1.10 OTHER SUBMISSIONS

.1 Construction schedule updated every month.

.2 All other legal submissions as required by law and the Contract Documents.

1.11 WARRANTIES

.1 Written warranties of one (1) year shall be required for the following:

.1 Spalling, scaling, or evidence of visible cracking on all concrete.

.2 Galvanizing and painting on all metal against peeling and the appearance of rust.

.2 Written warranties of two (2) years shall be required for planting.

.3 Warranties shall commence upon the issuance of the Substantial Completion.

END OF SECTION

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Part 1 General

1.1 SAFETY REGULATIONS

.1 Comply with applicable safety and health laws, regulations, and codes, including, but not limited to the latest edition or amendment of the following documents.

- .1 The Occupational Health and Safety Act Regulations for Industrial Establishments, R.R.O. 1990, Regulation 851 (includes Confined Space Access).
- .2 Occupational Health and Safety Act R.S.O. 1990, Chap.01.
- .3 Hazardous Products Act R.S.C. 1985, Chap.H-3 Canadian Labour Code, R.S.C. 1985, Chap.L-2.
- .4 Occupational Health and Safety Regulation for Construction Projects, Ontario Regulation 213/91.
- .5 Workers Compensation Act R.S.O. 1990, Chap W-11.
- .6 Ontario Building Code Act R.S.O. 1990, Regulation 61.
- .7 Fire Marshals Act Regulations for Fire Code, R.R.O. 1990, Regulation 454.
- .8 Environmental Protection Act for General Waste Management, R.R.O. 1990, Regulation 347.
- .9 Workers Compensation Act Regulations for First Aid Requirements, R.R.O. 1990, Regulation 1101.
- .10 In the event of conflict between regulations, the more stringent provision shall apply.

1.2 GENERAL HEALTH AND SAFETY REQUIREMENTS

.1 Take all necessary steps to protect construction personnel, visitors, building users, the general public, and property from all hazards arising out of the execution of the Contract.

.2 Supply competent personnel to implement the safety program and to monitor compliance with safety requirements.

.3 Remove from the site any person not observing or complying with safety requirements.

.4 The department representative will monitor on a regular basis to ensure that safety requirements are met, and that safety records are being properly kept and maintained.

.5 Initial disregard for safety standards will cause the Contractor to be subject to a safety review. This review will become part of the Contract Record Documents. Report to the department representative and jurisdictional authorities, any accident or incident involving the Contractor, or the public, personnel and/or property, arising from the Contractor's execution of the Work.

.6 Include all pertinent provisions of the Contract in any agreement with Subcontractors and hold all Subcontractors equally responsible for safe work performance.

1.3 MATERIAL SAFETY DATA SHEETS

.1 Material Safety Data Sheets (MSDSs) for those controlled products known to exist in the Work area shall form part of the Contract Documents. They shall be kept on site at all times and will be furnished to the Contractor upon request.

1.4 CONFINED SPACES

.1 Where applicable, provide equipment and appropriately trained personnel necessary to enter and work in confined spaces.

.2 If applicable, Confined Space Survey Forms will be provided by the Owner and shall form part of the Contract Documents.

1.5 PRE-CONSTRUCTION SAFETY MEETING

.1 If appropriate to the Project's scope of work, a Pre-construction Safety Meeting shall be held. Attendees:

- .1 The Consultant
- .2 The Contractor
- .3 Major Subcontractors
- .4 The agenda shall include:
  - .1 Work areas; work contents and methods
  - .2 Definition of responsibilities
  - .3 Identification and recording of name(s) of the Contractor's job safety representative(s) for this Contract (who shall be present at the meeting).

.2 The job safety representative(s) appointed for this Contract shall not be changed without the client's prior agreement.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

.1 Environmental Protection Act R.S.O. 1980.

1.2 SUBMISSION

.1 All submissions shall be in accordance with Section 01 33 40 - Shop Drawings, Product Data, Samples, and Mock-ups.

.2 Where excess material is managed by disposal as waste, a copy of the weight ticket(s) or receipt(s) provided by the site operator shall be submitted to the Consultant on a weekly basis. Where such documentation is not available, written confirmation that the waste has been received shall be obtained from the owner of the disposal site, and provided to the Consultant, a maximum of two weeks after disposal activities are complete.

Part 2 Disposal

2.1 FIRES AND DISPOSAL

.1 Fires and burning of rubbish on site are not permitted.

.2 Do not bury rubbish and waster on site unless approved by Consultant.

.3 Do not dispose of waste or volatile materials, such as mineral spirits, oil or paint thinner into waterways, storm, and sanitary sewers or be taken up by vegetation.

Part 3 Execution

3.1 MANAGEMENT OF EXCESS MATERIALS

.1 The contractor shall comply with all Provincial and Federal restrictions for the disposal of all wastes.

.2 Where an excess material is a mixture of materials, it shall be managed in compliance with the most stringent conditions associated with the constituent excess materials.

.3 For waste that has been classified as non-hazardous solid industrial waste or commercial waste, the following shall apply:

- .1 The materials shall be transported to a waste disposal site with a Certificate of Approval for a Waste Disposal site valid for non-hazardous solid industrial or commercial waste.
- .2 For each shipment the material from the project site, the carrier shall be one of the following:

.1 a hauler who also undertook a portion of the cleaning/coating operation, without a Certificate of Approval for a Waste Management System, valid for non-hazardous solid industrial or commercial waste.

.4 For waste that has been tested as contaminated waste, the following shall apply: (assume top 300mm of excavation)

- .1 The materials shall be transported to a waste disposal site with a Certificate of Approval for a Waste Disposal Site valid for toxic solid waste.
- .2 For each shipment of the material from the project site, the carrier shall have a Certificate of Approval for a Waste Management System, valid for toxic solid waste.

.5 A Certificate of Approval for a Waste Management System shall be valid for all of the following:

.1 the entire period of the work;

.2 the entire area within the limits of the work and the entire haul route;

.3 the equipment to be utilized and

.4 the waste classification of the material being transported.

3.2 DRAINAGE

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

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

.3 Control disposal or runoff of water containing suspended materials or other harmful substances in accordance with local authority requirements.

3.3 SITE CLEARING AND PLANT PROTECTION

.1 Protect trees and plants on site and adjacent properties where indicated in accordance with Section 32 01 90.33- Tree Preservation.

.2 Restrict tree removal to areas indicated or designated by Consultant.

.3 Protect roots of designated trees as determined by the Consultant during excavation and site grading. Avoid all traffic, dumping and storage of material over roots.

3.4 WORK ADJACENT TO WATERWAYS

.1 Do not operate equipment in waterways.

.2 Do not use waterway beds for borrow material.

.3 The Contractor shall ensure that no contamination, waste or other substances which may be detrimental to marine life or quality of water shall enter the river as either a direct or indirect result of construction and the Contractor Shall meet all requirements of Government authorities or agencies with respect to environmental protection.

.4 The Contractor shall be prepared to immediately clean up any spills of contamination, waste or other substances, which may be either detrimental to marine life or quality of water. In the event of a spill, the Contractor shall immediately commence a clean-up operation. The Contractor shall be liable for all damages and/or charges laid which result, either directly or indirectly, from the spill, or contamination of any kind, which results from his construction operations.

3.5 POLLUTION CONTROL

.1 Maintain temporary erosion and pollution control features installed under this contract.

.2 Control emissions from equipment and plant to local authorities emission requirements.

.3 Cover or wet down dry materials and rubbish to prevent blowing dust and debris. Provide dust control for temporary roads.

.4 The enclosure shall conform to the requirements of the Occupational Health and Safety Act, Revised Status of Ontario, 1989 and to those of Ontario Regulation 156/84, together with its amendments.

3.6 EROSION AND SEDIMENT CONTROL

.1 Provide temporary erosion and sedimentation control measures to prevent soil erosion and discharge of soil-bearing water runoff or airborne dust outside of the excavation limits, according to requirements of authorities having jurisdiction

.2 Inspect, repair, and maintain erosion and sediment control measures during construction until permanent vegetation has been established

.3 Remove erosion and sedimentation controls and restore and stabilize areas disturbed during removal

END OF SECTION

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Part 1 General

1.1 INSPECTIONS AND TESTING

.1 The following inspection and testing services will not be paid for by the Owner and are the responsibility of the Contractor:

- .1 Inspection and testing required by laws, ordinances, rules, regulations, or orders of public authorities.
- .2 Testing, adjustment and balancing of conveying systems, mechanical and electrical equipment and system.
- .3 Granular and base compaction testing for paving and structures.
- .4 Inspection and testing performed exclusively for the Contractor's convenience.
- .5 Testing of all cast-in-place concrete.

1.2 RE-TESTING

.1 When tests and inspections by the designated inspection and testing organization or field reviews by the consultant reveal work which is not in accordance with the Contract Documents, the Contractor shall pay the costs of such additional tests, inspections and filed reviews by testing organizations

END OF SECTION

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Part 1 General

1.1 SECTION REQUIREMENTS INCLUDE

.1 Related Requirements
.2 Barriers
.3 Construction Parking
.4 Utilities
.5 Protection
.6 Site Offices
.7 Project Identification
.8 Cleaning
.9 Shut Downs

1.2 BARRIERS

.1 **Construction Barrier:** Modu-loc, 1800mm height, metal fence panels (or approved equal). Posts shall be securely anchored to the ground.

.2 **Guard Rails and Barricades:** provide secure railings and barricades to protect public and keep them safe from working areas.

1.3 CONSTRUCTION PARKING

.1 Contractors will make themselves aware of the fact that there is no parking permitted on the Owner's property. A violator of the regulations may be issued with a parking ticket or have a vehicle towed away at their own expense and risk.

1.4 UTILITIES

.1 **Water Supply:** the Owner will designate source of water and the Contractor will make the tie-in through a shut-off valve. All water extensions from this point to the job site will be by the Contractor and these extensions must be approved by the Owner to avoid possible accidental reverse flow.

.2 **Temporary Power and Light:**

.1 The Contractor will pay for temporary power required during construction for construction lighting and the operating of power tools, to a maximum supply of 230 volts, 30 amps. Temporary power in excess of above is the responsibility of the Contractor.

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

1.5 TEMPORARY TELEPHONE

.1 Provide and pay for temporary telephones necessary for own use.

1.6 PROJECT IDENTIFICATION

.1 Construction Signage:

.1 Signs or advertisements are permitted on site, subject to Owner approval.

.2 Provide warning signs as required by governing authorities.

.3 Contractor is responsible for posting detour signs. Sign design, layout, and posting location will be provided to the contractor.

1.7 CLEANING

.1 Project Cleanliness:

.1 Maintain the Work in tidy condition, free from the accumulation of waste products and debris, other than that caused by the Owner or other Contractors.

.2 Remove waste material and debris from the site and deposit in waste container at the end of each working day.

1.8 SHUT-DOWN OF EQUIPMENT/SYSTEMS

.1 All shut-downs of utilities systems and equipment shall be co-ordinated by the Contractor through the Consultant with the Owner. A minimum of seven (7) days advance notice is required.

END OF SECTION

Part 1 General

1.1 PROCEDURES

.1 Comply with Ontario Association of Architects / Ontario General Contractors Association Document No. 100, November 1983, recommended procedures concerning Substantial Performance of construction contracts and completion take-over of projects.

1.2 TRAINING

.1 Conduct a pre-handover briefing and walk-through of the completed Work for the Owner's operations and maintenance staff, prior to Substantial Performance of the Work or receipt of an Occupancy Certificate for partial or full occupancy.

.2 Prior to an agreed handover date, arrange for a full and complete hands-on instruction program for the Owner's operations and maintenance staff.

1.3 FINAL CLEANING

.1 Prior to Substantial Performance, remove surplus products, tools, construction machinery and equipment not required for the performance of the remaining Work.

.2 Remove stains, dirt and smudges from finished surfaces.

.3 Clean exposed finished surfaces in accordance with respective material manufacturers' recommendations.

.4 Clean and polish glass, mirrors, hardware, wall tile, stainless steel, chrome, porcelain enamel, baked enamel, plastic laminate, mechanical and electrical fixtures. Replace broken, scratched or disfigured glass.

.5 Remove stains, spots, marks and dirt from decorative work, electrical and mechanical fixtures, furniture fitments, walls, and floors and other surfaces.

.6 Vacuum clean and dust building interiors, behind grilles, louvres and screens.

.7 Wax, seal, shampoo or prepare floor finishes, as recommended by the manufacturer.

.8 Inspect finishes, fitments and equipment and ensure specified workmanship and operation.

.9 Broom clean and wash exterior walks, steps and surfaces.

.10 Remove dirt and other disfiguration from exterior surfaces.

.11 Clean and sweep roofs, gutters, areaways, sunken wells.

.12 Sweep and wash clean paved areas.

.13 Clean mechanical and electrical fixtures and other fittings of labels, wrappings, paper and other foreign material.

.14 Replace heating, ventilation and air conditioning filters, if units were operated during construction.

.15 Clean ducts, blowers and coils if heating, ventilation and air conditioning systems were operated without filters during construction.

.16 Clean roofs, downspouts, and drainage systems.

.17 When the Work is Totally Performed, remove surplus products, tools, construction machinery and equipment. Remove waste products and debris.

1.4 OPERATIONS AND MAINTENANCE MANUALS

.1 Prepare comprehensive systems operations and maintenance manuals in formats to the Consultant. Submit three (3) copies in English.

.2 Submit draft manuals to the Consultant four (4) weeks before Project handover. The consultant and the Owner will coordinate their review with applicable specialist consultants and return the drafts to the Contractor with written comments.

.3 Submit manuals in their final form to the Consultant immediately prior to Project handover.

1.5 RECORD DRAWINGS

.1 The Consultant will provide one set of black line prints for record drawing purposes.

.2 Contractor shall maintain project as-built drawings and record accurately significant deviations from the Contract Documents caused by site conditions and changes orders by the Consultant.

.3 Mark changes in red ink.

.4 Where applicable record the following information:

.1 Depths of various elements of foundations in relation to finish ground floor.

.2 Horizontal and vertical locations of underground utilities and appurtenances referenced to a permanent surface improvement.

.3 Locations of internal utilities and appurtenances concealed in the construction, referenced to visible and accessible features of the structure.

.4 Field changes of dimension and detail.

.5 Changes made by Change Order, Additional Instruction or order for minor change in the Work.

.5 At the completion of the project and prior to final review, neatly and accurately transfer the recorded information on reproducible drawing sheets. Submit the completed documents to the Consultant prior to project handover and/or before final deficiency inspection of the Work, whichever occurs first.

.6 The Contractor is advised that periodic review of the as-built drawings will be made by the Consultant throughout the construction period to ensure that information is being properly recorded as the Work progresses.

1.6 WARRANTIES

.1 Immediately prior to Project handover, provide the Owner with all relevant standard and extended warranty documentation required by the Contract Documents.

.1 Include the names, addresses, and telephone numbers of all warrantors.

.2 Include emergency warranty response procedures.

1.7 DEFICIENCY HOLDBACK

.1 The submission of the specified operations and maintenance manual, record drawings, warranties and other Contract closeout documents is a requirement of the Contract and failure to submit any item to the satisfaction of the Consultant will be deemed to be a deficiency under the Contract. Accordingly, the Owner will withhold on account from payments due to the Contractor, 2% of the current billing amount and not less than $ 2,000.00 aggregate total. The purpose of this provision is to ensure that Contract closeout documents are accurately and properly prepared and submitted.

.2 This holdback will be released upon acceptance of all the required Contract closeout documents.

END OF SECTION

DIVISION 02

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Part 1 General

1.1 SECTION INCLUDES

.1 Take over structures to be removed based on their condition on the date that tender is accepted.

1.2 RELATED SECTIONS

.1 Section 01 35 43 Environmental Procedures

.2 Section 31 22 13 - Rough Grading

1.3 EXISTING CONDITIONS

.1 Take over structures to be demolished, based on their condition on the date that the tender is accepted.

1.4 PROTECTION

.1 Prevent movement, settlement or damage of adjacent structures, services, walks, paving, trees, landscaping, and adjacent grades. Provide bracing, and shoring if required. Make good damage and be liable for injury caused by demolition.

.2 Prevent debris from blocking drainage system, mechanical and electrical systems which must remain in operation.

1.5 PERMITS

.1 Contractor to obtain and pay for permits necessary to carry-out work.

Part 2 Execution

2.1 WORK

.1 Dispose of demolished materials except where noted otherwise and in accordance with authorities having jurisdiction.

.2 Contractor shall pay for testing associated with and required for removal/disposal of all materials.

2.2 PREPARATION

.1 Inspect site with Consultant and verify extent and location of items designated for removal, disposal, alternative disposal, recycling, salvage, and items to remain.

.2 Locate and protect utilities. Hand excavate down to sewer, water, all electrical, bell, television, and the like, where identified on drawings and/or where conflicts with services are anticipated. Open trenches to be photographed and inspected by Consultant prior to proceeding. Await instruction from Consultant on how to protect utility before commencing to next stage of work.

.3 Preserve active utilities traversing site in operating condition.

.4 Notify and obtain approval of utility companies before starting demolition.

.5 Disconnect and cap mechanical services in accordance with requirements of local authority having jurisdiction if required:

.1 Natural gas supply lines to be removed by gas company.

.2 Remove sewer and water lines and cap to prevent leakage.

.3 Remove and dispose of other underground services.

.6 Do not disrupt active or energized utilities traversing premises.

2.3 DEMOLITION

.1 Remove concrete, asphalt, and/or granular paving in areas as indicated on drawings, sufficient to complete the repaving work specified.

.2 Remove existing equipment, services, and obstacles where required for refinishing or making good of existing surfaces, and replace as work progresses.

.3 At the end of each day's work, leave work in safe condition so that no part is a danger to public safety.

.4 Demolish to minimize dusting. Keep dusty materials wetted.

.5 Do not sell or burn materials on the site.

.6 Remove contaminated or dangerous materials from the site, and dispose of in a manner that minimizes any danger during disposal.

.7 Remove any designated trees during demolition. Obtain written approval of Consultant prior to removal of trees.

.8 Stockpile topsoil for final grading and landscaping.

2.4 STOCKPILING

.1 Locate stockpiled materials convenient for use in new construction to eliminate double handling wherever possible.

.2 Stockpile materials designated for alternative disposal in location which facilitates removal from site and examination by potential end markets, and which does not impede disassembly, processing, or handling procedures.

2.5 REMOVAL FROM SITE

.1 Remove stockpiles of like materials by alternate disposal option once collection of materials is complete.

2.6 CLEANING

.1 Remove debris, trim surfaces and leave work site clean, upon completion of work.

.2 Use cleaning solutions and procedures which are not harmful to health, are not injurious to plants, and do not endanger wildlife, adjacent water courses or ground water.

END OF SECTION

DIVISION 03

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Part 1 General

1.1 RELATED SECTIONS

.1 Section 03 20 00 – Concrete Reinforcing

1.2 REFERENCE STANDARDS

.1 CSA Group

.1 CSA A23.1-14/A23.2-14, ‘Concrete Materials, and Methods of Concrete Construction/Methods of Test for Concrete, Includes Update No.1 (2011)’.

.2 CSA B111-1974(R2003) ‘Wire Nails, Spikes and Staples.

.3 CSA O86-14, ‘Engineering Design in Wood’.

.4 CSA O121-08 (R2013),‘Douglas Fir Plywood’.

.5 CSA O151-09,‘Canadian Softwood Plywood’.

.6 CSA O153-13,‘Poplar Plywood’.

.7 CSA O325-07(R2012), ‘Construction Sheathing’.

.8 CSA O437 Series- 93 (R2011), ‘Standards for OSB and Waferboard’.

.9 CSA S269.1-1975 (R2003),‘Falsework for Construction Purposes’.

.10 CAN/CSA-S269.3-M92 (R2013), Concrete Formwork.

.2 Underwriters Laboratories of Canada (ULC)

.1 CAN/ULC-S701-11, Standard for Thermal Insulation, Polystyrene, Boards, and Pipe Covering.

.3 Ontario Building Code (OBC), latest edition. Formwork Lumber: plywood and wood formwork.

Part 2 Products

2.1 MATERIALS

.1 Materials to CSA O121 and CSA O86.

.1 Exposed Surfaces: new square-edged, flat, smooth surfaced panels, free of holes, surface markings or other defects.

.2 Plywood: Douglas fir, to CSA 0121, solid one side, or medium density overlaid one side grade. High density overlaid grade for architectural concrete. Sound undamaged sheets with clean, true edges.

.2 Nails, spikes, and staples: galvanized, to CSA B111.

.3 Form Release Agent: approved non-staining form release oil, or other approved material shall be applied to faces of forms against where concrete will be placed, except where not required by the use of special coating of the forms. The release agent will be applied before placing reinforcing.

.4 Form Ties: removable or snap-off metal ties, fixed or adjustable length, free of devices leaving holes larger than 25 mm diameter in a concrete surface. For architectural concrete use snap ties with plastic cones and concrete plugs.

.5 Joint Tape: non-staining, impermeable, self-release type.

Part 3 Execution

3.1 Erection of Formwork

.1 Verify lines, levels, and grades before proceeding with formwork, and ensure dimensions agree with drawings.

.2 Construct forms to produce finished concrete conforming to shape, dimensions, locations and levels indicated, within tolerances required by CSA CAN/CSA-A23.1/A23.2.

.3 Obtain Consultant's consent for use of earth forms. Hand trim sides and bottoms and remove loose earth before placing concrete.

.4 Align form joints and make watertight. Keep form joints to a minimum.

.5 Use 20 mm chamfer strips on exposed corners of walls and curbs, unless otherwise specified.

.6 Form chases, slots, openings, drips, recesses, expansion and control joints as detailed.

.7 Set anchors, ties, bolts, nailers, templates, cast-in-hardware, steel connection units or other inserts into forms and secure against displacement during concreting.

.8 Leave formwork in place for following minimum periods of time after placing concrete: three days for walls and curbs.

.9 Re-use of formwork subject to requirements of CSA CAN/CSA-A23.1/A23.2.

.10 Use new formwork for concrete surfaces, which will be exposed to view.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

.1 Section 03 10 00 – Concrete Forming and Accessories

.2 Section 03 30 00 – Cast-in-Place Concrete

1.2 REFERENCE STANDARDS

.1 ASTM International

.1 ASTM A82/A82M-07 'Standard Specification for Steel Wire, Plain, for Concrete Reinforcement'.

.2 ASTM A143/A143M-07 (2014), Standard Practice for Safeguarding Against Embrittlement of Hot-Dip Galvanized Structural Steel Products and Procedure for Detecting Embrittlement.

.3 ASTM A775/A775M-07b (2014), Standard Specification for Epoxy-Coated Reinforcing Steel Bars.

.2 CSA International

.1 CSA A23.1-14/A23.2-14, 'Concrete Materials, and Methods of Concrete Construction/Methods of Test and Standard Practices for Concrete'.

.2 CSA A23.3-14 'Design of Concrete Structures'.

.3 CSW G30.5-M1983 (R1998) 'Welded Steel wire Fabric for Concrete Reinforcement'.

.4 CSA G30.18-09(R2014) 'Carbon Steel Bars for Concrete Reinforcement, Includes Update No. 1'.

1.3 SOURCE QUALITY CONTROL

.1 Upon request, provide Contract Administrator with certified copy of the mill test report of reinforcing steel, showing physical and chemical analysis.

1.4 SHOP DRAWINGS

.1 Clearly indicate bar sizes, spacing, location, and quantities of reinforcement and mesh, with identifying code marks to permit correct placement without reference to structural drawings. Prepare drawings in accordance with 'Reinforcing Steel Manual of Standard Practice'.

.2 Detail placement of reinforcing where special conditions occur.

.3 Design and detail lap lengths and bar development lengths to CAN3-A23.3, unless otherwise specified on drawings.

1.5 SUBSTITUTES

.1 Substitution of different size bars permitted only upon written approval of Contract Administrator.

Part 2 Products

2.1 MATERIALS

.1 Reinforcing Bars: billet steel, grade 400, deformed bars to CSA-G30.18.

.2 Welded Steel Wire Fabric: to ASTM A82/A82M. Provide in flat sheets only.

.3 Chairs, Bolsters, Bar supports, Spacers: adequate for strength and support of reinforcing construction conditions.

.4 Use chairs with plastic coated feet where slab and beam soffits will be exposed.

2.2 FABRICATION

.1 Fabricate reinforcing to CSA-A23.1/A23.2 'Concrete Materials and Methods of Concrete Construction/Methods of Test for Concrete'.

.2 Fabricate to tolerances specified by Reinforcing Steel Manual of Standard Practice.

.3 Acquire Engineer's review of locations of reinforcement splices other than shown on steel placing drawings.

.4 Ship bundles of bar reinforcement, clearly identified in accordance with bar list.

Part 3 Execution

3.1 FIELD BENDING

.1 Do not field bend reinforcement except where indicated or authorized by Contract Administrator.

.2 When field bending is authorized, bend without heat, applying a slow and steady pressure.

.3 Replace bars, which develop cracks or splits.

3.2 PLACING REINFORCEMENT

.1 Place reinforcing steel as indicated on drawings and in accordance with CSA-A23.1/A23.2.

.2 Maximum Chair Spacing:

.1 10 m – 600mm,

.2 15 m – 1200 mm,

.3 20 m – 1600 mm,

.4 25 m – 2000 mm

.3 Obtain Engineer's review of reinforcing steel and position before placing concrete.

.4 Clean reinforcing before placing concrete.

.5 Ensure welded wire fabric is adequately supported at centre of slab (or where indicated) during concrete placing.

.6 Paint the portion of dowel intended to move within hardened concrete with one coat of lead or asphalt paint. When paint is dry, apply a thick even film of mineral lubrication grease.

.7 Obtain Contract Administrators approval of reinforcing steel and position.

3.3 FIELD BENDING

.1 Do not field bend or field weld reinforcement, except where indicated or authorized by Engineer.

.2 When field bending is authorized, bend without heat, applying a slow and steady pressure.

.3 Replace bars, which develop cracks or splits.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

.1 Section 03 10 00 – Concrete Forming and Accessories

.2 Section 03 30 00 – Concrete Reinforcing

.3 Section 04 05 10 – Masonry Procedures

1.2 REFERENCE STANDARDS

.1 ASTM International

.1 ASTM C260/C260M-10a (2016) ‘Standard Specification for Air-Entraining Admixtures for Concrete’.

.2 ASTM C494/C494M-17‘Standard Specification for Chemical Admixtures for Concrete’.

.3 ASTM C1017/ C1017M-13e1‘Standard Specification for Chemical Admixtures for Use in Producing Flowing Concrete’.

.4 ASTM D1751-04(2013)e1 ‘Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and structural Construction (Nonextruding and Resilient Bituminous Types)’.

.5 ASTM A82/A82M-07 ‘Standard Specification for Steel Wire, Plain, for Concrete Reinforcement’.

.6 ASTM A143/A143M-07 (2014), Standard Practice for Safeguarding Against Embrittlement of Hot-Dip Galvanized Structural Steel Products and Procedure for Detecting Embrittlement.

.7 ASTM A775/A775M-07b (2014), Standard Specification for Epoxy-Coated Reinforcing Steel Bars.

.2 CSA Group

.1 CSA A23.1-14/A23.2-14 ‘Concrete Materials and Methods of Concrete Construction/Test Methods and Standard Practices for Concrete’.

.2 CSA A283-06(R2016) ‘Qualification Code for Concrete Testing Laboratories, Includes Update No. 1(2007), Update No. 2 (2013)’.

.3 CSA A3000-13 ‘Cementitious Materials Compendium (Consists of A30001, A3002, A3003, A3004 and A3005)’.

.4 CSA S269.1-16 ‘Falsework and Formwork’

.5 CSA A23.3-14 ‘Design of Concrete Structures’.

.6 CSW G30.5-M1983 (R1998) ‘Welded Steel wire Fabric for Concrete Reinforcement’.

.7 CSA G30.18-09(R2014) ‘Carbon Steel Bars for Concrete Reinforcement, Includes Update No. 1’.

.3 Ontario Building Code (OBC), latest edition.

Part 2 Products

2.1 MATERIALS

.1 Portland cement: to standards of CSA A3000 normal Type 10.

.2 Slag Cement: to standards of CSA A3000.

.3 Water, fine aggregates, and normal density coarse aggregates: to standards of CSA A23.1-04/A23.2

.4 Air Entraining Admixture: to standards of ASTM C260.

.5 Chemical Admixtures: to standards of ASTM C494/ C494M.

.6 Pozzolanic Mineral Admixtures: to standards of ASTM C1017/C1017M.

.7 Superplasticizing Admixtures: to standards of ASTM C494/C494M.

.8 Concrete Mixes and Materials: to standards CSA A3000.

.9 Granular Base: as per drawings.

.10 Caulking: polysulphide two component base coloured to match granite as required, Plykol by Thornhill Sales Ltd., tested for non-staining of granite. Submit copy of non-staining test report for sealant.

.11 Reinforcing Steel: as per drawings.

2.2 JOINT FILLER:

.1 Expansion joint material should be performed non-extruding and resilient bituminous fibre of 10 mm thick and conform to ASTM D1751.

.2 'Snap-Cap' expansion joint inserts as supplied by Givesco Ottawa or approved equal.

2.3 CONCRETE MIXES

.1 Proportion normal density concrete to CSA-A23.1/A23.2, Clause 14, to give the following properties:

Location	28 Day Strength	Slump* Max.	Slump* Min.	Class of Exposure
Walls and Curbs	35 MPa	75	25	C-1
Pavements	35 MPa	50	25	C-2

.2 Provide certification that plant, equipment, and all materials to be used in concrete comply with requirements of CSA-A23.1/A23.2.

.3 Provide certification that mix proportions selected will produce concrete of specified quality and yield and that strength will comply with CSA-A23.1/A23.2.

.4 Slag cement in combination with normal Portland cement to a maximum of 25% may be used.

.5 Obtain Engineer's consent before using chemical admixtures.

.6 Us of calcium chloride not permitted.

2.4 OPTIONAL GRANULAR FILL

.1 Crushed Limestone 8-12 mm diametre clear.

Part 3 Execution

3.1 SUBGRADE

.1 Check finished subgrade for conformity with elevations and sections and obtain approval from the Construction Manager before placing granular bases.

3.2 GRANULAR BASES

.1 Place granular base to be compacted to depths and elevations shown on drawings.

3.3 FORMWORK

.1 Do formwork in accordance with Section 03 10 00 Concrete Forming and Accessories.

3.4 INSULATION

.1 Place insulation to line thickness and grade shown on drawings.

3.5 REINFORCING STEEL

.1 Place reinforcing steel as indicated on contract drawings.

3.6 CONCRETE PLACEMENT

.1 Place concrete in accordance with the lines, grades, and depths indicated on contract drawings.

3.7 CONCRETE FINISHING

.1 Finish concrete to required levels, in accordance with Section 22 of CSA-A23.1. Carry out test area for review by Consultant, prior to proceeding.

.2 Cure and protect concrete in accordance with Section 21 of CSA-A23.1.

.3 A steel trowel or wood trowel should be used to finish surfaces to provide non-skid surface texture, except where specified otherwise.

.4 Finish surfaces to within 5 mm to 3 m line, level, or grade as measured with a straight edge placed on the surface.

3.8 JOINTS

.1 Joints will be constructed of the type and at locations shown on drawings.

.2 Concrete adjacent to all formwork and joints will be finished smooth with top of form. Edges will be eased with edging tools but no lines will be left on the surface.

.3 Construction joints will be sawcut to line and pattern as shown on drawings, within two days of finishing concrete surface.

.4 Unless otherwise indicated on drawings expansion joints will be placed at area drains and along length adjacent to concrete curbs catchbasins, buildings, or permanent surfaces.

.5 Expansion joints will be for the full depth of the slab.

.6 All joints will be sealed with expansion joint material in accordance with manufacturer's recommendations.

.7 Caulk expansion joints as shown on drawings.

.8 Saw cut expansion joints as indicated on plans and detail drawings.

END OF SECTION

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Part 1 General

1.1 RELATED REQUIREMENTS

.1 Section – 04 05 10 Masonry Procedures

.2 Section 04 05 23 Masonry Accessories

1.2 REFERENCE STANDARDS

.1 ASTM International

.1 ASTM A123/A123M, Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.

.2 ASTM A775/A775M, Standard Specification for Epoxy-Coated Steel Reinforcing Bars.

.3 ASTM D412, Standard Test Methods for Vulcanized Rubber and Thermoplastic Rubbers and Thermoplastic Elastomers - Tension.

.4 ASTM D2240, Standard Test Method for Rubber Property - Durometer Hardness.

.5 ASTM C494/C494M, Standard Specification for Chemical Admixtures for Concrete.

.2 Canada Green Building Council (CaGBC)

.1 LEED Canada-NC-2009, LEED (Leadership in Energy and Environmental Design): Green Building Rating System for New Construction and Major Renovations 2009.

.3 CSA Group (CSA)

.1 CSA A23.1/A23.2, Concrete Materials and Methods of Concrete Construction/Test Methods and Standard Practices for Concrete.

.2 CAN/CSA-A23.3, Design of Concrete Structures.

.3 CSA A23.4, Precast Concrete-Materials and Construction.

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

.5 CSA G30.18, Carbon and Steel Bars for Concrete Reinforcement.

.6 CSA G40.20/G40.21 , General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel.

.7 CSA G279, Steel for Prestressed Concrete Tendons (Metric Version).

.8 CAN/CSA-S6 + S6S1, Consists of CAN/CSA-S6, Canadian Highway Bridge Design Code and S6S1, Supplement #1 to CAN/CSA-S6.

.9 CSA W47.1, Certification of Companies for Fusion Welding of Steel Structures.

.10 CSA W48, Filler Metals and Allied Materials for Metal Arc Welding.

.11 CSA W59, Welded Steel Construction (Metal Arc Welding).

.12 CSA W186, Welding of Reinforcing Bars in Reinforced Concrete Construction.

.4 National Research Council Canada (NRC)

.1 National Building Code of Canada (NBC).

.5 The Master Painters Institute (MPI)

.1 Architectural Painting Specification Manual - [current edition] .

.1 MPI #18 Primer, Zinc Rich Organic.

.2 MPI #79 Primer, Alkyd, Anti-Corrosive for Metal.

.6 Underwriters' Laboratories of Canada (ULC)

.1 CAN/ULC-S701, Standard for Thermal Insulation, Polystyrene, Boards and Pipe Covering.

.7 U.S. Environmental Protection Agency (EPA)/Office of Water

.1 EPA 832/R-92-005, Storm Water Management for Construction Activities: Developing Pollution Prevention Plans and Best Management Practices.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

.1 Submit in accordance with Section 01 33 23 Shop Drawings, Product Data, Samples, Mock-ups and Warranty.

.2 Product Data:

.1 Submit manufacturer's instructions, printed product literature and data sheets for concrete mixes and include product characteristics, performance criteria, physical size, finish and limitations.

.3 Shop Drawings:

.1 Submit shop drawings to CSA A23.4 and CAN/CSA-A23.3.

.2 Submit 1 copy of detailed calculations and design drawings for typical precast elements and connections for Consultant for review 3 weeks prior to manufacture.

.3 Indicate on drawings:

.1 Design calculations for items designated by manufacturer.

.2 Tables and bending diagrams of reinforcing steel.

.3 Camber.

.4 Finishing schedules.

.5 Methods of handling and erection.

.6 Openings, sleeves, inserts and related reinforcement.

.4 Samples:

.1 Produce, deliver and erect where directed by Consultant on project site, [1] full size sample of each type of precast concrete unit showing details, colour, finish and quality for approval of Consultant.

.1 Begin production of precast units after receipt of Consultant written approval.

.5 Submit evidence of welding certification including welding procedures before commencing work.

1.4 QUALITY ASSURANCE

.1 Fabricate and erect precast concrete elements using manufacturing plant certified by CSA Group CSA in appropriate categories to CSA A23.4 .

.2 Only precast elements fabricated in such certified plants to be acceptable to owner, and plant certification to be maintained for duration of fabrication, erection until warranty expires.

.3 Welder Qualification: certified to CSA W47.1 and for weld type required.

1.5 DELIVERY, STORAGE AND HANDLING

.1 Deliver, store and handle materials in accordance with manufacturer's written instructions.

.2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.

.3 Storage and Handling Requirements:

.1 Store materials in dry location, off ground and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.

.2 Store and protect precast units from damage.

.3 Replace defective or damaged materials with new.

1.6 WARRANTY

.1 Contractor hereby warrants that precast architectural elements will not spall or show visible evidence of cracking, except for normal hairline shrinkage cracks, in accordance with CCDC 2 General Conditions GC 12.3, but for 24 months.

Part 2 Products

2.1 MATERIALS

.1 Cement, colouring material, aggregates, water, admixtures: to CSA A23.4 and CSA A23.1/A23.2.

.2 Exposed aggregate: CPCI 101 calcite, white sand with light sandblast finish.

.3 Anchors and supports: to CSA G40.20/G40.21, galvanized.

2.2 Precast Units

.1 Pre-cast concrete elements to include the following (dimensions as per landscape drawings):

.1 Precast concrete pillar coping (quantity: 4)

.2 Precast concrete masonry unit (quantity: 4)

.3 Precast concrete band unit (quantity: 16)

2.3 CONCRETE MIXTURES

.1 Proportion high density concrete in accordance with CSA A23.1/A23.2 to give following properties:

.1 Minimum compressive strength at 28 days: 35 mpa

.2 Class of exposure: F-2

.3 Air content: 3-5%

2.4 GROUT MIXES

.1 Cement grout:

.1 Above grade - Mortar Type N

.1 Minimum compressive strength: 750 psi

.2 Shrinkage compensating grout: to Section 03 30 00- Cast-in-Place Concrete.

2.5 DESIGN REQUIREMENTS

.1 Design precast elements to resist handling, stockpiling, shipping and erection stresses.

.2 Design precast elements to carry loads as indicated, and in accordance with applicable codes and National Building Code of Canada (NBC).

.1 Design to include resistance to creep, shrinkage and temperature effects, and, wind and earthquake loads.

.3 Carry out vibration analysis and test if and as required by Consultant.

.4 Design connections and attachments of precast elements to load and forces as indicated, and in accordance with applicable codes and National Building Code of Canada (NBC).

.1 Connections to be designed to withstand long-term corrosion for exposed elements.

2.6 PERFORMANCE REQUIREMENTS

.1 Tolerance of precast elements: to CSA A23.4.

.2 Length of precast elements not to vary from design length by more than plus or minus 2 mm.

.3 Cross sectional dimensions of precast elements not to vary from design dimensions by more than plus or minus 2 mm.

.4 Deviations from straight lines not to exceed 2 mm.

.5 Precast elements not to vary by more than plus or minus 2 mm.

2.7 FABRICATION

.1 Manufacture units to CSA A23.4.

.2 Mark each precast unit to correspond to identification mark on shop drawings for location with date cast on part of unit which will not be exposed.

.3 Design and attach anchors and inserts to precast concrete elements to carry design loads.

.4 Shop prime anchors after fabrication and touch up primer on anchors after welding. Do not apply primer to embedded portion of anchors or inserts.

.5 Galvanize steel embedments and anchors after fabrication and touch up with zinc-rich primer after welding.

2.8 FINISHES

.1 Finish and colour of precast units to be approved by Landscape Architect.

Part 3 Execution

3.1 GENERAL

.1 Do precast concrete work to CSA A23.4 and CAN/CSA-S6.

3.2 EXAMINATION

.1 Verification of Conditions: verify conditions of substrates previously installed under other Sections or Contracts are acceptable for precast concrete installation in accordance with manufacturer's written instructions.

.1 Inform Consultant of unacceptable conditions immediately upon discovery.

.2 Proceed with installation only after unacceptable conditions have been remedied and after receipt of approval from Consultant.

3.3 ERECTION

.1 Erect precast elements within allowable tolerances as indicated.

.2 Grout underside of unit bearing plates with shrinkage compensating grout.

.3 Fasten precast panels in place as indicated on reviewed shop drawings.

.4 Do not weld or secure bearing plates at sliding joints.

.5 Set units dry, without mortar, attaining specified joint dimension with plastic shims.

.6 Remove shims and spacers from joints of non-load bearing panels after fastening but before sealant is applied.

.7 Apply sealant to precast panels to manufacturer's recommendations unless specified otherwise.

3.4 PROTECTION

.1 Protect installed products and components from damage during construction.

.2 Repair damage to adjacent materials caused by precast concrete installation.

END OF SECTION

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DIVISION 04

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Part 1 General

1.1 RELATED SECTIONS

.1 Section 03 10 00 – Concrete Forming and Accessories

.2 Section 03 20 00 - Concrete Reinforcing

.3 Section 03 30 00 – Cast-In-Place Concrete

1.2 REFERENCE STANDARD

.1 Canadian Standards Association

.2 CSA S304-14 'Design of Masonry Structures'.

1.3 SOURCE QUALITY CONTROL

.1 Submit laboratory test reports certifying compliance of masonry units and mortar ingredients with specification requirements, in accordance with shop drawings.

1.4 PRODUCT SAMPLES

.1 Submit samples as follows:

.1 Two of each type of masonry unit specified;

.2 One of each type of masonry accessory specified;

.3 One of each type of masonry reinforcement and tie proposed for use;

.4 As required for testing purposes.

1.5 PRODUCT DELIVERY, STORAGE AND HANDLING

.1 Deliver materials to the job site in dry condition.

.2 Keep materials dry until use, except where wetting of bricks is specified.

.3 Store under waterproof cover on pallets or plank platforms held off ground by means of plank or timber skids.

1.6 COLD WEATHER REQUIREMENTS

.1 When air temperature is below 5ºC take following precautions in preparing and using mortar:

.1 Heat the sand slowly and evenly. Do not use scorched sand, having a reddish cast, in mortar;

.2 Heat water to 70 ºC maximum; 20 ºC minimum;

.3 After combining heated ingredients maintain temperature of mortar between 5 ºC and 50 ºC until used.

.4 Protect mortar from rain and snow.

.2 Maintain dry beds for masonry and use dry masonry units only. Do not wet masonry units in winter.

1.7 HOT WEATHER REQUIREMENTS

.1 Protect freshly laid masonry from drying too rapidly, by means of waterproof, non-staining coverings.

1.8 PROTECTION

.1 Keep masonry dry using waterproof, non-staining coverings that extend over walls and down sides sufficient to protect walls from wind driven rain, until masonry work is completed and protected by flashings or other permanent construction.

.2 Protect masonry and other work from marking and other damage. Protect completed work from mortar droppings. Use non-staining coverings.

.3 Provide temporary bracing of masonry work during and after erection until permanent lateral support is in place.

Part 2 Products

2.1 MATERIALS

.1 Masonry to CSA S304.

.2 Masonry Veneer: Burned clay brick to CAN/CSA-A82

.1 Supplier: Merkley Supply Ltd. (Ken Merkley 613-728-2693) or approved equal.

.2 Type: FBX

.3 Grade: SW

.4 Size: 190mm x 56mm x 90mm deep (metric modular).

.5 Colour and texture: to match existing Shaw Brick Ltd. “Old Brunswick Colonial (Flashed)” colour range and texture.

Part 3 Execution

3.1 WORKMANSHIP

.1 Build masonry plumb, level, and true to line, with vertical joints in proper alignment.

.2 Layout coursing and bond to achieve correct coursing heights, and continuity of the bond above and below openings, with minimum of cutting.

3.2 TOLERANCES

.1 Pillars: plumb within 1:600

.2 Deviation in joint thickness: 3 mm.

3.3 EXPOSED MASONRY

.1 Remove chipped, cracked, and otherwise damaged units in exposed masonry and replace with undamaged units.

3.4 JOINTING OF WORK

.1 Rake joints uniformly to 6 mm depth and compress with a square tool to provide smooth, compressed, raked joints of uniform depth.

3.5 CUTTING

.1 Cuts should be made straight, clean, and free from uneven edges.

3.6 BUILDING-IN

.1 Build in items required to be built into masonry.

.2 Prevent displacement of built-in items during construction. Check plumb, location and alignment frequently, as work progresses.

3.7 WETTING OF BRICKS

.1 Except for during the winter, wet clay bricks having an initial rate of absorption exceeding 1g/min/1000 mm^2: wet to uniform degree of saturation, 3 to 24 hours before laying bricks, and do not lay until the surface is dry.

.2 Wet tops of walls built of bricks qualifying for wetting, when recommencing work on such walls.

3.8 CONTROL JOINTS

.1 Provide control joints as indicated.

3.9 TESTING

.1 Inspection and testing will be carried out by testing laboratory designated by the Contract Administrator.

END OF SECTION

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Part 1 General

1.1 SECTION INCLUDES

.1 Provide labour, materials, services and equipment necessary to complete the work of this Section, including: Mortar and grout for masonry work.

1.2 RELATED SECTIONS

.1 Section 03 45 00 – Precast Architectural Concrete

.2 Section 04 05 10 – Masonry Procedures

1.3 GENERAL CONDITIONS

.1 Landscape drawings and specifications are to be read together with all relevant engineering documentation. Comply with all requirements of Division One. All work must comply with all pertinent codes and laws established by the municipal, provincial and federal governments and by all other authorities having jurisdiction.

1.4 REFERENCE STANDARDS

.1 ASTM International

.1 ASTM C270-14a ‘Standard Specification for Mortar for Unit Masonry’.

.2 CSA Group

.1 CAN/CSA A179-14 ‘Mortar and Grout for Unit Masonry’.

1.5 DEFINITIONS

.1 Type ‘N’ Type N mortar is suitable for general use in exposed masonry above grade. It is recommended for use in parapet walls, chimneys and exterior walls when subject to severe exposure.

.2 Type ‘M’ mortar is recommended for use in masonry in contact with earth such as foundations, retaining walls, paving, sewers, and manholes, and in reinforced masonry.

.3 Type ‘S’ mortar is a contractor grade mortar mix designed to lay brick, set block, patching, tuck point and stone work.

1.6 SAMPLES

.1 Submit two samples of mortar and coloured mortar of each type used in masonry work.

Part 2 Products

2.1 MATERIALS

.1 Mortar and Grout: conforming to specifications of CSA A179.

.2 Aggregate: passing 1.18 mm sieve where 6 mm thick joints are indicated.

.3 Colour: ground coloured natural aggregates or metallic oxide pigments.

.4 Latex Additive: by Laticrete or Mapei, subject to approval of Engineer.

2.2 MATERIAL SOURCE

.1 Use same brands of materials and source of aggregate for entire project.

2.3 MORTAR TYPES

.1 Mortar for exterior masonry above grade: Type 'S' Masonry Mortar Mix.

.1 Mortar for foundation walls, manholes, sewers, pavements, walks, patios and other exterior masonry at or below grade: Type 'M'.

.2 Following applies regardless of mortar types and uses specified above:

.1 Mortar for Stonework: Type 'N'.

.2 Mortar for Pointing: Type 'S'.

2.4 COLOURED MORTAR

.1 Coloured mortar: use colouring admixture not exceeding 10% of cement content by mass, or integrally coloured masonry cement, to produce coloured mortar to match approved sample.

2.5 NON-STAINING MORTAR

.1 For non-staining mortar use non-staining masonry cement for cementitious portion of specified mortar type.

2.6 GROUT

.1 Grout: to CSA A179.

Part 3 Execution

3.1 MIXING

.1 Carry out masonry mortar and grout work in accordance with CSA A179 except where specified otherwise.

.2 Colour and Admixtures: mix grout to semi-fluid consistency.

.3 Coloured Mortars: incorporate colour and admixtures into mixes in accordance with manufacturer's instructions. Use clean mixer for coloured mortar.

.4 Pointing Mortar: prehydrate the pointing mortar, by mixing the ingredients dry and then mixing it again, adding just enough water to produce damp unworkable mix that will retain its form when pressed into ball.

.5 Allow to stand for not less than 1 hour and no more than 2 hours then remix with sufficient water to produce mortar of proper consistency for pointing.

3.2 Mortar Schedule

.1 Mortar colour to be approved by consultant.

.1 Use non-staining mortar for joints in limestone work.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

.1 Section 04 05 10 – Masonry Procedures

1.2 REFERENCES

.1 Canadian Standards Association (CSA)

.1 CSA-A371-04(R2009) 'Masonry Construction for Building, Includes Updates No. 1,2, and 3 (2007)'.

.2 CSA S304-14 'Design of Masonry Structures'.

1.3 SAMPLES

.1 Before delivery of products to site submit samples for Consultant approval.

Part 2 Products

2.1 Materials

.1 Control Joint Filler: purpose-made elastomer, outsized 30% to 50%, 20 durometer hardness.

.2 Nailing Inserts: 0.6 mm thick purpose made galvanized steel inserts for setting in mortar joints.

.3 Masonry Flashing: Blue skin A/G flexible flashing thickness 1.2 mm as manufactured by Monsey Bakor Inc. 284 Watline Avenue, Mississauga, Ontario L4Z 1P4 Phone: 1(800)-387-9598 Fax: 1(877)890-4866. Bedding and Lap Adhesive: as recommended by manufacturer of flashing material.

.4 Weep Holes: DA1069 Cell Vent by Dur-O-Wal Limited, 200 E. Touhy Avenue, Des Plaines, IL 60018, Phone: 011(847)391-4747 Fax: 011(847)954-4307, to suit cavity thickness.

.5 Mortar Stops: 250 mm high mortar dropping control device to suit cavity thickness as manufactured by Mortar Net USA Ltd. 541 South Lake Street, Gary, IN 46403, USA. Phone: (800)-664-6638, Fax: (219)939-3877.

Part 3 Execution

3.1 CONTROL JOINTS

.1 Install continuous control joint fillers in control joint at locations indicated.

3.2 WEEP HOLE VENTS

.1 Install weep-hole vents in vertical joints immediately over flashings, in exterior widths of cavity wall and masonry veneer wall construction at maximum horizontal spacing of 600 mm o.c.

3.3 NAILING INSERTS

.1 Install nailing inserts in mortar joint at 400 mm o.c. each way, for attachment of wall strapping where required.

3.4 MASONRY FLASHING

.1 Install flashing in masonry in accordance with

.1 CSA S304 and CSA-A371 and as follows:

.2 Install flashing under exterior masonry bearings on foundation walls, slabs, shelf angles, and steel angles over openings. Install flashing at al interruptions to the exterior block veneer. Install flashing under weep-hole courses and as indicated.

.3 Apply adhesive to all surfaces to receive flashings.

.2 Install flashings over all penetrations through the exterior width of the exterior walls.

.3 In double width walls and veneered walls, carry flashings from front edge of masonry, under outer width, then up backing not less than 200 mm and as follows:

.1 For masonry backing embed flashing 25 mm in joint.

.2 For concrete backing, bond flashing to backing using manufacturer's recommended adhesive or embed flashing in preformed reglet.

.3 For gypsum board backing, bond to wall using manufacturer's recommended adhesive.

.4 Lap joints 150 mm and seal with adhesive.

3.5 MORTAR STOPS

.1 Install mortar stop device continuously on top of all through wall masonry flashings in the cavity space.

END OF SECTION

DIVISION 05

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Part 1 General

1.1 Section Includes

.1 Preparation of shop drawings for the construction of metal fencing including footings as indicated on the drawings and details. Supply, installation, and co-ordination of all items as approved on shop drawings.

1.2 RELATED SECTIONS

.1 Section 03 30 00 – Cast-in-Place Concrete

.2 Section 32 11 23 – Aggregate Base Courses

1.3 REFERENCES

.1 Canadian Standards Association

.1 CSA W47.1-09 (R2014) 'Certification of Companies for Fusin Welding of Steel Structures'.

.2 CSA W47.2-11 (R2015) 'Welding of Reinforcing Bars in Reinforced Concrete Construction'.

.3 CSA W55.3-08 (R2013) 'Resistance Welding Qualification Code for Fabrication of Structural Members used in Buildings'.

.4 CSA W59-13 'Welded Steel Construction (Metal Arc Welding').

1.4 INVESTIGATION

.1 Review existing site conditions and assess constraints.

.2 Any discrepancies should be noted and the Contract Administrator notified immediately.

1.5 SHOP DRAWINGS

.1 Submit to Contract Administrator shop drawings for review with reasonable promptness and in an orderly sequence so as not to cause delay in the work. Failure to submit in ample time is not considered sufficient reason for an extension of Contract Time and no claim will be allowed.

.2 Work affected will not proceed until review and approval of shop drawings is complete.

.3 The Contractor will review shop drawings prior to submission. This review represents those necessary requirements of the Work and the Contract Documents.

.4 Verify that field measurements and affected adjacent works are co-ordinated.

.5 The Contractor's responsibility for submission of errors and omissions is not relieved by the submittals review.

.6 Contractor's responsibility for deviations in submission from requirements of Contract Documents is not relieved by the review.

.7 Keep one approved copy of submission on the site.

1.6 SHOP DRAWINGS AND MANUFACTURERS DATA

.1 Requirements to be included:

.1 Shop drawings and product data

.2 Design criteria and design calculations

.2 The term 'shop drawing' means drawings, diagrams, illustrations, schedules, performance charts, brochures and other data provided by the Contractor to illustrate the fence construction.

.3 Indicate materials, construction methods, attachment or anchorage, erection diagrams, connections, explanatory notes and information necessary to complete work. Indicate cross-references to design drawings and specifications.

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

.5 Make changes to shop drawings as requested that are consistent with the Contract Documents. When resubmitting, notify in writing of any revisions other than those requested. Note all revisions on the shop drawings.

.6 Submit two (2) prints of each shop drawing.

.7 Submit two copies of product data sheets or brochures for requirements or as Contract Administrator may reasonably request, where shop drawings will not be prepared due to standardized manufacture of the product.

.8 If upon review, no errors or omissions are discovered of if only minor corrections are made, the transparency copy will be returned, and fabrication and installation may proceed. If shop drawings are rejected, noted copy will be returned and resubmission of corrected shop drawings, through the same procedure indicated above, will be performed before fabrication and installation of work may proceed.

.9 Samples:

.1 Submit for review samples as requested and label samples as to origin and intended use in the work.

.2 Deliver samples prepaid to Consultant's business address.

.3 Make any required changes in any samples as directed by the Contract Administrator.

.10 The Contractor will be required to execute the shop drawings as approved. Any revisions must have written approval prior to commencement of work.

1.7 QUALITY ASSURANCE

.1 Provide a foreman with a minimum of two years' experience, competent and skilled in the work of this section to the performed, and to be present at all times during the performance of this work.

.2 Comply with all local codes relative to the installation of the work of this section. Additionally, comply with any constraints the Owner may have to maintain secured grounds.

.3 Do weld work in accordance with CSA W59 unless specified otherwise.

.4 All welding under this section will be executed by welders approved by the Canadian Welding Bureau to requirements of CSA W47.1, CSA W47.2, and CSA W55.3.

1.8 WARRANTY AND GUARANTEED MAINTENANCE

.1 The Contractor will guarantee all parts, materials, and workmanship for period of one year from the date of final acceptance. The Contractor will repair or replace, any defective materials, parts or work appearing during the one-year warranty period. Such repair work will have a one-year warranty effective at the time of repair for a one-year warranty period. The Contractor will furnish a written warranty for custom work and a copy of manufacturer's warranties at the completion of the project.

Part 2 Products

2.1 METAL FENCE

.1 Metal Fence:

.1	Manufacturer:	Iron Eagle Industries, 1256 Cardiff Boulevard, Mississauga, Ontario, Canada L5S 1R1 1(905) 670-2558 or approved equivalent.
.2	Product:	Iron Eagle II Series, Canadian Eagle II
.3	Panel Height:	1524mm
.4	Material:	Aluminum
.5	Colour:	Black
.6	Post caps:	Pyramid
.7	Hardware:	Supply and install all required hardware

.2 Metal Pedestrian Gate:

.1	Manufacturer:	Iron Eagle Industries, 1256 Cardiff Boulevard, Mississauga, Ontario, Canada L5S 1R1 1(905) 670-2558 or approved equivalent.
.2	Product:	Gates to match Iron Eagle II Series, Canadian Eagle II fencing, self-closing gates.
.3	Colour:	Black
.4	Hardware:	Supply and install all required hardware including self closing hinges and drop pins for fully functioning gate operation
.5	Sizes:	Height to match fencing. 1500mm minimum clear opening width

.3 Metal Vehicular Gate:

.1	Manufacturer:	Iron Eagle Industries, 1256 Cardiff Boulevard, Mississauga, Ontario, Canada L5S 1R1 1(905) 670-2558 or approved equivalent.
.2	Product:	Gates to match Iron Eagle II Series, Canadian Eagle II fencing, self-closing gates.
.3	Colour:	Black
.4	Hardware:	Supply and install all required hardware including self closing hinges and drop pins for fully functioning gate operation
.5	Sizes:	Height to match fencing. 6000mm total minimum clear opening width (double gate), refer to drawings.

2.2 FABRICATION

.1 Fabricate all metal furnishings and material sizes and dimensions as indicated on reviewed shop drawings.

.2 Ensure all connections and assemblies are tight, secure, and finished such that corrosion does not take place.

.3 Cap/finish all exposed ends.

Part 3 Execution

3.1 SITE EXAMINATION

.1 Examine areas where system is to be installed. Conditions resulting in a poor installation will be reported prior to commencement of work.

.2 Any minor ground undulations interfering with the construction of the fence shall be levelled prior to commencement of work.

3.2 FENCE ERECTION

.1 Erect the fabricated fence and railing plumb, straight and true and accurately fitted, with tight joints and intersections, as approved on the shop drawings.

.2 Remove all rough edges, splits, and projects from exposed surfaces. Refinish as required.

.3 Touch up field welds, burnt or scratched surfaces after completion of erection with zinc primer, prior to painting.

END OF SECTION

DIVISION 09

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Part 1 General

1.1 RELATED SECTIONS

.1 Section 05 50 10 – Metal Fencing

.2 Section 32 31 13 – Chain-link Fences and Gates

1.2 REFERENCES

.1 Canadian General Standards Board (CGSB)

.1 CAN/CGSB-85.10-99 ‘Protective Coatings for Metals’.

.2 CAN/CGSB-1.153-2000 ‘High-Build, Gloss Epoxy Coating’.

.3 CAN/CGSB-1.177-M91 ‘Two-Component Polyurethane Coating, Resistant to Chalking and Yellowing’.

.2 The Society for Protective Coatings (SSPC)

.1 SSPC-SP 1 ‘Solvent Cleaning’.

.2 SSPC Guide 7 ‘Guide to the Disposal of Lead-Contaminated Surface Preparation Debris’.

.3 Steel Structures Painting Council, ‘System and Specifications’, 5th Edition, 1989.

.4 DFT (dry film thickness).

1.3 ENVIRONMENTAL PROTECTION

.1 Do not apply paint finish in areas where dust is being generated.

.2 Minimum temperature for painting, 10°C, or as specified by paint manufacturer.

.3 Surfaces must be dry, clean, and free from dust, grease, oil or other contaminants, which will affect the work of this section.

1.4 DELIVERY, STORAGE

.1 Deliver packaged materials in original, unopened, labelled, and sealed containers.

.2 Keep stored materials covered at all times and take necessary precautions against fire.

1.5 PROTECTION

.1 Use sufficient drop cloths and protective coverings to protect floors, furnishings, and work of other not being painted.

.2 Areas assigned for storage and preparation of materials shall be fully protected.

.3 Keep waste rags in metal drums containing water and remove from building at end of each working shift.

.4 Protect work during painting and drying, from direct sunlight and winds.

1.6 QUALITY ASSURANCE

.1 Painting shall be in accordance with System and Specifications, Fifth Edition, 1989.

.2 CGSB Standard for: Painting Galvanized Steel to CAN/CGSB-85.10-99.

Part 2 Products

2.1 PAINT SYSTEM

.1 Environmental conditions: moderate to severe exterior exposure.

.2 Colour to match proposed black vinyl chain link fencing.

.3 All components of paint coating system by single manufacturer.

.4 Paint System: Contractor to specify paint method prior to commencement of work.

Part 3 Execution

3.1 SCOPE

.1 The work covered under this section includes the surface preparation and the supply and the application of coatings including but not limited to the following:

.1 All metal elements as indicated on drawings.

3.2 INSPECTIONS

.1 Report to the Landscape Architect in writing those surfaces not in proper condition for covering and other conditions liable to adversely affect the finished appearance or performance of the coating systems and which cannot be put into acceptable condition by the work specified herein.

.2 Failure to make such inspection and report, or the covering of defective work, will in either event entail re-executing the work affected without additional cost to the owner.

.3 Do not proceed with surface preparation and application until the surface is acceptable, or authorization to proceed is given by the Landscape Architect.

3.3 SURFACE PREPARATION

.1 Ensure all surfaces that are to be coated are dry, clean, and free of frost, dust, dirt, oil, grease or other contaminates immediately prior to painting.

.2 Sandblast all metal surfaces to remove rust.

.3 Prepare galvanized steel surfaces to CAN/CGSB-85.10-99. No Solvent Cleaning.

3.4 APPLICATION

.1 Comply with the recommendations and directions of the manufacturer whose materials are being used.

.2 Apply special coatings as specified DFT (dry film thickness) in strict accordance with the Coating Manufacturer’s printed instructions.

.3 Finish and number of coats are intended to cover surfaces completely.

.4 Apply materials in strict accordance with manufacturer’s directions and specifications and be familiar with those directions and specifications. Do not use adulterants.

.5 Paint shall be uniform in sheen, colour, and texture matching, free from brush or roller marks, sags, runs or other defects.

END OF SECTION

DIVISION 31

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Part 1 General

1.1 SECTION INCLUDES

.1 Work under this section shall include, but not necessarily be limited to, supply and install of subgrade material and re-contouring of site as required prior to topsoil application or planting bed preparation.

1.2 RELATED SECTIONS

.1 Section 02 41 13.15 – Site Work, Demolition and Removals

.2 Section 32 11 23 – Aggregate Base Courses

.3 Section 32 91 19.13 – Topsoil Placement and Grading

1.3 REFERENCES

.1 American Society for Testing and Materials (ASTM)

.1 ASTM D698-12e2 'Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12 400 ft-lbf/ft^3 (600 kN-m/m^3))'.

.2 Underwriters Laboratories of Canada (ULC)

1.4 EXISTING CONDITIONS

.1 All underground surface utility lines and other buried objects should be shown on site plan where data is available. If data is unreliable or incomplete, the Contractor must establish these locations before commencing work.

.2 Known underground and surface utility lines and buried objects are as indicted on site plan.

.3 Refer to dewatering in Section 31 23 33.01 Excavating, Trenching and Backfilling.

.4 Refer to detailed installation of catch basins and manholes and other drainage requirements.

1.5 PROTECTION

.1 Prevent damage to landscaping, bench marks, existing buildings, existing pavements, surfaces, underground utility lines that are to remain, as directed. If damaged, restore to original condition or better unless otherwise directed.

.2 Maintain access roads to prevent accumulation of mud on roads.

Part 2 Products

2.1 MATERIALS

.1 Imported subgrade material to be tested and results submitted to the Consultant for review prior to delivery to site.

.2 Excavated or graded material existing on site is suitable to use as fill for grading work if approved by Consultant.

.3 Consultant must approve grading work, before proceeding. Protect such approved material from any contamination.

Part 3 Execution

3.1 STRIPPING OF TOPSOIL

.1 Do not handle topsoil while in wet or frozen condition or in a manner in which soil structure is adversely affected as determined by the Consultant.

.2 Commence topsoil stripping of areas as directed by Consultant after area has been cleared of brush, weeds, and grasses and removed from site.

.3 Strip topsoil to depths as directed. Avoid mixing topsoil and subsoil.

3.2 GRADING

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

.2 Rough grade to the following depths below finished grades:

.1	200	mm for maintenance edge
.2	100	mm for grassed areas
.3	300	mm for flowerbeds
.4	450	mm for shrub beds
.5	(as per details)	mm for asphalt or gravel paving
.6	(as per details)	mm for concrete paving, walks or precast paving units.

.3 Slope rough grade away from building 1:50 minimum.

.4 Grade ditches 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 Compact filled and disturbed areas to Standard Proctor Density to ASTM D698 as follows:

.1	85%	under landscaped areas
.2	95%	under paved and walk areas

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

3.3 SOURCE QUALITY CONTROL

.1 Pre-Installation Meetings: conduct pre-installation meeting to verify project requirements, installation instructions, and warranty requirements.

.2 An independent testing laboratory will carry out inspection and testing of topsoil. Contractor will pay for costs of tests.

.3 Test topsoil from source for clay, sand, and silt, Nitrogen (N), phosphorous (P), potassium (K) and magnesium (Mg), (N, P, K, Mg,) soluble salt content, pH value, growth inhibitors, soil sterilants organic matter, and conductivity. Submit 0.5 kg a sample of topsoil to a testing laboratory and indicate present use, intended use, type of subsoil and quality of drainage. Prepare and ship the sample in accordance with provincial regulations and testing laboratory requirements.

.4 Determine required limestone treatment to bring pH value of soil ranges between 5.5 to 7.5 levels.

.5 Submit two copies of soil analysis and recommendations for corrections to Consultant.

3.4 SURPLUS MATERIAL

.1 Remove surplus material and material unsuitable for fill, grading or landscaping from site as directed by Consultant.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

.1 Section 01 35 43 – Environmental Procedures

.2 Section 32 11 23 – Aggregates Base Courses

1.2 REFERENCES

.1 Ontario Provincial Standards

.1 OPSS.MUNI 206 – Construction Specification for Grading

.2 OPSS.MUNI 510 – Construction Specification for Removal

.2 ASTM International

.1 ASTM C117-17, 'Test Method for Material Finer than 0.075mm (No. 200) Sieve in Mineral Aggregates by Washing'.

.2 ASTM C136/C136M14, 'Method for Sieve Analysis of Fine and Coarse Aggregates'.

.3 ASTM D422-63(2007)e2, 'Standard Test Method for Particle-Size Analysis of Soils'.

.4 ASTM D698-12e2,'Standard Test Method for Laboratory Compaction Characteristics of soil using Standard Effort (12,400 ft-lbf/ft^3) (600kN-m/ m^3))'.

.5 ASTM D1557-12e1, 'Standard Test Method for Laboratory Compaction Characteristics of Soil using Modified Effort (56,000 ft-lbf/ft^3 (2,700 kN-m/m^3))'.

.6 ASTM D4318-17, 'Standard Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils'.

.3 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'.

.4 CSA Group

.1 CSA A23.1-14/A3.2-14, 'Concrete Materials and Methods of Concrete Construction/Methods of Test for Concrete, Includes Update No.1 (2015)'.

1.3 DEFINITIONS

.1 Excavation classes:

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

.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.

.2 Unsuitable Materials:

.1 Weak and compressible materials under excavated areas.

.2 Frost susceptible materials under excavated areas.

.3 Frost susceptible materials: fine grained soils with plasticity index less than 10 when tested to ASTM D4318, and gradation within limits specified when tested to ASTM D422-63, and ASTM C136-06: Sieve sizes to CAN/CGSB-8.2.,

Sieve Designation	% Passing
2.00 mm	100
0.10 mm	45-100
0.02 mm	10-80
0.005 mm	0-45

.4 Coarse-grained soils containing more than 20% by mass passing 0.075mm sieve.

1.4 PROTECTION OF EXISTING FEATURES

.1 Existing Buried Utilities and Structures:

.1 Size, depth and location of existing utilities and structures as indicated are for guidance only. Completeness and accuracy are not guaranteed.

.2 Prior to commencing excavation work, notify applicable owner or authorities having jurisdiction, establish location and state of use of buried utilities and structures. Owners or authorities having jurisdiction to clearly mark such locations to prevent disturbance during work.

.3 Prior to commencing work confirm locations of all buried utilities by careful test excavations. Where interferences are anticipated advise the engineer prior to proceeding.

.4 Maintain and protect from damage, water, sewer, gas, electric, telephone and other utilities and structures encountered.

.5 Where utility lines or structures exist in area of excavation, obtain direction from Engineer before removing or re-routing.

.6 Record location of maintained, re-routed, and abandoned underground lines.

.7 Notify immediately appropriate authority in case of damage to any utility during excavation.

Part 2 Products

2.1 MATERIALS

.1 Fill: selected material from excavation or other sources, approved by Engineer for use intended, unfrozen and free from rocks larger than 50mm, cinders, ashes, sods, refuse or other deleterious materials

Part 3 Execution

3.1 SITE PREPARATION

.1 Remove obstructions, ice and snow, from surfaces to be excavated within limits indicated.

.2 Provide temporary erosion and sedimentation control measures as per Section 01 35 43 – Environmental Procedures.

3.2 STRIPPING OF TOPSOIL

.1 Topsoil stripping will not be required as part of this contract.

.2 Contaminated excavation and debris are to be disposed of off-site using licenses haulers and disposal sites.

3.3 EXCAVATION

.1 Advise Engineer at least 7 days in advance of excavation operations for initial cross sections to be taken.

.2 Excavate to lines, grades, elevations, and dimensions as indicated on Contract Drawings.

.3 Dispose of surplus and unsuitable excavated material off site, following approved procedures for hauling and disposal.

.4 Do not obstruct flow of surface drainage or natural watercourses.

.5 Earth bottoms of excavations to be undisturbed soil, level, free from loose, soft, or organic matter.

.6 Notify Engineer when bottom of excavation is reached.

.7 Obtain Engineer approval of completed excavation.

.8 Remove unsuitable material from trench bottom to extent and depth as directed by Engineer.

.9 Correct unauthorized over-excavation as follows:

.1 Fill under bearing surfaces and footings with concrete specified for footings.

.2 Fill under other areas with Type 3 fill compacted to not less than 95% of corrected maximum dry density.

.10 Hand trim, make firm and remove loose material and debris from excavations. Where material at bottom of excavation is disturbed, compact foundation soil to density at least equal to undisturbed soil. Clean out rock seams and fill with concrete mortar or grout to approval of Engineer.

3.4 FILL TYPES AND COMPACTION

.1 Use fill of types as indicated or specified below. Compaction densities are percentages of maximum densities obtained from ASTM D698-07e1, corrected maximum dry density.

.1 Under concrete slabs: provide 100mm compacted thickness base course of Type 1 fill to under-side of slab. Compact base course to 100%.

3.5 BEDDING AND SURROUND OF UNDERGROUND SERVICES

.1 Place and compact granular material for bedding and surround of underground services as per City of Ottawa standard details.

.2 Place bedding and surround material in unfrozen condition.

3.6 BACKFILLING

.1 Do not proceed with backfilling operations until Engineer has inspected and approved installations.

.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, contains ice, snow or debris.

.4 Place backfill material in uniform layers not exceeding 150 mm compacted thickness. Compact each layer before placing succeeding layer.

.5 Backfill around installations. Place bedding and surround material as specified elsewhere.

.6 Install drainage filter system in backfill as indicated by Engineer.

3.7 RESTORATION

.1 Upon completion of work, remove waste materials and debris; trim slopes, and correct defects as directed by Engineer.

.2 Replace topsoil as indicated by Engineer.

.3 Clean and reinstate areas affected by work as directed by Engineer.

3.8 DEWATERING

.1 Keep excavations free of water while Work is in progress.

.2 Provide for Contract Administrator's approval details of proposed dewatering or heave prevention methods, including pumping, dikes, well points, and sheet pile cut-offs.

.3 Avoid excavation below groundwater table if quick condition or heave is likely to occur.

.4 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.

.6 Dispose of water in accordance with Section 01 35 43 - Environmental Procedure in a manner not detrimental to public and private property, or portion of Work completed or under construction.

.7 Provide flocculation tanks, settling basins, or other treatment facilities to remove suspended solids or other materials before discharging to storm sewers, watercourses or drainage areas.

END OF SECTION

DIVISION 32

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Part 1 General

1.1 SECTION INCLUDES

.1 This work item includes the installation of snow fences to protect existing trees from damage during construction and methods to be used for compensation due to damage.

1.2 RELATED SECTIONS

.1 Section 32 91 19.13 – Topsoil Placement and Grading

Part 2 Products

2.1 SOURCE QUALITY CONTROL

.1 Obtain approval from Contract Administrator of new plant material at source prior to planting.

.2 Imported plant material must be accompanied with necessary permits and import licenses. Conform to federal and provincial regulations.

.3 **Emerald Ash Borer**: (Agrilus planipennis Fairmaire)

.1 NO Ash trees or products, including mulch will be allowed on site.

.4 Any fertilizing of plant material applied on site, cannot contain more than 1% of phosphates (P205) by weight, unless it is during the first year, in which turf or managed grasses have been established (either by seed or sod).

2.2 MATERIALS

.1 Any fertilizing of plant material applied on site, cannot contain more than 1% of phosphates (P205) by weight, unless it is during the first year, in which turf or managed grasses have been established (either by seed or sod).

.2 Tree Protection Fence: Tenax, Economy Snow Fence, orange (or approved equal).

.3 Modular Construction Barrier: Modu-loc, 1800mm height, metal fence panels (or approved equal). Posts shall be securely anchored to the ground.

Part 3 Execution

3.1 IDENTIFICATION AND PROTECTION

.1 Identify plants and limits of root systems to be preserved to the satisfaction of the Contract Administrator.

.2 Protect plant and root systems from damage, compaction, and contamination resulting from construction to the satisfaction of the Contract Administrator.

3.2 ROOT PRUNING

.1 In locations where the grade will be lower than the adjacent existing trees, the Contractor will expedite the work of this section to reduce the exposure of the root system.

.2 Cut roots over 12 mm in diameter with a clean pruning instrument. Do not paint.

.3 Any exposed roots more than 12 mm that will be exposed longer than 48 hours, before backfilling will be covered with a landscape fabric and watered daily.

.4 Selectively remove tree branches to reduce transpiration and compensate for damage to root system. Receive approval of branches to be removed by Contract Administrator before commencement of work.

.5 Do not remove more than one-third of the total branching at a single operation.

3.3 MAINTENANCE DURING WARRANTY PERIOD

.1 From time of acceptance by the Contract Administrator to end of warranty period, do the following maintenance operations.

.1 Water plants to maintain soil moisture conditions for optimum growth and health of plant material without causing erosion to the soil.

.2 Apply pesticides according to 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 Contract Administrator before application.

.3 Apply fertilizer in early spring at the rate of 0.025 kg of nitrogen/m^2 or manufacturer's suggested rate.

.4 Remove dead, broken, or hazardous branches from plant material. Dispose of debris.

3.4 DAMAGES

.1 The Contractor will compensate the client for any trees damaged by the Contractor during construction.

.2 Damages will include:

.1 Any physical damage on tree bark;

.2 Any broken branches;

.3 Equipment and materials stored within the protected areas and beyond the limits of the contract.

.4 Refuelling of equipment within the protected areas.

.3 The Contractor will supply, install, maintain, and warranty trees of the same species to every one tree damaged, as indicated by the Contract Administrator:

.1 Coniferous Trees: 2.1 metre height

.2 Deciduous Trees: 70 mm cal.

.4 In addition the Owner reserves the right to charge the Contractor a maximum of $1,000 (one thousand dollars) per damaged tree should the Contractor not comply with directions from the Contract Administrator to protect existing trees.

.5 The exact location of the replacement trees will be staked out to the approval of the Contract Administrator before commencement of work.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

.1 Section 31 22 13 – Rough Grading

.2 Section 32 11 23 – Aggregate Base Courses

1.2 REFERENCES

.1 Ontario Provincial Standard Specifications

.1 OPSS.MUNI 1010 Form 'Material Specification for Aggregates – Base, Subbase, Select Subgrade, and Backfill Material'.

Part 2 Products

2.1 MATERIALS

.1 Granular sub-base material to be free draining granular 'B', crusher run stone (0-50 mm) with no more than 5% passing a 75 um (U.S. No. 200) sieve. Meet requirements of OPSS.MUNI 1010 Form.

Part 3 Execution

3.1 INSPECTION OF EXISTING SUB-GRADE SURFACE

.1 Do not place granular sub-base until finished sub-grade is inspected and approved.

3.2 PLACING

.1 Place material only on a clean unfrozen surface, properly shaped and compacted and free from snow or ice.

.2 Begin spreading subbase material on a crown line or high side of a one-way slope.

.3 Place granular subbase materials using methods, which do not lead to segregation or degradation.

.4 Place material in uniform layers not exceeding 200 mm when compacted or to such other depth as approved.

.5 Shape each layer to a smooth contour and compact to specified density before the succeeding layer is placed.

.6 Remove and replace portion of a layer in which material has become segregated during spreading.

3.3 COMPACTION

.1 Compact to a density as recommended in soils report.

.2 Shape and roll alternately to obtain a smooth, even and uniformly compacted subbase.

.3 Apply water as necessary during compaction to obtain specified density. If subbase is excessively moist, aerate by scarifying with suitable equipment until moisture content is corrected.

.4 In areas not accessible to rolling equipment, compact to specified density with approved mechanical tampers.

.5 Correct surface irregularities by loosening and adding or removing material until surface is within specified tolerance.

3.4 PROOF ROLLING

.1 For proof rolling use a roller of 45,400 kg gross mass with four pneumatic tires each carrying 11,350 kg and inflated to 620 kpa. Four tires arranged abreast with centre-to-centre spacing of 915 mm maximum.

.2 Consultant may authorize use of other acceptable proof rolling equipment.

.3 Proof roll at level in subbase indicated. If alternative proof rolling equipment is authorized, Consultant will determine level of proof rolling.

.4 Make sufficient passes with proof roller to subject every point on surface to three separate passes of a loaded tire.

.5 Where proof rolling reveals areas of defective sub-grade:

.1 Remove subbase and subgrade material to depth and extent directed.

.2 Backfill excavated subgrade with approved common material and compact in accordance to soils report.

.3 Replace subbase material and compact.

.6 Where proof rolling reveals areas of defective subbase, remove and replace in accordance with this section at no extra cost.

3.5 SITE TOLERANCES

.1 Finish compacted surface to within ±25 mm of grade but not uniformly high or low.

.2 Correct surface irregularities by loosening and adding or removing material until surface is within specified tolerances.

3.6 PROTECTION

.1 Maintain finished subbase in condition conforming to this section until succeeding base is constructed, or until granular subbase is accepted by Consultant

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

1.2 DELIVERY, STORAGE AND HANDLING

.1 Deliver and stockpile minimum 50% of total aggregate required prior to commencing operation.

.2 Store cement in weather tight bins or silos that provide protection from dampness and easy access for inspection and identification of each shipment.

1.3 REFERENCES

.1 ASTM International

.1 ASTM C117-13 'Standard Test Method for Materials Finer than 75-microm (No. 200) Sieve in Mineral Aggregates by Washing'.

.2 ASTM C131/C131M-14 'Standard Test Method for Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine'.

.3 ASTM D698-12e2, 'Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400ft-lbf/ft^3) (600kN-m/m^3)'.

.2 Ontario Provincial Standards Specifications (OPSS)

.1 OPSS.MUNI 1010, 'Material Specification for Aggregates – Base, Subbase, Select subgrade, and Backfill Material'.

Part 2 Products

2.1 MATERIALS

.1 Granular base: Granular 'A' to meet requirements of OPSS.MUNI 1010

2.2 INSPECTION OF EXISTING FINISHED SUBGRADE SURFACE

.1 Do not place granular base until subbase or rigid insulation is inspected and approved by Consultant.

2.3 SEQUENCE OF OPERATION

.1 Begin spreading base material on a crown line or high side of a one-way slope.

.2 Place granular base materials using methods, which do not lead to segregation or degradation.

.3 Place material in uniform layers not exceeding 150 mm when compacted or to such other depth as approved.

.4 Shape each layer to a smooth contour and compact to specified density before the succeeding layer is placed.

.5 Remove and replace portion of a layer in which material has become segregated during spreading.

2.4 COMPACTION EQUIPMENT

.1 Compaction equipment to be capable of obtaining required material densities.

2.5 COMPACTING

.1 Shape and roll alternately to obtain a smooth, even and uniformly compacted base.

.2 Apply water as necessary during compaction to obtain specified density. If material is excessively moist, aerate by scarifying with suitable equipment until moisture content is corrected.

.3 In areas not accessible to rolling equipment, compact to 98% S.P.D. with approved mechanical tampers.

2.6 PROOF ROLLING

.1 For proof rolling use standard roller of 45400 kg gross mass with four pneumatic tires each carrying 11350 kg and inflated to 620 kPa. Four tires arranged abreast with centre-to-centre spacing of 730 mm.

.2 Obtain approval from Contract Administrator to use non-standard proof rolling equipment.

.3 Proof roll top of base upon completion of fine grading and compaction.

.4 Make sufficient passes with proof roller to subject every point on surface to three separate passes of a loaded tire.

.5 Where proof rolling reveals areas of defective base or subbase, remove defective materials to depth and extent directed and replace with new materials in accordance with this section at no extra cost. Repeat until all defective areas are rectified.

2.7 SITE TOLERANCES

.1 Finish compacted surface to within ± 10 mm of established grade but not uniformly high or low.

.2 Correct surface irregularities by loosening and adding or removing material until surface is within specified tolerances.

2.8 PROTECTION

.1 Maintain finish base in a condition conforming to this section until succeeding material is applied or until acceptance.

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

.1 The work specified under this section will include but not necessarily be limited to the relocation of existing chain link fence fabric, rails, bars, etc. and installation of new fence posts, fabric, gates, and fittings necessary to provide a secured site.

1.2 RELATED SECTIONS

.1 Section 03 30 00 – Cast-in-Place Concrete

.2 Section 09 97 19 – Painting Exterior Metal Surfaces

.3 Section 31 22 13 – Rough Grading

1.3 MEASUREMENT PROCEDURES

.1 Payment shall be made at measured linear metres of chain link fence installed.

.2 Payment shall be at the contract unit price and shall be full compensation for all labour, equipment, and materials required to perform the work of this section.

1.4 REFERENCE STANDARDS

.1 ASTM International

.1 ASTM A53/A53M-12, ‘Standard Specification for Pipe, Steel, Black and Hot Dipped, Zinc-Coated, Welded and Seamless’.

.2 ASTM A90/A90M-13, ‘Standard Test Method for Weight [Mass] of Coating on Iron and Steel Articles with Zinc or Zinc-Alloy Coatings’.

.3 ASTM A653/A653M-15, ‘Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process’.

.2 Canadian General Standards Board (CGSB)

.1 CAN/CGSB-138-1-96, ‘Fabric for Chain Link Fence.

.2 CAN/CGSB-138.2-96, ‘Steel Framework for Chain Link Fence’, galvanized steel pipe’.

.3 CAN/CGSB-138.3-96 ‘Installation of Chain Link Fence’.

.4 CAN/CGSB 1.181-99 ‘Ready-Mixed Organic Zinc-Rich Coating’.

.3 CSA Group

.1 CSA A23.1-14/A23.2-14 ‘Concrete Materials and Methods of Concrete Construction/Methods of Test for Concrete’.

.2 CAN/CSA-G164-M92 (R2003), ‘Hot Dip Galvanizing of Irregularly Shaped Articles’.

.3 CSA-A3000-13 ‘Cementitious materials Compendium (Consists of A5-98, A8-98, A23.5-98, A362-98, A363-98, A456.1-98, A456.2-98, A456.3-98)’.

Part 2 Products

2.1 MATERIALS

.1 Tubular concrete forms, round, spirally wound laminated fibre forms internally treated with release material.

.2 Concrete: concrete mix designed to produce 35 Mpa minimum compressive strength, at 28 days and containing 20 mm maximum size, 5 mm minimum sizes coarse aggregate, with a water/cement ratio to CSA-A23.1/A23.2 exposure, and 60 mm slump at time and point of deposit.

.3 Air entrainment to CSA-A23.1/A23.2.

.4 Salvage existing chain link fence fabric, rails, tension wire, tie wire fasteners, and tension bars.

.5 Chain Link Fence Fabric: 1.5 m heights; 9 gauge galvanized wire core with black vinyl coating to provide a total of 6 gauge thickness.

.6 Posts, Braces and Rails: to CAN/CGSB-138.2.

.7 Bottom Tension Wire: a single strand galvanized steel wire, 5 mm in diameter.

.8 Gate Frames: to ASTM A53/A53M galvanized steel pipe, standard weight 45 mm outside diameter pipe for outside frame, 35 mm outside diameter pipe for interior bracing.

.1 Fabricate gates as indicated with electrically welded joints, and galvanized after welding.

.2 Fasten fence fabric to gate with a twisted selvage at top.

.3 Furnish gates with galvanized steel hinges, latch and latch catch with provision for padlock, which can be attached and operated from either side of installed gate.

.9 Fittings and Hardware: galvanized steel. Post caps to provide waterproof fit, to fasten securely over posts and to carry top rail.

2.2 FENCES FINISHES

.1 All chain link fencing fabric to be black vinyl.

.2 All posts, rails, and other hardware to be black electrostatic painted.

Part 3 Execution

3.1 SCHEDULING

.1 The Contractor will ensure the site is secured at the end of each working day.

3.2 GRADING

.1 Remove debris and correct ground undulations along fence line to obtain smooth uniform gradient between posts. Provide clearance between bottom of fence and ground surface neither less than 30 mm nor more than 50 mm.

3.3 ERECTION OF FENCE

.1 Erect the fence along lines indicated and in accordance with CAN/CGSB-138.3.

.2 Excavate postholes to manufacturer’s dimensions indicated by methods approved by Consultant. Bulb the bottom of holes for corner and end posts, and for straining posts along fence line.

.3 Space line posts 3.0 m apart, measured parallel to the ground surface.

.4 Space the straining posts at equal intervals, not exceeding 150 m if the distance is greater than 150 m between end and corner posts on straight continuous lengths of the fence over a reasonably smooth grade.

.5 Install corner post where change in alignment exceeds 10º.

.6 Install end posts at the end of fence and at buildings.

.7 Place concrete in post holes for straining posts, end posts and corner posts then embed posts into concrete to depths specified by the manufacturer. Extend concrete 50 mm above ground level and slope to drain away from posts. The brace to hold posts in plumb position and true to alignment and elevation until concrete has set.

.8 Do not install fence fabric until concrete has cured a minimum of 5 days.

.9 Install caps.

.10 Install top rail between posts and fasten securely to terminal posts and secure waterproof caps.

.11 Install bottom tension wire, stretch tightly and fasten securely to end, corner, gate and straining posts with turnbuckles and tension bar bands.

.12 Lay out fence fabric. Install fabric to outside face of posts and rails. Stretch tightly to tension recommended by manufacturer and fasten to end, corner, and straining posts with tension bar secured to post with tension bar bands spaced at 300 mm intervals. The knuckles are to be selvage at the bottom and twisted selvage at the top.

.13 Secure fabric to top rails, line posts, and bottom tension wire with tie wires at 450 mm intervals. Give tie wires minimum two twists.

3.4 INSTALLATION OF GATES

.1 Install gates in locations as indicated.

.2 Level the ground between gateposts and set gate bottom approximately 100 mm above ground surface.

.3 Install gate stops where indicated.

3.5 TOUCH-UP

.1 Repair damaged galvanized surfaces. Clean damaged surfaces with wire brush removing loose and cracked coatings. Apply two coats of approved zinc pigmented paint to damaged areas.

3.6 CLEANING

.1 Clean and trim areas disturbed by operations. Dispose of surplus excavated material and replace damaged sod as directed.

END OF SECTION

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Part 1 General

1.1 RELATED SECTIONS

.1 Section 31 22 13 – Rough Grading

.2 Section 32 01 90.33 – Tree Preservation

1.2 REFERENCES

.1 Canadian Council of Ministers of the Environment (CCME).

CCME PN 1340 'Guidelines for Compost Quality' issued January 1996 (Revision 2005), Category (A) unrestricted, Category (B) restricted.'

1.3 SOURCE QUALITY CONTROL

.1 Pre-Installation Meetings: conduct pre-installation meeting to verify project requirements, installation instructions and warranty requirements.

.2 An independent testing laboratory will carry out inspection and testing of topsoil. Contractor will pay for costs of tests.

.1 Contractor shall provide written documentation demonstrating that they have fulfilled the following requirements, including:

.1 Analysis of the following items, and

.2 Confirmation that the soils meet the requirements of the Ontario Ministry of the Environment and Climate Change.

.2 Test soils from source for clay, sand, and silt, Nitrogen (N), phosphorous (P), potassium (K) and magnesium (Mg), (N, P, K, Mg,) soluble salt content, pH value, growth inhibitors, soil sterilants organic matter, and conductivity. Submit 0.5 kg a sample of topsoil to a testing laboratory and indicate present use, intended use, type of subsoil and quality of drainage. Prepare and ship the sample in accordance with provincial regulations and testing laboratory requirements.

.3 Representative soil samples to be tested by an accredited analytical laboratory to determine the concentrations of any contaminants that may reasonably be expected to be present in the soil.

.4 Typical contaminant parameters shall include metals, polycyclic aromatic hydrocarbons (PAHs), petroleum hydrocarbons (PHCs), and organochloride pesticides. Any additional contaminant parameters to be tested shall be identified by the Qualified Person based on the historic or present use of the property, from which the topsoil is sourced, any potentially contaminating activities that may have taken place thereon, or known environmental conditions that may impact the quality of the topsoil.

.5 The results of the testing shall be compared to the appropriate Site Condition Standards established by the Ontario Ministry of the Environment and Climate Change as provided in the *Ontario Soil, Ground Water and Sediment Standards for Use under Part XV.1 of the Environmental Protection Act* dated April 15, 2011 and as may be amended from time to time and in effect at the time the soil is imported. The Site Condition Standards shall be those applicable to the receiving property as determined based on ground water use, soil texture and land use.

.6 Determine required limestone treatment to bring pH value of soil ranges between 5.5 to 7.5 levels.

.7 Submit two copies of soil analysis and recommendations for corrections to Consultant.

1.4 SCHEDULING OF FINISH WORK

.1 Schedule the placing of the topsoil and grading to permit sodding and seeding within seven days.

1.5 DEFINITIONS

.1 Compost: should be a mixture of soil and decomposing organic matter, for use as a fertilizer, mulch, or soil conditioner. Compost should be processed organic matter, containing 40% or more organic matter.

.2 The product must be sufficiently decomposed (i.e. stable) so that any further decomposition does not adversely affect plant growth (a carbon and nitrogen (C:N) ratio below 25 or 50) and contain no toxic or growth inhibiting contaminates. Composed bio-solids must meet the requirements of the Waste Management CCME PN 1340.

.3 Friable: Soil, which is easily crumbled through fingers when held by hand.

Part 2 Products

2.1 TOPSOIL

.1 All topsoil supplied by the Contractor will be fertile, friable, natural sandy loam containing not less than 4% of organic matter for sandy loams with an acidity value ranging from pH 6.0 to pH 7.0 and capable of sustaining vigorous plant growth. It will be free of stems or roots, stones and or other extraneous matter. Screening of topsoil will be required if designated by the Consultant. Topsoil will not be supplied in a frozen state.

.2 Horticultural Topsoil: growing medium for plant material, consisting of a variable mixture of sand, silt, clay, organic material, and nutrients meeting the following criteria:

.1 45 to 70% sand

.2 0 to 35% silt

.3 14 to 20% clay

.4 2 to 5% organic material

.5 5.5 to 7.5 pH value.

.3 Testing Laboratory: This represents a lab accredited by the Canadian Association for Environmental Analytical Laboratories (CAEAL) and/or Ontario Ministry of Agriculture, Food and Rural Affairs (OMAFRA).

2.2 SOIL AMENDMENTS

.1 Fertilizer:

.1 Complete commercial synthetic fertilizer with minimum 65% insoluble nitrogen.

.2 Formulation ratio - 10-6-4, 10% nitrogen, 6% phosphoric acid, 4% potash.

.3 Adjust fertilizer as per soil test recommendations.

.2 Peatmoss:

.1 Derived from partially decomposed fibrous or cellular stems and leaves of species of Sphagnum Mosses.

.2 Elastic and homogeneous, brown in colour.

.3 Free of wood and deleterious material, which could prohibit growth.

.4 Shredded particle minimum size 5 mm.

.3 Sand: washed course silica sand, medium to course textured.

.4 Limestone:

.1 Ground agricultural limestone containing minimum calcium carbonate equivalent of 85%.

.2 Gradation requirements: percentage passing by weight, 90% passing 1.0 mm sieve, 50% passing 0.125 mm sieve.

.5 Bonemeal: finely ground with a minimum analysis of 20% phosphoric acid.

2.3 SOURCE QUALITY CONTROL

.1 Advise Consultant topsoil sources to be utilized with sufficient lead-time for testing.

.2 Contractor is responsible for amendments to supply topsoil as specified.

.3 Soil testing by recognized testing facility for pH, P and K, and organic matter.

.4 A testing laboratory designated by the Consultant will carry out testing of topsoil. Soil sampling, testing, and analysis are to be in accordance with Provincial standards.

Part 3 Execution

3.1 STRIPPING OF TOPSOIL

.1 Commence topsoil stripping of areas as directed by Consultant after area has been cleared of brush, weeds, and grasses and removed from site. Do not handle topsoil while in wet or frozen condition or in any manner in which soil structure is adversely affected.

.2 Strip Topsoil to depths as indicated by Consultant. Avoid mixing topsoil with subsoil.

.3 Stockpile in locations as directed by Consultant. Stockpile height not to exceed 2 metres.

.4 Disposal of unused topsoil is to be in an environmentally responsible manner but not used as landfill.

.5 Protect stockpiles from contamination and compaction.

3.2 PREPARATION OF EXISTING GRADE

.1 Verify that grades are correct. If discrepancies occur, notify the Consultant and do not commence work until instructions have been received.

.2 Grade the soil, eliminating uneven areas and low spots, ensuring positive drainage. Remove soil contaminated with toxic materials. Dispose of removed materials as directed by Consultant.

.3 Remove debris, roots, branches, stones in excess of 50 mm diameter and other deleterious materials. Remove soil contaminated with calcium chloride, toxic materials, and petroleum products. Remove debris, which protrudes more than 75 mm above surface. Dispose of removed material off site.

.4 Cultivate entire area that is to receive topsoil to depth of minimum 25 mm. Cross cultivate those areas where equipment used for hauling and spreading has compacted soil.

.5 Planting soil for planting of trees, shrubs, and ground covers: mix 4 parts topsoil with 1 part peatmoss. Incorporate bonemeal into planting soil at rate of O.5 kg/m^3 of soil mixture.

3.3 PLACE AND SPREADING OF TOPSOIL - PLANTING SOIL

.1 Spread topsoil after subgrade has been approved. Refer to Drawings for direction of surface drainage.

.2 Spread topsoil with adequate moisture in uniform layers not exceeding 150 mm, over approved, unfrozen subgrade, where sodding, seeding, and planting is indicated.

.3 For sodded areas keep topsoil 15 mm below finished grade.

.4 Spread topsoil to following minimum depths after settlement, **80%** compaction:

.1 150 mm for seeded areas

.2 135 mm for sodded areas

.3 300 mm for flower beds

.4 500 mm for shrub beds

.5 Apply planting soil as indicated on drawings.

.6 Manually spread topsoil/planting soil around trees, shrubs, and obstacles.

3.4 SOIL AMENDMENTS

.1 Apply soil amendments at rate as specified and as determined from soil sample test.

.2 Mix soil amendments into full depth of topsoil prior to application of fertilizer.

.3 Place topsoil at depth of 135 mm for sodded areas unless otherwise specified in the drawings.

.4 Apply planting soil as indicated on drawings and details.

3.5 APPLICATION OF FERTILIZER

.1 Apply fertilizer at least one week after limestone application.

.2 Spread fertilizer uniformly over entire area of topsoil at manufacturer's recommended rate of application or rate determined on basis of soil sample test.

.3 Mix fertilizer thoroughly to the full depth of topsoil.

3.6 FINISH GRADING

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

.2 Consolidate topsoil to required bulk density using equipment approved by the Consultant. Leave surfaces smooth, uniform, and firm against deep foot printing.

3.7 ACCEPTANCE

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

3.8 SURPLUS MATERIAL

.1 Dispose of materials, except topsoil off site or as directed by the Consultant.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

.1 Section 32 91 19.13 – Topsoil Placement and Grading

1.2 REFERENCES

.1 Canadian Nursery Landscape Association (CNLA)

.2 'Canadian Standards for Nursery Stock – Eighth Edition'.

.3 Government of Canada Department of Justice (GCDJ)

.1 F 10 'Fertilizers Act'.

.2 C.R.C., c. 666 'Fertilizers Regulations'

1.3 SOURCE QUALITY CONTROL

.1 Conduct pre-installation meeting to verify project requirements, installation instructions, and warranty requirements.

.2 Submit, prior to installation, the sod information for review by Consultant.

.3 When the proposed sod source is approved, use no other without written authorization.

1.4 DELIVERY AND STORAGE

.1 Schedule the deliveries in order to keep storage at the job site to a minimum without causing delays.

.2 Deliver, unload, and store the sod on pallets.

.3 Deliver the sod to site within 24 hours of being lifted and lay within 36 hours of being lifted.

.4 Do not deliver small, irregular, or broken pieces of sod.

.5 During wet weather allow to dry sufficiently to prevent tearing during lifting and handling.

.6 During dry weather protect the sod from drying and water as necessary to ensure its vitality and prevent dropping of soil in handling. Any dry sod will be rejected.

1.5 SCHEDULING

.1 Schedule the laying of sod to coincide with preparation of the soil surface.

.2 Schedule the sod installation when frost is not present in ground.

Part 2 Products

2.1 MATERIALS

.1 Nursery Sod:

.1 Supplier: Mountainview Golf & Athletic Turf Specialists, 1-819-777-0112 [or approved equal]

.2 Product: 4 Elite Sports Blend (for high traffic use)

.3 Quality and source to comply with standards outlined in 'Canadian Standards for Nursery Stock' – Eighth Edition.

.2 Water: Potable

.3 Fertilizer:

.1 Fertilizer must meet standards of the Canadian 'Fertilizers Act' and 'Fertilizers Regulations'.

.2 Complete slow release fertilizer with maximum 35% water-soluble nitrogen.

.4 Herbicide: type, rate, and method of application will be subject to the approval of the Consultant.

2.2 SOURCE QUALITY CONTROL

.1 Obtain approval from the Consultant for the sod source.

.2 When the proposed sod source is approved, use no other source without written authorization.

Part 3 Execution

3.1 PREPARATION

.1 Verify that grades are correct and prepared in accordance with Section 32 91 19.13. If discrepancies occur, notify the Consultant; 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 the surface until free of humps and hollows to smooth, even grade, to elevations indicated.

.4 Clean immediately, any soil or debris, stone, oils contaminating soil, gasoline and other deleterious materials.

3.2 SOD PLACEMENT

.1 Lay the sod during the growing season. Placing sod during dry summer periods, freezing temperatures, or over frozen soil, will be unacceptable.

.2 Lay the sod in rows, perpendicular to slope, smooth, and even with adjoining areas, and with joints staggered. Butt sections closely without overlapping or leaving gaps between sections. Cut out irregular or thin sections with sharp implements. The sod should be staked on slopes greater than 2.5:1.

.3 Provide close contact between sod and soil by means of a light roller. Heavy rolling to correct grade irregularities not permitted.

.4 Water the sod immediately after laying the sod to obtain moisture penetration through the sod into top 100 mm of topsoil.

.5 Provide adequate moisture protection of sodded areas against erosion and mechanical damage. Remove protection after lawn areas have been accepted.

3.3 MAINTENANCE DURING ESTABLISHMENT PERIOD

.1 Perform following operations from time of installation until acceptance.

.1 Water sodded areas in sufficient quantities and at frequency required to maintain subsoil immediately under the sod continuously moist to depth of 75-100 mm.

.2 Cut grass for the first time to 50 mm when or prior to it reaching height of 70 mm. Remove clippings, which will smother, grassed areas as directed by the Consultant.

.3 Maintain the sodded areas to 95% weed free.

.4 Fertilize sodded areas one month after sodding with 2:1:1 ratio fertilizer. Spread the fertilizer evenly at the rate of 0.5 kg of nitrogen/$^{100\ m2}$ and water in well.

3.4 ACCEPTANCE

.1 Sodded areas will be accepted at final inspection provided that:

.1 Sodded areas are properly established.

.2 Sodded areas are free of bare and dead patches.

.3 Sodded areas have been cut minimum of two times.

.4 Lawns sodded after September 30th will be accepted in following spring a month after the start of the growing season, provided acceptance conditions are fulfilled.

.2 The contractor will not be held responsible for damage due to salt, snow removal, or vandalism.

.3 Areas sodded in fall will be accepted in the following spring a month after the start of the growing season provided acceptance conditions are fulfilled.

3.5 MAINTENANCE DURING WARRANTY PERIOD

.1 Perform following operations from time of acceptance until the end of warranty period:

.1 Water sodded areas at weekly intervals to obtain optimum soil moisture conditions to depth of 100 mm.

.2 Dead or bare patches must be repaired and resod, to the satisfaction of the Consultant.

.3 Cut grass and remove clippings that will smother grass.

.4 Cut grass at two week intervals or as directed by the Consultant, but at intervals so that approximately one third of the growth is removed in single cut.

.5 Fertilize areas in accordance with the fertilizing program. Spread half of the required amount of fertilizer in one direction and remainder at right angles and water in well.

.6 Eliminate weeds by means acceptable to Consultant.

END OF SECTION

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Part 1 General

1.1 RELATED SECTIONS

.1 Section 32 91 19.13 – Topsoil Placement and Grading

1.2 SCOPE OF WORK

.1 The Contractor shall provide maintenance and warranty of all plant material. The maintenance work of this section shall include watering, weeding, fertilizing, pruning and other incidental maintenance deemed necessary to ensure healthy plant material for a period of two years upon completion of planting. The warranty shall cover any defects in materials and workmanship. Any damage to existing turf areas, vegetation, hard surfaces, structures or services caused as a result of the Contractor's work methods and practices for plant material maintenance shall be reinstated or repaired to the satisfaction of the Consultant. The cost of such reinstatement or repair shall be solely at the Contractor's expense.

1.3 REFERENCES

.1 All methods of maintenance shall be in accordance with accepted horticultural / arboricultural practices and standards.

Part 2 MATERIALS

2.1 WATER

.1 Water shall be free from any contaminants that could adversely affect plant growth.

2.2 FERTILIZER

.1 Fertilizer shall be a complete commercial type. Formulation and application rate to be determined by soil tests. For estimating purposes, use 10-52-10 applied at a rate of:
.1 **0.9 kg** for each **25 mm** of tree caliper (water soluble). Deliver to site in fully labeled bags.

2.3 TOPSOIL

.1 Any additional topsoil required shall originate from the same source as the initial approved product.

2.4 RODENT GUARDS

.1 Rodent guards shall originate from the same source as the initial approved product.

2.5 MULCH

.1 Mulch shall originate from the same source as the initial approved product.

2.6 CONIFEROUS TREE WRAP

.1 Wrapping material for winter protection of coniferous trees shall be new burlap, at least 270 g/m2 in weight supplied in 1.0 m wide or 1.5 m wide rolls.

2.7 RODENT REPELLANT

.1 Rodent repellent shall be a liquid, formulated to contain 12% Thiram, coloured as to remain visible for a minimum of twenty-four hours after application. Acceptable product is "Scoot" or approved equal.

Part 3 EQUIPMENT

3.1 PUMPS AND HOSES

.1 Hoses used for watering plant material shall be capable of reaching the limits of the contract area. Pumps shall be under pressure. The outlet end of the hose(s) shall be 25 mm in diameter with a suitable adjustable nozzle(s) and a quick shut-off valve.

3.2 TANKS

.1 Tanks used for storage or application of water shall be clean and free of any contaminants that may be hazardous to the growth and development of plant material or to the environment in general.

3.3 PRUNING TOOLS

.1 All pruning equipment shall be designed specifically for tree work and shall be clean, sharp and in proper, safe, working order. Pruning equipment shall be capable of producing clean, flush cuts without tearing or fraying the bark.

Part 4 CONSTRUCTION

4.1 DURATION

.1 All plant material shall be warrantied for a period of two years from the date of SUBSTANTIAL COMPLETION of landscape works. The Contractor shall provide maintenance immediately after each portion of planting is completed and continue throughout the period of warranty to the satisfaction of the Consultant.”

4.2 OPERATIONAL CONSTRAINTS

.1 The Contractor shall be responsible to obtain any permits or certificates for water usage. No maintenance equipment, materials or other miscellaneous items may be stored on site unless approved by the Consultant. All debris, waste and other extraneous material resulting from the maintenance operation shall be removed from the site daily upon completion of maintenance, unless otherwise directed or approved by the Consultant. The Contractor shall be fully acquainted with all relevant Provincial and Municipal By-laws relating to the work of this contract, and will be required to comply with such by-laws without extra compensation.

4.3 WATERING

.1 During the first and second year of the warranty period, between May 15 and September 15 of each year, watering of ALL plants shall be carried out no less than twelve, (12) times, in accordance with the pre-approved watering schedule provided by the Contractor.

.2 The Contractor shall uniformly soak reforestation and shrub areas to a depth of 300 mm using a soft spray nozzle to avoid "packing" of soil and damage to vegetation. Each nursery stock tree (greater than 40 mm caliper or 1.20 m height) shall be watered in accordance with Table 1 and using one of the following watering methods.

.1 Water Injection Method: Each tree shall be watered by two injection applications directly into the soil. Both injections shall be located at the outer edge of the planting pit area and shall penetrate the ground to a depth of 450mm at the commencement of the watering operation. The second injection shall be located 180 degrees from the initial injection.

.2 Soak Method: The planting saucer of each tree shall be filled with water and the water allowed to percolate into the soil before being re-filled as many times as necessary to meet the volume requirements of Table 1.

TABLE 1: Water application rates for each tree:

Tree Caliper	Tree Height	Litres per Watering
40 - 70mm	1.20 - 1.8m	170
71 - 100mm	1.81 - 2.50m	230
101 - 125mm	2.51 - 3.00m	270
126 - 150mm	3.01 - 3.50m	360
151 - 200mm	3.51 - 4.00m	460

.3 All coniferous trees shall be watered in late fall, just prior to freeze-up.

.4 Water shall be applied so that the washing of the soil or dislodging of mulching or tree guards does not occur.

.5 Damage shall be immediately repaired to the satisfaction of the Consultant at no additional cost.

4.4 FERTILIZING

.1 Apply fertilizer at the same time or as part of a watering application. Apply fertilizer as recommended by soil analysis report, subject to adjustment by the Consultant.

4.5 MULCHING

.1 In the autumn and spring of the warranty period the Contractor shall re-staple or replace plastic blankets or woodchip mulch to meet the specifications.

4.6 WEEDING

.1 All weeds and grasses within saucers, beds and mulched areas around plant material shall be removed by hand. Weed whackers or whipper-snippers shall not be used to remove weeds in the vicinity of plant material. The application of herbicides shall not be permitted unless otherwise approved by the Consultant. Removed weeds and grasses shall be disposed of the Contract site. At a minimum, weeding shall occur at one month intervals, with the first operation occurring at the beginning of July and the final operation occurring in early October. All areas shall be weeded immediately prior to the final warranty inspection.

4.7 RODENT GUARDS

.1 In the autumn and spring of each warranty year, the Contractor shall re-position or replace rodent guards to meet the specifications.

4.8 STAKES

.1 In the autumn of the first warranty year, the Contractor shall ensure that all stakes are secure and functioning properly. Remove all stakes one year from the date of final

acceptance of plant material, unless otherwise directed by the Consultant.

4.9 CONIFEROUS TREE WRAPPING

.1 In the autumn of each warranty year, the Contractor shall wrap all coniferous trees greater than 600 mm in height. The entire needle area shall be completely covered with burlap wrap. Edges of the wrap shall be overlapped a minimum of 100 mm with the exposed edge folded back under and fastened with metal fasteners. After each tree is wrapped, the burlap will be securely fastened with nylon twine or wire to ensure that the wrapping does not unravel. All wrapped trees shall be unwrapped by the Contractor during the following spring, prior to bud break. All materials used to wrap and unwrap the trees shall be removed from the contract site.

4.10 RODENT REPELLANT

.1 The Contractor shall apply rodent repellent to all plant material as required. The Contractor shall be responsible to monitor plant material throughout the winter and for re-applying rodent repellent as required.

4.11 REMOVAL OF SALT SPRAY

.1 When natural spring precipitation (Apr 1 - 30) of each warranty year is less than 80 mm, the above ground parts of all plant material, within 10 m of the roadway edge upwind of prevailing winds and within 100 m of the roadway edge downwind of prevailing winds, shall be thoroughly sprayed with water to remove salt spray deposits prior to May 15. A soft spray nozzle shall be used. Precipitation data shall be as per Environment Canada from the Macdonald-Cartier Airport weather station.

4.12 INFESTATION

.1 Monitor plant material throughout the warranty period for any sign of disease or insect problems. Ensure immediate treatment to control and repair damage. Cultural or non-toxic methods of control shall be given first priority. Do not use D.D.T. or other chemicals prohibited by Agriculture Canada. All chemicals must be approved by the Consultant prior to use. It is the Contractor's responsibility to inform the Consultant before applying any corrective actions.

Part 5 QUALITY ASSURANCE

5.1 QUALIFICATIONS OF WORKERS

.1 Contractor shall provide proof of a foreman with a minimum of five years' experience, competent and skilled in the work of this section to direct all of the work to be performed, and to be present at all times during the performance of the work. Acceptable forms of proof:

.1 ISA Certification as an arborist
.2 Diploma in horticulture from a recognized College
.3 Ontario Tradesman Certificate
.4 An acceptable combination of education, training and experience (as determined by the Consultant)

5.2 INTERIM REPLACEMENT PLANT MATERIAL

.1 Throughout the maintenance and warranty period, units of plant material that are found to be unacceptable will be replaced by the Contractor at the earliest opportunity. At the discretion of the Consultant, plant material that is identified as dead or in a poor or

diseased condition shall be immediately removed from the site. All replacement plant material shall be as per the size indicated on the drawings. These sizes are the minimum allowable.

5.3 FINAL WARRANTY INSPECTION

.1 A one-time inspection of all plant material shall be carried out by the Consultant upon completion of the maintenance and warranty period. Plant material shall be acceptable when it meets the quality requirements set out in the specifications for plant material. All planting pits, beds, and other areas worked by the Contractor shall be free of weeds and in good order, including the removal of all stakes. Plant material shall be unacceptable when it does not meet this quality standard. Units of plant material that are found to be unacceptable will be replaced by the Contractor at the earliest opportunity. The Consultant reserves the right to extend the Contractor's maintenance and warranty responsibilities for an additional one-year for replacement plant material. In the event that this inspection is satisfactory to the Consultant, and that there are no outstanding commitments to the contracted works, the Contractor will be given final approval of the maintenance and warranty requirements.

Part 6 SCOPE OF MAINTENANCE

6.1 PLANT MATERIAL MAINTENANCE

.1 Where maintenance and replacement of plant material is required during the warranty period, all such costs will be the responsibility of the contractor. No additional costs will be borne by the Owner.

.2 Maintenance of plant material will be reviewed at the following times:

.1 **31 October** (end of first fall maintenance period)

.2 **31 October** (end of second fall maintenance period)

.3 **01 June** (end of second spring maintenance period and of warranty)

.3 **Where, in the opinion of the Consultant, the Contractor has failed to complete obligations as detailed in this Specification; and further, fails to rectify said deficiency within two days of written notification from the Consultant, the Owner reserves the right to complete the work and deduct incurred expenses from monies owing to the Contractor.**

END OF SECTION

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APPENDIX

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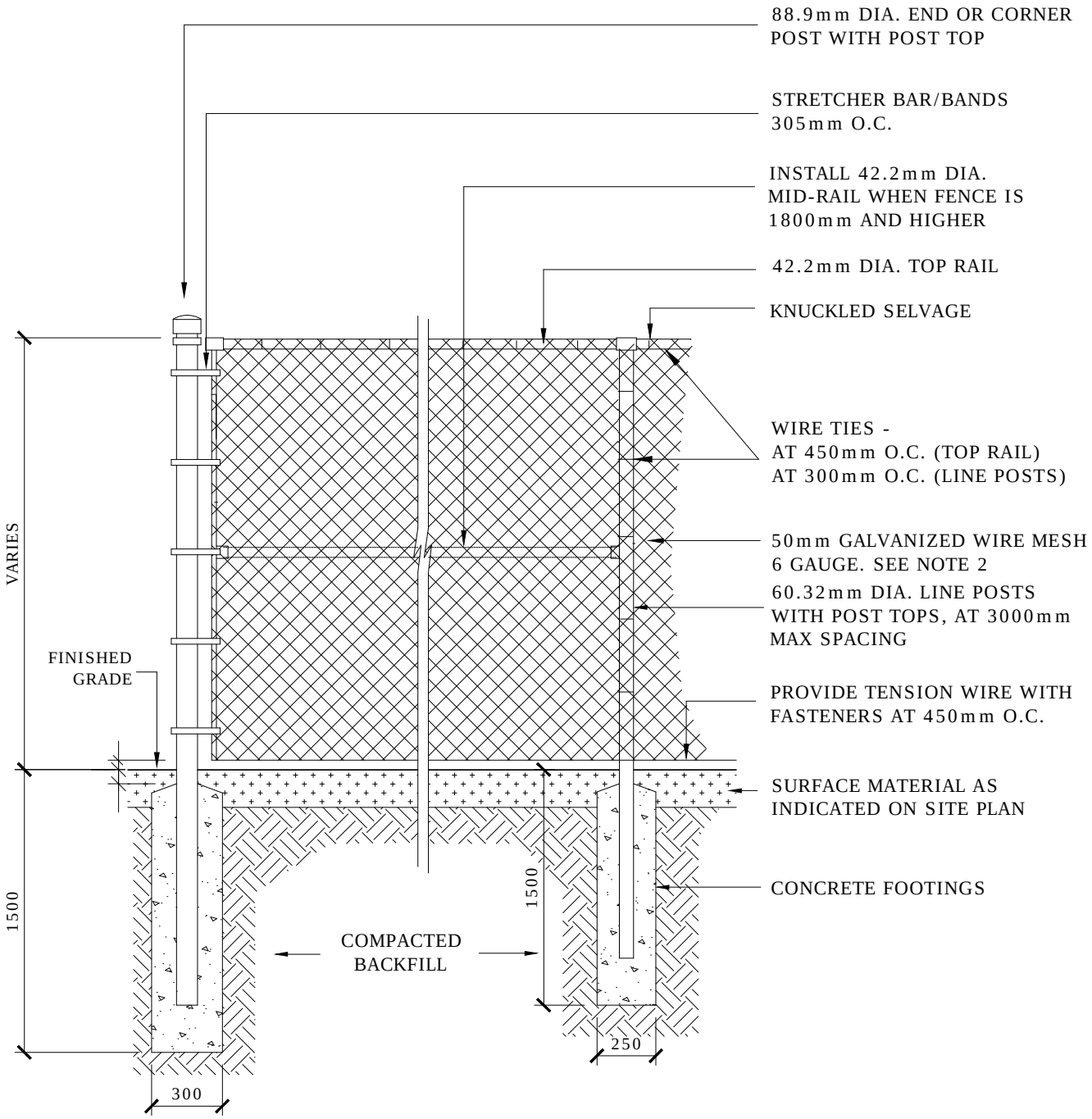

NOTES:

1. ALL MEASUREMENTS ARE IN MILLIMETRES UNLESS OTHERWISE NOTED
2. IF FENCE IS TO BE BLACK VINYL, THE FENCE SHOULD BE 9 GAUGE GALVANIZED WIRE CORE WITH BLACK VINYL COATING TO PROVIDE A TOTAL OF 6 GAUGE THICKNESS
3. POSTS, RAILS AND ALL OTHER HARDWARE SHOULD BE ELECTROSTATIC PAINTED
4. CONCRETE FOOTING SHALL BE CSA 30MPa CLASS F-1

Ottawa	TITLE: CHAINLINK FENCE	DATE: FEB 2013
		REV: FEB 2019
		DWG No: F9

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