LIST OF SPECIFICATIONS

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LIST OF SPECIFICATIONS

Division 31 - Earthwork

Division 32 – Exterior Improvements

PART 1 - GENERAL

1. Description

1 This specification covers the furnishing of all labour, materials, equipment and services required to supply and install the works as depicted by the plans; and as specified hereinafter.

2 Comply with requirements and conditions of the Municipality. Request for Tender, Division1; the General Conditions of Contract; Supplementary Conditions and any requirements of Special Provisions applicable to this section of the work.

2. General

1 Comply with requirements and conditions of the Municipality Request for Tender, Division1; the General Conditions of Contract; Supplementary Conditions and any requirements of Special Provisions applicable to this section of the work.

2 Division 1 requirements apply to all sections of work.

3 In case of conflict between General Conditions and Division 1 requirements, General Conditions shall govern.

3. Summary of Work

1 Provide all items, articles, materials, services and incidentals, whether or not expressly specified or shown on drawings, to make finished work complete and fully operational, consistent with the intent of the contract documents.

4. Examination

1 Examine the site and surrounding areas and be fully informed as to the conditions and limitations under which the work has to be executed. Claims for additional costs will not be entertained with respect to conditions which could reasonably have been ascertained by an inspection of the site prior to tender closing.

2 Prior to commencement of work, make careful examination of previously executed work, existing conditions, levels, dimensions and clearances. Promptly advise consultant of unsatisfactory preparatory work and substrate conditions; commencement of work implies acceptance of conditions.

5. Division of Work

1 Work specified in the specification has been divided into technical sections for the purpose of ready reference. Division of work among subcontractors and suppliers is solely the contractor's responsibility and consultant

assumes no responsibility to act as an arbiter to establish subcontract limits between sections or divisions of work.

6. Metric Project

1 This project is based on the International System of Units (SI). Measurements are expressed in metric (SI) units and depending on the progress made in the various sectors of the industry are either hard or soft converted units.

2 All metric units specified shall be taken to the minimum acceptable unless otherwise noted.

3 It is the contractor's responsibility to check and verify with manufacturers and suppliers on the availability of materials and products in either metric or imperial sizes.

4 Where a material or product cannot be obtained in the metric size specified, provide the next larger imperial size available.

5 Where the metric and imperial size or dimensions are both shown on details and plans, the metric size or dimension shall govern.

7. Protection

1 Ensure that no damage is caused to existing structures, buildings, foundations, pavement, fences, curbs, grounds, plants, property, utilities, services or finishes during the progress of work. Repair and make good any damage caused at no extra cost to owner to the complete satisfaction of the respective property owners and authorities having jurisdiction. Do not proceed with repairs or remedial work without written permission of the consultant. Only trades specifically capable of performing the work will be allowed to make remedial or repair work.

2 Keep all roads clean of mud and debris resulting from construction traffic. Make good any damages caused to roads by the activity of the contract.

3 Prevent soiling of pavement due to spillage, mixing of material or any other cause. Make good any damages caused.

4 Protect new work from damage with suitable protective coverings.

8. Safety and Security

1 Be responsible for security of all areas affected by work of this contract until taken over by owner. Take steps to prevent entry to the work by unauthorized persons and guard against theft, fire and damage by any cause.

2 A regular full-time watchman is generally not required on site, but if in the opinion of the consultant, the work is not adequately protected by the contractor, the owner may demand that a watchman be employed by the contractor at no extra cost to the contract.

3 Maintain fire protection for work. Store paints and volatile substances in a separate and controlled location and inspect frequently. Inspect temporary wiring, drop cords, extension cables for defective insulation or connections frequently. Remove combustible wastes frequently. Prohibit smoking in areas where volatile and flammable substances are used.

9. Use of Site and Premises

1 Accept full responsibility for the site from the time of contract award until Final Acceptance of the work.

2 Check means of access and egress, rights and interests which may be interfered with. Do not block lanes, roadways, entrances or exits.

3 Where encroachment beyond property limits is necessary make arrangement with respective property owners.

10. Services and Utilities

1 Consult with utility companies and other authorities having jurisdiction to ascertain the locations of existing services on or adjacent to site.

2 Information as to the location of existing services, if shown on the drawings, does not relieve the contractor of his responsibility to determine the exact number and location of existing services.

3 Give proper notices for new services as may be required. Make arrangements with authorities and utilities for service connections required.

4 Pay any charges levied by utilities or authorities for work carried out by them in connection with this contract, unless specified otherwise.

5 Operate and maintain all utility systems affected by work of this contract, until the project or specific portions thereof have been accepted by the owner.

6 Report existing unknown services encountered during excavation to consultant for instructions; cutback and cap or plug unused services. Be responsible for the protection of all active services encountered and for repair of such services if damaged.

11. Site Access

1 Site access to any component of the project is the contractor's full responsibility to review during the tender stage, and to include the necessary costs accordingly. These costs are to be included in the miscellaneous section Mobilization/Demobilization. Upon completion, restore all access routes to original condition.

END

SITE ADMINISTRATION

PART 1 - GENERAL REQUIREMENTS

1. Pre-Construction Meeting

1 Immediately prior to construction, upon notification, attend at location of owner's choice, pre-construction meeting along with authoritative representatives of certain key subcontractors as specifically indicated in the meeting notice.

2 Purpose of meeting is as follows:

1. Review project communications procedures.
2. Review contract administration requirements including submittals, payment and change order procedures.
3. To review the contractor’s proposed schedule and timeline and identify all critical points on construction schedule for positive action.
4. Identify any product availability problems and substitution requests.
5. Establish site arrangements and temporary facilities.
6. Review any points which, in owner's, consultant's and contractor's opinion, require clarification.

2. Site Meetings

1 Prior to the commencement of the work the contractor, the consultant and the owner, shall mutually agree to a sequence for holding regular "on site meetings".

2 Organize all necessary site meetings. Ensure that persons, whose presence is required, are present and that relative information is available to allow meetings to be conducted efficiently.

3 The consultant will record minutes of each meeting and promptly distribute copies to all participants not later than five days after the meeting has been held.

3. Supervision

1 Employ an experienced and qualified superintendent who shall devote his time exclusively to the work of this contract and who shall be in complete charge of the work from commencement to completion. A working foreman will not be acceptable. The superintendent shall not be changed after commencement of work without the consultant's approval.

2 Supervise, direct, manage and control the work of all forces carrying out the work, including subcontractors and suppliers. Carry out daily inspections to ensure compliance with the contract documents and the maintenance of quality standards. Ensure that the inspection staff includes personnel competent in supervising the mechanical and electrical trades if applicable.

4. Progress Record

1 Maintain, on site, a permanent written record of progress of work. Record shall be open to inspection by consultant at all times and a copy shall be furnished to consultant upon request.

2 This record shall show weather conditions, dates of commencement, progress and completion of various trades and items of work. Particulars pertaining to erection and removal of forms, pouring of concrete, and other critical or major components as well as number of employees of various trades and type and quantity of equipment employed daily shall be noted.

3 Display a copy of the construction schedule on site from start of construction to completion. Superimpose actual progress of work on schedule at least once each week.

5. Record Drawings

1 Obtain and keep on site at all times a complete and separate set of black line white prints.

2 Note clearly, neatly, accurately and promptly as the work progresses all architectural, structural mechanical and electrical changes, revisions and additions to the work and deviations from the contract documents.

3 Accurate location, depth, position, size and type of concealed and underground services, both inside and outside shall be included as part of these record drawings.

4 Record drawings shall be available for review at each site meeting.

5 Refer to Section 01700 for requirements on submission of record drawings.

6. Documents on Site

1 The contractor shall at all times have in his possession a complete set of contract documents (drawings and specifications) with all addenda, site instructions, change orders, reviewed shop drawings and samples, colour schedule, paint materials schedules, hardware list, progress reports and meeting minutes.

END

ALLOWANCES

PART 1 - GENERAL REQUIRMENTS

1. Related Instructions

1 Comply with requirements for Cash Allowances and Quotations for work as may be described by the General Conditions and Supplementary General Conditions.

2. Authorization

1 Expenditures from allowances included in the contract price must be authorized in writing by the consultant.

3. Allowances

1 Include the following allowances in the Contract.

Testing Allowance	$5,000.00

4. Quotations

1 Should the contractor have to obtain quotations for any work in the Allowances Section, the time expended for obtaining such quotes is the contractor's cost.

2 If the owner accepts the quotation, then the cost for time spent bidding is billable as overhead expense. It may be billed only when that particular product or service is delivered or installed at the project.

5. Limitations

1 All work listed in Allowances may or may not be incorporated in the work. The owner has full right to delete any or all parts without claim.

END

SUBMITTALS

PART 1 - GENERAL REQUIREMENTS

1. General

1 Unless specified otherwise, make all submissions to the consultant at his office.

2 Make all submissions required by the contract documents with reasonable promptness and in orderly sequence so as to cause no delay in the work.

2. Related Work

3 Submission of maintenance and record documents: Section 01 77 00 - Project Closeout.

4 Submission of maintenance materials: Section 01 77 00 - Project Closeout.

3. Construction Schedule

1 Within 7 days after award of contract, in a format approved by the consultant, submit a complete construction schedule for work of entire contract.

2 Show in the construction schedule start and completion dates of each item of work, including erection and dismantling of temporary services.

4. Shop Drawings

1 Submit shop drawings required by contract documents, in accord with requirements of the General Conditions.

2 Prepare shop drawings in metric measurements only. Shop drawings containing imperial measurements will be rejected.

3 Unless otherwise directed by the consultant, submit the following number of prints for each shop drawing required:

1. Landscape Architectural shop drawings: **2 prints** or 1 copy in electronic pdf format
2. Structural, mechanical, electrical shop drawings: **3 prints** or 1 copy in electronic pdf format

4 Shop drawings which require the approval of a legally constituted authority having jurisdiction shall be submitted by contractor to such authority for approval. Such shop drawings shall receive final approval of authority having jurisdiction before consultant's final review.

5 No work requiring a shop drawing submission shall be commenced until the submission has received consultant's final review.

6 The consultant's review is for the sole purpose of ascertaining conformance with the general design concept. This review shall not mean that the consultant approves the detail design, which is inherent in the shop drawings, responsibility for which shall remain with the contractor submitting same, and this review shall not relieve the contractor of his responsibility for meeting the requirements of the contract documents. The contractor is responsible for dimensions to be confirmed and correlated at the job site for information that pertains solely to fabrication processes or to techniques of construction and installation and for coordination of the work of all sub-trades.

5. Samples

1 Submit samples required by contract documents and as directed by the consultant.

2 Unless indicated otherwise, submit samples in duplicate.

3 Submit samples with identifying labels bearing material or component description, manufacturer's name and brand name, contractor's name, project name, location in which material or component is to be used, and date.

4 Prepay any shipping charges involved for delivering samples to destination point and returning to point of origin if required.

5 No work requiring a sample submission shall be commenced until the submission has received consultant's final review.

END

ENVIRONMENTAL PROCEDURES

PART 1 - GENERAL REQUIREMENTS

1. DEFINITIONS

1 Environmental Pollution and Damage: presence of chemical, physical, biological elements or agents which adversely affect human health and welfare; unfavourably alter ecological balances of importance to human life; affect other species of importance to humans; or degrade environment aesthetically, culturally and/or historically.

2 Environmental Protection: prevention/control of pollution and habitat or environment disruption during construction.

2. ACTION AND INFORMATIONAL SUBMITTALS

1 Submit in accordance with Section 01 33 00 - Submittal Procedures.

2 Product Data:

1. Submit manufacturer's instructions, printed product literature and data sheets for all materials to be used on site prior to the materials arriving on site.
2. Submit electronic copies of WHMIS MSDS in accordance with this Section.

3 Traffic Control Plans including measures to reduce erosion of temporary roadbeds by construction traffic, especially during wet weather.

4 Work area plan showing proposed activity in each portion of area and identifying areas of limited use or non-use.

1. Plan to include measures for marking limits of use areas and methods for protection of features to be preserved within authorized work areas.

5 Spill Control Plan to include procedures, instructions, and reports to be used in event of unforeseen spill of regulated substance.

3. FIRES

1 Fires and burning of rubbish on site is **not** permitted.

4. DRAINAGE

1 Develop and submit an Erosion and Sediment Control Plan (ESC) identifying type and location of erosion and sediment controls provided. Plan to include monitoring and reporting requirements to assure that control measures are in compliance with erosion and sediment control plan, Federal, Provincial, and Municipal laws and regulations.

2 Provide temporary drainage and pumping required to keep excavations and site free from water.

3 Ensure pumped water into waterways, sewer or drainage systems is free of suspended materials.

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

5. SITE CLEARING AND PLANT PROTECTION

1 Protect trees and plants on site and adjacent properties as indicated, with the exception of those to be removed as indicated.

2 Protect trees and shrubs adjacent to construction work, storage areas and trucking lanes, and encase with protective wood framework from grade level to height of 2 metres minimum.

3 Protect roots of designated trees to be protected to dripline during excavation and site grading to prevent disturbance or damage.

1. Avoid unnecessary traffic, dumping and storage of materials over root zones.

4 Minimize stripping of topsoil and vegetation.

5 Restrict tree removal to areas indicated.

6. WORK ADJACENT TO WATERWAYS

1 Construction equipment to be operated on land only.

2 Waterways to be kept free of excavated fill, waste material and debris.

3 Provide the necessary controls to prevent sediment and construction debris from migrating into the adjacent waterway.

7. POLLUTION CONTROL

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

2 Control emissions from equipment and plant in accordance with local authorities' emission requirements.

3 Prevent sandblasting and other extraneous materials from contaminating air and waterways beyond application area.

1. Provide temporary enclosures where required or as directed by the Consultant.

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

PART 2 - Products

1. NOT USED

1 Not Used.

PART 3 - Execution

1. CLEANING

1 Progress Cleaning: clean in accordance with Section 01 74 00 - Cleaning.

1. Leave Work area clean at end of each day.

2 Ensure public waterways, storm and sanitary sewers remain free of waste and volatile materials disposal.

3 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 00 - Cleaning.

END

REGULATORY REQUIREMENTS

PART 1 - GENERAL REQUIREMENTS

1. Permits, Licenses, Fees

1 Where permits, licenses and inspection fees are required by authorities having jurisdiction for specific trade functions, they shall be obtained and paid for by the particular sub-trade responsible for that work. Any required municipal Building Permits shall be arranged-for by the Municipality and finalized by the contractor in a timely fashion for the administration of the works.

2. Building Code By-laws, Regulations

1 Carry out work in accordance with requirements of the Ontario Building Code, latest issue, including all amendments and revisions.

2 Comply with requirements, regulations and ordinances of other authorities having jurisdiction.

3 Where it is necessary to carry out work outside property lines, such as sidewalks, paving or concrete curbs, comply with applicable requirements of municipal authorities having jurisdiction.

4 Promptly submit written notice to consultant of observed variance of Contract Documents from requirements of Building Code and authorities having jurisdiction. Assume responsibility for work known to be contrary to such requirements and performed without notifying consultant.

3. Safety Requirements

1 Be governed by pertinent safety requirements of Federal or Provincial Governments and of municipal bodies having authority, particularly the Ontario Construction Safety Act, Book 7 Traffic Management requirements, and the regulations of Ontario Ministry of Labour, and work in conjunction with proper safety associations operating under the authority of Ontario Workplace Safety and Insurance Act.

2 Do not, in the performance of the work, in any manner endanger the safety or unlawfully interfere with the convenience of the public.

4. Fire Protection Requirements

1 Refer to technical Sections of Specifications and Drawings for fire protection requirements.

2 Test methods used to determine fire hazard classification and fire endurance rating shall be as required by Ontario Building Code.

3 Upon request, furnish to consultant with evidence of compliance with project fire protection requirements.

5. Safety Regulations

1 The contractor shall ensure that all staff, including contract staff, are trained under the provision of the W.H.M.I.S. (Workplace Hazardous Material Information System) regulations.

2 The contractor shall ensure that Material Safety Data Sheets are available for all chemicals used on site.

3 The contractor shall conform to and enforce strict compliance with the Construction Safety Act and regulations made under the Act.

4 The contractor shall be aware of and conform to Municipality Health and Safety Policies made available through the Purchasing Department.

5 For purposes of the Occupational Health and Safety Act, the contractor will be designated as the constructor for this project and will assume all of the responsibility of the constructor set out in that Act and its regulations.

6 The contractor shall ensure that all necessary measures are taken to protect Municipality employees, general public and workers from injury.

END

QUALITY CONTROL

PART 1 - GENERAL REQUIREMENTS

1. General

1 Requirements specified in this section apply to independent inspection and testing specified under technical specification sections.

2 Requirements specified in this section do not apply to the following:

1. Inspection and testing required by laws, ordinances, rules, regulations and orders of public authorities.
2. Inspection and testing performed exclusively for contractor's convenience.

3 Failure by independent testing agency to detect defective work or materials shall not in any way prevent later rejection when such defect is discovered, nor shall it obligate consultant for final acceptance.

2. Related Instructions

1 Cash Allowance for independent inspection and testing:

1. Section 01 21 00

2 Specific inspection and testing requirements:

1. Divisions 2 to 33 inclusive.

3. Duties & Authority of Testing Agency

1 Testing agency is expected to do the following:

1. Act on a professional and unprejudiced basis and carry out inspection and testing functions to establish compliance with requirements of contract documents.
2. Check work as it progresses and prepare reports stating results of tests and conditions of work and state in each report whether specimens tested conform to requirements of contract documents, specifically noting deviations.
3. Distribute reports as follows:
    1. Consultant - three (3) copies
    2. Contractor - two (2) copies

2 Testing agency is not authorized to amend or release any requirements of contract documents, nor approve or accept any portion of work.

3 Contractor shall do the following:

1. Notify testing agency minimum 48 hours in advance of operations to allow for assignment of personnel and scheduling of tests without causing delay in work.
2. Provide testing agency with access to work at all times.
3. Supply material samples for testing.
4. Supply casual labour and other incidental services required by testing agency.
5. Provide facilities for site storage of samples.

4 When initial inspection and testing indicates non-compliance with contract documents, any subsequent re-inspection and re-testing occasioned by non-compliance shall be performed by same testing agency and cost thereof borne by contractor.

END

LINES AND LEVELS

PART 1 - GENERAL REQUIREMENTS

1. Lines and Levels

1 The Contractor shall provide a written confirmation of the acceptance of the survey base information as provided in the Contract Documents. Verify all elevations, lines, levels and dimensions as indicated and report any errors, conflicts, or inconsistencies to the consultant before commencing work or as soon as discovered.

2 Accurately lay out work and establish lines and levels in accordance with requirements of contract documents.

3 Set up, maintain and protect permanent reference points and provide general dimensions and elevations for all sections of work.

2. Dimensions

1 Check and verify dimensions wherever referring to work. Dimensions, when pertaining to work of another section, shall be verified with section concerned. Details and measurements of work which is to fit or conform to work installed shall be taken at site.

2 Do not scale drawings. If there is ambiguity, lack of information or inconsistency, immediately consult consultant for directions. Be responsible for extra costs involved through the disregarding of this notice.

3 While the contractor is responsible for own survey control, the owner reserves the right to check completed work. Any discrepancy shall be addressed immediately. Fully correct any work not built per plans.

END

TEMPORARY FACILITIES

PART 1 - GENERAL REQUIREMENTS

1. General

1 Provide all temporary facilities and controls required for the proper execution of the work.

2 Provide and maintain temporary systems in accordance with applicable regulations and requirements. Arrange for, obtain and pay for any permits required.

3 Location of temporary facilities shall be subject to consultant's approval.

2. Temporary Electricity, Lighting and Water

1 Provide temporary electrical lighting and power system and water for use by all sections.

2 Arrange, obtain and pay for service including meter, if required, of sufficient size to allow use of required tools and equipment and to ensure adequate lighting levels for the proper execution of work.

3 Install and maintain temporary electrical systems in accordance with Construction Safety Association's "Temporary Wiring Standards on Construction Sites", the Ontario Electrical Code and other authorities having jurisdiction.

3. Temporary Heating

1 Furnish equipment, labour and fuel to provide temporary heat as required for proper execution of work.

4. Temporary Telephone

2 Provide telephone service for duration of contract until completion. A mobile phone is acceptable.

3 Make telephone available to all sections. Long distance calls shall be paid by party making call.

5. Temporary Sanitary Facilities

1 Provide toilet facilities for all personnel on site.

2 Keep facilities clean and sanitary and provided with required supplies at all times.

3 Except where temporary sanitary facilities are connected to municipal sewer system, periodically remove waste from site.

6. Temporary First-Aid Facilities

1 Provide site equipment and medical facilities necessary to supply first-aid service to injured personnel in accordance with regulations of the Worker's Compensation Act. Maintain facilities for duration of contract.

7. Temporary Fire Protection

1 Provide and maintain in proper working order, fire extinguishers, prominently placed, until completion of work.

2 Fire extinguishers shall be minimum 3 kg. 4A60BC type.

3 Remove fire extinguishers from site upon completion of work or when directed by consultant.

4 Where gas welding or cutting is to be done within 3m of, or above combustible material, or above space that may be occupied by persons, interpose shields of non-combustible material. Tanks supplying gases for welding or cutting shall be placed at no greater distance from the work than is necessary and shall be securely fastened in an upright position. Such tanks shall be free from exposure to the sun or high temperature.

8. Construction Aids

1 Provide temporary stairs, ladders, and ramps required for movement and placing of materials, equipment and personnel.

2 Provide mechanical hoisting equipment and fully qualified operators as required during construction.

3 Erect required scaffolding independent of walls, arranged to avoid interference with work of other sections as much as possible.

4 Provide and maintain required shoring and bracing in accordance with Construction Safety Act and other applicable regulations.

5 Shoring and all false work over one tier in height shall be designed and shall bear the stamp of a registered professional engineer having experience in this field.

6 The use of explosive power tools must be approved in writing by the consultant. The use of explosive power tools will not be permitted under any circumstances unless equipped with a device, which positively prevents free flight of the stud.

9. Barriers

1 The project site is to be fully protected at all times during the course of the works and up-to and until the works are accepted by the municipality. Appropriate hoarding is to be erected around excavations and secured for

overnight periods. Entrances to the site from surrounding properties are to be competently secured to prevent unauthorised access to the project site and its work areas.

2 Protect public and workers from injury. Play Areas are to be protected and secured with construction fencing until Substantial Completion or as directed by the Landscape Architect.

3 Provide and maintain required barricades, warning signs, guardrails and light-guards in accordance with applicable regulations.

10. Temporary Controls

1 Provide protective coverings to protect work against damage caused by weather including but not necessarily limited to rain, snow, ice, wind, frost and excessive heat.

2 Provide wind breaks and sun shade to allow proper setting and curing of cement-based materials.

3 Protect excavations and building materials from freezing.

4 Provide and maintain adequate temporary pumping and drainage systems to keep excavations and structures free of water. Prevent flow of surface water into excavations. Locate sumps away from foundation elements. Prevent pumped water from carrying soil in suspension in sufficient quantity to cause settlement of adjacent earth. Provide sufficient standby equipment to ensure continuity of pumping system.

5 Prevent sprayed materials from contaminating air beyond application area by providing temporary enclosures.

6 Cover or wet down dry materials and rubbish to prevent blowing dust and debris.

11. Signs

1 Except as specified here do not erect any signs unless approved by the consultant.

2 Erect signs relating to safety on the work or mandatory regulation notices.

12. Field Office and Sheds

1 Provide temporary covers, sheds and platforms of weatherproof construction as may be required for protection and preservation of materials, small tools, equipment which may be susceptible to damage.

END

TEMPORARY FENCING

PART 1 - GENERAL

1. General Instructions

1 Comply with the requirements of Division 1.

PART 2 - PRODUCTS

1 Pre- fabricated modular steel unit (6’ x 10’)

Fast Fence by Fast Fence Inc.

61 Melford Drive, Toronto, Ontario M1B 2G6

Telephone: 416-751-7877

Facsimile: 416-751-2777

2 Anchoring devices shall be steel pegs or sand bags.

3 Alternate fence supplier to be submitted for approval.

PART 3 - EXECUTION

1 Install temporary fence as detailed.

2 The work must be in place prior to commencement of any earthwork activity.

3 Maintain this fence for the duration of the work.

4 Remove product from site when permitted by the consultant and the Authority having jurisdiction.

5 Inspect regularly and ensure anchoring devises are intact.

END

PART 1 - GENERAL REQUIREMENTS

1. Product Quality

1 Products supplied for work shall be new, and as far as possible, and unless otherwise specified, of Canadian manufacture.

2 Materials used for temporary facilities are not required to be new, provided they are structurally sound, and in suitable and safe operational condition.

2. Standards and Terminology

1 Where a standard has been adopted by these specifications, incorporate minimum requirements of such standard into the work. Where requirements of specifications are more stringent than those of the standard, follow more stringent requirements.

2 Reference to standards, specifications, handbooks and manufacturer's catalogues, refer to latest edition thereof and all amendments or revisions applicable at tender closing date, unless date suffix is included with document number.

3 Wherever words "acceptable", "approved", "satisfactory", "selected", "directed", "designated", "permitted", "inspected", "instructed", "required", "submit", or similar words or phrases are used in standards or elsewhere in contract documents, it shall be understood that "by (to) the consultant" follow, unless context provides otherwise.

4 Where the word "provide" is used in these contract documents, it shall be taken to mean "supply and install" unless specifically noted otherwise.

3. Availability and Substitution

1 Products, which are specified by their proprietary names or by part of catalogue number, form the basis for contract. No substitutes for these may be used without approval in writing under the conditions for an alternative or approved equal as set-out in Section 4, herein. Where more than one product is listed in a specification, the contractor is free to use any of the listed products.

2 Where it is found that specified materials have become unavailable for incorporating into work, notify consultant immediately of proposed substitution as outlined in Section 4 herein.

3 Proposed substitution shall be any top-quality product considered by the consultant to be suitable for purpose intended.

4 Products proposed as substitutions, and which are considered by consultant to be suitable for purpose intended, but which are in his opinion of lesser

value or quality than those specified shall only be accepted as substitution if reasonable credits are allowed for their use.

5 Prevent any substitution or request for substitution from delaying construction progress in any way.

6 Requests for substitution resulting from failure to place orders in time will not be entertained. Be responsible for ordering products in time to ensure their required delivery; bear all costs for failure to comply with these requirements.

7 Upon consultant's request submit copies of material and equipment purchase orders.

4. Product Substitution Procedures

1 Substitution Procedures: Products may be substituted for one or more of the following reasons:

1. Insolvency of the product manufacturer.
2. Inability of the manufacturer to provide the product(s) in the timeframe required to maintain the construction schedule.
3. Product specified has been discontinued.
4. Substitution proposed offers better performance than that specified, at no additional cost.
5. Substitution offers equivalent performance to that specified, at a reduced cost to the Owner (reduction in Contract Price).

2 Items 1.2 and 1.3 above will require a letter from the manufacturer, confirming their inability to provide the products specified, or inability to meet the schedule.

3 Items 1.4 and 1.5 above will be at the discretion of the Owner.

4 Alternative to provide a complete description of the alternative proposed including product name, name of manufacturer, technical data, warranty information, and relevant standards, and samples of both the specified and proposed substitute items at no cost to the Municipality. Any bidder wishing to be considered equal must demonstrate they meet the definition through point-by-point technical comparison listing attributes of the specified product alongside the attributes of the proposed replacement. Where applicable, the alternative request must be accompanied with a local installation location that can be reviewed and written reference from the owner or the owner’s representative for that location.

5 During the tender period substitution requests must be submitted one (1) week prior to the tender close date to the municipalities purchasing department contact as noted in the General Conditions. After tender award su

bstitution requests must be submitted to the Municipality's project manager.

6 Whenever a substitute is proposed, any change to contract price as a result of acceptance of proposed product shall include any adjustments to adjacent structure or space in order to accept minor differences in size or weight between proposed items and corresponding specified items.

7 Prevent any substitution or request for substitution from delaying construction progress in any way.

8 Requests for substitution resulting from failure to place orders in time will not be entertained. Be responsible for ordering products in time to ensure their required delivery; bear all costs for failure to comply with these requirements.

9 Upon consultant's request submit copies of material and equipment purchase orders.

5. Product Delivery, Handling & Storage

1 Suitably pack, crate and protect products during transportation to site to preserve their quality and fitness for purpose intended.

2 Store products in original, undamaged condition with manufacturer's labels and seals intact until they are being incorporated into completed work.

3 Handle and store materials in accordance with manufacturer's and supplier's recommendations so as to ensure preservation of their quality, appearance and fitness for work.

4 Arrange materials so as to facilitate prompt inspection, and remove faulty, damaged or rejected materials immediately from site.

6. Product Delivery Schedule

1 It is the responsibility of the contractor to ensure that the supplier or distributor of materials specified, or alternatives accepted, which he intends to use, has materials on the site when required. The contractor shall obtain confirmed delivery dates from the supplier.

2 The contractor shall contact the consultant immediately upon receipt of information indicating that any material or item will not be available on time, in accordance with the original schedule, and similarly it shall be the responsibility of all subcontractors and suppliers to so inform the contractor.

3 The consultant reserves the right to receive from the contractor at any time, upon request, copies of actual purchase or work orders of any material or products to be supplied for the work.

7. Workmanship

PRODUCTS AND WORKMANSHIP

1 All work shall be carried out in accordance with the best trade practice, by workers skilled in the type of work concerned.

2 Products, materials, systems and equipment shall be applied, installed, connected, erected, used, cleaned and conditioned in accordance with the applicable manufacturer's printed directions.

3 Where specified requirements are in conflict with the manufacturer's written directions, follow manufacturer's directions. Where specified requirements are more stringent than manufacturer's directions, comply with specified requirements.

END

ABBREVIATIONS

PART 1 - GENERAL REQUIREMENTS

1 When the following abbreviations are used in the contract documents, they shall have the meanings shown.

ABBREVIATION	MEANING
AA	The Aluminium Association
ACI	American Concrete Institute
AODA	Accessibility for Ontarians with Disabilities Act
ASTM	American Society for Testing and Materials
AWPA	American Wood Preservers Association
AWS	American Welding Society
CCA	Canadian Construction Association
CCRC	Canadian Code for Residential Construction
CEC	Canadian Electrical Code
CFUA	Canadian Fire Underwriters Association
CGA	Canadian Gas Association
CGSB	Canadian General Standards Board
CIQS	Canadian Institute of Quantity Surveyors
CISC	Canadian Institute of Steel Construction
CITC	Canadian Institute of Timber Construction
CLA	Canadian Lumbermen's Association
CMHA	Canada Mortgage and Housing Corporation
COFI	Council of Forest Industries of British Columbia
CPCI	Canadian Pre-stressed Concrete Institute
CSA	Canadian Standards Association
CSC	Construction Specification Canada
CSI	Construction Specifications Institute (USA)
CSPI	Corrugated Steel Pipe Institute
CUA	Canadian Underwriters' Association
CWB	Canadian Welding Bureau
CWC	Canadian Wood Council
IES	Illuminating Engineering Society
LTIC	Laminated Timber Institute of Canada
NBC	National Building Code of Canada
NBS	National Bureau of Standards USDC
NLGA	National Lumber Grades Authority
NRCC	National Research Council of Canada
PCA	Portland Cement Association
PCI	Pre-stressed Concrete Institute
RAIC	Royal Architectural Institute of Canada
ULC	Underwriters' Laboratories of Canada

END

WARRANTIES

PART 1 - GENERAL REQUIREMENTS

1. Definition

1 Warranty = Guarantee

2. Submission Requirements

1 Submit extended warranties as part of "Operation and Maintenance Manuals" in accordance with requirements of Section 01 77 00 - Project Closeout.

2 Arrange extended warranties in systematic order matching specification format. Include a table of contents listing warranties in same order.

3. Each warranty must show:

1 Name and address of project

2 Name of owner

3 Section Number and Title

4. Warranties

1 All work shall be guaranteed for 2 years from date of Substantial Completion. Plant materials shall be guaranteed for 2 years from date of Substantial Completion pursuant to the following requirements.

1. All dead woody plant materials will be replaced promptly by the contractor for the entire duration of the warranty period. All warranty replacements will be made at the expense of the contractor and at no additional cost to the Owner.
2. Plants dying as a result of, but not limited to, handling by nurseries or the contractor, improper storage, improper planting, lack of water or rodent damage will be subject to replacement.
3. Plants dying as a result of vandalism whether intentional or accidental are not subject to warranty replacement by the contractor.

END

CLEANING

PART 1 - GENERAL REQUIREMENTS

1. General

1 Be responsible for cleanliness of site and structures to satisfaction of consultant. Maintain work in neat and orderly condition at all times.

2 Periodically, or when directed by the consultant, remove from site and legally dispose of rubbish and waste materials.

3 Burning or burying of rubbish and waste materials on site is not permitted.

4 Use cleaning material only on surfaces recommended by cleaning material manufacturer.

5 While on the premises, all hazardous waste shall be properly identified and stored so as not to pose a safety hazard to employees, workers, or the general public.

6 Utilize recycling programs and efforts for material disposal whenever and wherever possible. Guidance into various recycling efforts can be obtained by contacting the Municipality and Region.

2. Cleaning During Construction

1 Remove debris, packaging, and waste materials frequently.

2 Keep dust and dirt to an acceptable level as directed.

3 Remove oily rags, waste, and other hazardous substances from premises at close of each day, or more often if required.

3. Final Cleaning

1 Prior to substantial performance, thoroughly clean all surfaces and components. Provide professional cleaning of all areas and surfaces to allow owner to occupy without further cleaning.

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

END

PROJECT CLOSEOUT

PART 1 - GENERAL REQUIREMENTS

1. Operating and Maintenance Manuals

1 Provide operating and maintenance data, prepared in digital form and on 8 1/2" x 11" sheets in printed or typewritten form, preferably double-sided, contained in D-ring binders with vinyl covers.

2 Manual contents shall be assembled in systematic order generally following the specification format. Provide labelled, celluloid covered tabs fastened to hard paper dividers to identify different sections.

3 Binders shall have clear plastic pocket at back of spine for identification. Insert label containing title "Operating and Maintenance Data", project name and volume number if applicable.

4 Include the following material in each manual:

1. Title sheet labelled "Operating and Maintenance Data" and listing project name, date, volume number, if applicable and names and addresses of contractor, mechanical subcontractors, consultant and sub-consultants.
2. List of contents. If more than one volume is required, provide a cross-reference contents page at front of each volume.
3. Complete list of subcontractors and suppliers.
4. Copy of finished hardware list, complete with all amendments and revisions.
5. Schedule of paints and coatings. Include sufficient explanation to fully identify each surface with the applicable paint or coating used. Enclose copy of colour schedule.
6. Maintenance instructions for all finished surfaces.
7. Brochures, cuts of all equipment and fixtures.
8. Operating and maintenance instructions for all equipment.
9. Extended warranties.
10. Maintenance contracts.
11. Other data required elsewhere in contract documents or deemed necessary by consultant.
12. Complete document in digital format and provided on a USB memory device.

2. Record Drawings

1 Upon completion of work, prior to total performance, obtain and pay for one set of mylar transparencies and transfer record information compiled during construction from white prints to mylars. Co-ordinate with consultant and

have 'As-Built' drawings prepared in minimum Autocad 2015 format. Submit a digital copy of 'As-Built" drawings to the Municipality

3. Operating Instructions

1 At substantial performance, at a time acceptable to owner and consultant, but not before operating and maintenance manuals have been reviewed and accepted by consultant, instruct owner's representative in the operation of all systems and equipment. Substantial Performance

2 Prior to requesting a substantial performance deficiency inspection, submit the following:

1. Three copies of operating and maintenance manuals.
2. Two copies of inspection and acceptance certificates required from regulatory agencies.

3 Advise the consultant, in writing, when the project has been substantially completed. If consultant agrees that this stage has been reached, prepare a complete list of deficiencies, and submit one copy of this list to consultant.

4 On receipt of the above deficiency list, in a satisfactory form, the consultant, accompanied by the sub-consultants, the contractor and his project superintendent, and the owner if deemed desirable, will carry out an inspection of the project.

5 Add to the deficiency list, in accordance with consultant's directions, any additional deficiencies which are identified during inspection and re-issue updated deficiency list to all concerned.

4. Total Performance

1 Prior to requesting a final inspection, do the following:

1. a) Submit one complete set of mylar record drawings.
2. b) Submit one complete set of reviewed shop drawings of mechanical and electrical items, folded to 8½" by 11" size, contained in heavy manila envelopes, numbered and labelled. Follow specification format with no more than one section per envelope.

2 Submit a final request for payment incorporating all approved changes to the contract price, including adjustments to the cash allowances listed in Section 01 21 00 - Allowances.

3 Upon completion of all items noted on the deficiency list, clean all areas, surfaces and components affected by corrections and completion of deficient items, as directed by the consultant.

4 Ensure that all services, equipment, apparatus are properly tested and adjusted.

5 After all deficiencies have been corrected, submit a written request to the consultant for a final inspection. This inspection shall be carried out by the same parties involved in the substantial performance deficiency inspection.

6 If all deficiencies have not been corrected, in the opinion of the consultant, a final deficiency list will be prepared in the same manner as specified herein for the substantial performance deficiency inspection and the inspection procedure repeated until all items have been completed to the satisfaction of the consultant.

END

DEMOLITION

PART 1 - GENERAL

1. General Instructions

1 Comply with the requirements of Division 1.

2. Related Work

1 Earthworks Section 34 14 11

3. Regulatory Requirements

1 Obtain and pay for necessary permits for work of this section. Give required notices.

2 Comply with applicable requirements of the following:

1. CSA S350-M1980 "Code of Practice for Safety in Demolition of Structures"
2. Ontario Building Code (OBC)
3. Canadian Construction Safety Code
4. Authorities having jurisdiction

4. Protection

1 Prevent damage to trees scheduled to remain. All existing trees to remain.

2 Prevent debris from blocking surface drainage courses and inlets.

5. Examination

1 Visit the site so as to fully understand all existing conditions and extent of work required. No increase in cost or extension of performance time will be considered for failure to know conditions.

PART 2 - PRODUCTS Not applicable

PART 3 - EXECUTION

1. DEMOLITION

1 Demolish existing work on site of work as indicated by plan.

2 Demolish work in a safe and systematic manner.

3 Demolish in a manner to minimize dusting. Keep dusty materials wetted but prevent flooding or contaminated run-off.

2. Disposal and Clean Up

1 All materials, rubbish and debris resulting from demolition work shall become the contractor's property and shall be removed from the site and legally disposed of unless specified otherwise.

2 Do not allow demolished materials to accumulate on site. Promptly remove materials from the site as work progresses.

3 Selling, burning or burying of materials on site is not permitted.

4 Leave site in clean condition with all required guards in place.

END

CAST IN PLACE CONCRETE

PART 1 - GENERAL REQUIREMENTS

1. Description

1 This specification covers the furnishing of all skilled labour, materials, equipment, and services required to supply and install poured concrete pavements and structures in the locations and to the details indicated by the plans; and as specified hereinafter.

2 Comply with requirements and conditions of the Municipality. Invitation to Tender, Division1; the General Conditions of Contract; Supplementary Conditions and any requirements of Special Provisions applicable to this section of the work.

2. Scope of Work

1 The major work required to complete is as follows:

1. Excavations as required to establish grades and slopes of pavement structures.
2. Installation and compaction of sub-base materials to the compacted thicknesses as described by the plans and details.
3. Erection of formwork in accordance with the specifications to produce the dimensions and shapes described by the plans and details.
4. All special and additional concrete work requirements as described by the details and design drawings.
    1. Read drawings in conjunction with the specification and all other contract documents.
    2. Before proceeding with work, check all the dimensions shown on the drawings with the landscape drawings and report discrepancies to the consultant.
    3. Typical structural details shall govern the work. If details differ on the drawings, the most stringent shall govern.
5. Removal and legal disposal of any excess and waste materials from the site.
6. Protection of trees, structures and the work of others during the work described herein.
7. Cleaning of the final products and reinstatement of work area as required by the contract administrator.
8. In addition, it is required that incidental and minor items indicated, specified or implied by the nature of this type of work be completed within the scope of this specification.

9. All reinforced concrete elements have been designed in accordance with CSA Standard A23.3.

10. All structural steel elements have been designed in accordance with CAN/CSA-S16.

11. All separate concrete pours are to be connected with approved slip-dowels installed at 900mm on centre.

3. Related Work

1	Earthworks	Section 31 14 11
2	Site Furniture	Section 32 37 00

PART 2 - PRODUCTS

1. General

1 Cement shall be a standard grey Portland cement conforming to CSA-A.5. Ready Mix may be used as an alternative if approved by the Municipality.

2 Water shall be clear and free from injurious amounts of oil, acid, alkali, organic matter, sediment, or any other deleterious substances in accordance with CSA- A23.1.

3 Aggregates shall meet the requirements of CSA-A23.1.

4 Chemical concrete admixtures may be used only when approved by the landscape architect and shall then meet the requirements of ASTM-C494 and shall be used only in accordance with the manufacturer's recommendations.

5 Air-Entraining admixtures shall conform to ASTM-C260.

6 Reinforcement re-bar and wire mesh shall be in accordance with CSA-G.30.

7 Expansion joint fillers shall be an approved bituminous, pre-moulded fibre joint filler conforming to ASTM-D1751 or approved self-expanding cork conforming to ASTM-D.1752, or closed cell polypropylene foam expansion joint filler, Deck-O-Foam by W.R. Meadows or approved equivalent.

8 Slip-Dowels: These shall be a genuine and approved manufactured product for the purpose. Individual metal rods or rebar of any kind shall not be deemed as acceptable to the requirements of the contract.

9 Granular base course materials shall be of clear, natural crushed stone, rock or gravel, or Granular "A" in accordance with OPS Form No. 1010.

10 All materials for poured in place concrete shall be proportioned and mixed so as to produce a mix meeting the following requirements, and in accordance with CSA-A23.9. and shall incorporate the following requirements:

1. Strength at 28 days or as detailed
2. Aggregate 5mm minimum & 20mm maximum
3. Maximum 75 mm slump at point of deposit
4. Air Entrainment 6%.
5. Exposure Class C1 for reinforced concrete
6. Exposure Class C2 for non-reinforced concrete.
7. Joint Sealers: Expansion joint sealant to be a self leveling, elastometric sealing compound by 3M or approved equal.
    1. Colour to match concrete finish.
8. Rebar, as detailed for cast-in-place concrete stairs.

2. Tactile Warning Strip Indicators

1 Advantage Cast Iron Plate" by Kinesik Engineering Products (or approved equal). Do not powdercoat.

1. Kinesik Engineered Products Incorporated
   Sheridan Research Park,
   2213 North Sheridan Way
   Mississauga, Ontario L5K 1A3
   Email: orderdesk@kinesik.ca
   Phone: (855) 364-7763

3. Stair Nosing

1 Stair Nosing to be Model No. 121BF by Wooster Products Inc., (Or approved equal).

1. 1000 Spruce Street
   PO Box 6005
   Wooster, OH 44691
   Phone: 800-321-4936

4. FINISH

1 Concrete pathways and paving, and curbs:

1. Light Broom Finish with trowelled edges (5mm radius edge), no visible margins.
2. Brush away trowel marks to have consistent light broom finish from edge to edge.
3. Provide a light broom finish on all exposed surfaces of playground curb, parallel to with curb face.

2 Structural Concrete including cast-in-place concrete stairs.

1. Concrete steps to receive a trowel finish to be approved with no visible tooled edges.

5. Forms

1 Wood, or metal forms, or sono tube forms as applicable to the works capable of producing a smooth flat finish. Form work to be profiled to suit conditions.

2 Joint Filler: Asphalt Impregnated fibreboard, 8mm thick ASTM D1751.

PART 3 - EXECUTION

1. Placement and Preparation

1 Remove soft and unstable areas in sub-grade and backfill and compact with approved granular material.

2 Compact sub-grade uniformly to minimum 98% Standard Proctor Maximum Dry Density (S.P.M.D.D.).

3 Place granular base course materials to the specified minimum depths as detailed.

4 Keep granular materials clean and free of deleterious materials at all times.

5 Maintain final grade of granular base course parallel to finished grade and obtain approval of base before proceeding with work.

6 Submit all written test reports.

7 Comply with CSA-A23.1 with respect to conveying and placing of concrete.

8 Transport concrete from mixer to point of deposit and deposit in its final position as quickly as possible to prevent separation and loss of materials.

9 Do not use re-tempered concrete or concrete which has been contaminated by foreign substances.

10 Place concrete in a continuous operation until section is completed or between joints. When required, place construction joints in accordance with CSA-A23.1.24.

11 Consolidate concrete, by approved means, while it is being placed. Thoroughly work concrete around reinforcement and embedded fixtures and into corners of forms.

12 Maintain constant quality control to ensure that finished concrete is dense, uniform and free of honey-combing and that no separation of materials can occur.

13 Place expansion joints where shown on drawings and as detailed.

14 Do not continue reinforcing bars through expansion joints but stop on either side of joint. Provide connection dowels at joint locations.

15 Install joint filler as detailed and to the specified depth. Expansion joint shall be true to line and plumb.

16 Seal expansion joints as soon as curing of concrete has been completed.

17 Saw cut control joints to be at intervals of 3m or as shown on plan.

18 Apply sealant in strict accordance with manufacturer's recommendations. Clean joints thoroughly before sealing and remove all laitance.

2. Weather Protection

1 During cold weather protect concrete and concreting operations in accordance with CSA-A23.1.19.

2 During hot weather comply with the requirements of AC1-605.

3. Curing

1 After concrete has sufficiently set, keep exposed surfaces continuously moist for at least seven (7) days.

2 Concrete shall be moist-cured with the use of burlap, or an approved equal, which shall be thoroughly wetted when applied and kept moist continuously during the curing period.

3 The use of curing compounds must be approved by the consultant and shall then meet the requirements of ASTM-C309.

4 Curing compounds shall be approved and shall be applied in strict accordance with the manufacturer's recommendations, or as directed.

4. Admixtures

1 It is the contractor’s full responsibility to adjust the proportioning and/or admixtures in order to prevent cracking, spalling, etc. due to weather or any other reason. Submit written report from supplier when doing so.

5. Repairs

1 Curb cracking may be repaired by sawcut only if done in a vertical position otherwise break-out and re-pour new concrete.

2 Repair all concrete curbs before final course of asphalt is laid where applicable.

6. Testing

1 Concrete testing shall be done by taking three (3) concrete control cylinders for each fifty (50) metres of concrete placed but, in any event, not less than one (1) test for each day concrete is poured.

2 Cylinders shall be taken from the concrete as it is delivered to the job site in the presence of, and as directed by, the testing engineer.

3 Cylinders shall be cured under laboratory conditions and shall be tested for compressive strength, slump and air content, in full accordance with CSA-A23. One cylinder shall be tested at seven (7) days and two cylinders at twenty-eight (28) days.

4 All freshly mixed concrete shall be tested for air content at time of placement, in accordance with CSA-A23.2.19.

5 Be responsible for the costs of all such tests and of additional tests resulting from:

1. failure of test specimens to meet specified requirements.
2. changes in materials, proportions and mix design and supply when requested by the contractor.
3. re-testing due to failure of test specimens.

6 Submit complete, written test reports to the consultant.

END

METAL FABRICATIONS

PART 1 - GENERAL

1. General Instructions

1 Comply with requirements of Division 1.

2. Related Work

1	Submittals	Section 01 33 00
2	Cast in Place Concrete	Section 03 30 00

3. Reference Standards

1 Do welding work in accordance with CSA W59-1982 unless specified otherwise.

2 Galvanizing to conform to CSA G164-M1981.

4. Shop Drawings

1 Submit shop drawings in accordance with Section 01 33 00 - Submittals.

2 Indicate materials, core thicknesses, finishes, connections, joints, method of anchorage, number of anchors, supports, reinforcement, details and accessories.

PART 2 - PRODUCTS

5. Materials

1 Steel tubing to CSA-G40.21-M, Grade 350 W, Class H.

2 Steel sections and plates: to CAN3-G40.21-M81, Grade (300W) (350W).

3 Steel pipe: to CSA B63, standard weight galvanized finish.

4 All steel shall be new product solid or hollow as detailed. All steel to be galvanized and acid etched before finishing.

5 Welding materials: to CSA @59-1982. Steel butt welding to conform to CSA 2241.10.

6 Bolts and anchor bolts: to ASTM A307-82a.

7 Galvanizing: hot dipped galvanizing with zinc coating (600)g/m^2 to CSA G164-M1981.

8 Zinc primer: zinc rich, ready mix to CGSB 1-GP-181M+Amdt-Mar-78.

9 Stainless Steel:

1. Unless specified otherwise on the Drawings or in the Contract documents, the stainless steel shall be Grade 316 (UNS S31600) or Grade 316L (UNS S31603).
2. Material manufactured to other equivalent standards will be accepted, provided that the material also complies with the appropriate ASTM standards.
3. Stainless steel which is bent, corroded or damaged must not be used.
4. Where practical, the grinding of a surface defects must produce a surface roughness similar to the finish on surrounding areas.
5. Any significant surface defect areas corrected by grinding must not be located on the outside (visible) surface of outside members. In a corrosive environment, the Ra of the ground area must not exceed 0.5µm.
6. Weld repairs to materials are not permitted.

6. Fabrication

1 Build work square, true, straight and accurate to required size, with joints closely fitted and properly secured.

2 Fabricate items from steel unless otherwise noted.

3 Use self-tapping shake-proof oval-headed screws on items requiring assembly by screws or as indicated.

4 Where possible, fit and shop assemble work, ready for erection.

5 Ensure exposed welds are continuous for length of each joint. File or grind exposed welds smooth and flush.

7. Finishes

1 All steel shall be primed and painted per schedule on plans.

2 Apply one shop coat of primer to metal items, with the exception of stainless steel, aluminium, galvanized or concrete encased items.

3 Use primer unadulterated, as prepared by manufacturer. Paint on dry surfaces, free from rust, scale, grease. Do not paint when temperature is lower than 7°C.

4 Clean surfaces to be field welded; do not paint.

PART 3 - EXECUTION

1. Preparation and Examination

1 Notify consultant prior to start of installation in case of conflict.

2 Remove debris and correct ground undulations at sign locations.

2. Erection

1 Erect metalwork square, plumb, straight and true, accurately fitted, with tight joints and intersections.

2 Provide suitable means of anchorage acceptable to consultant such as dowels, anchor clips, bar anchors, expansion bolts and shields and toggles.

3 Make field connections with bolts to CSA S-16-1969 and CSA S1653-1981, or weld.

4 Hand items over for casting into concrete or building into masonry to appropriate trades together with setting templates.

5 Touch-up rivets, field welds, bolts and burnt or scratched surfaces after completion of erection with primer.

6 Touch-up galvanized surfaces with zinc primer where burned by field welding.

3. Touch-Up

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

.

END

PAINTING

PART 1 - GENERAL

1. General Instructions

1 Comply with requirements of Division 1.

2. Related Work

1	Cast in Place Concrete	Section 03 33 00
2	Metal Fabrications	Section 05 50 00

PART 2 - PRODUCTS

1. Acceptable Manufacturers

1 Unless otherwise specified, materials shall be manufactured and supplied by one of the following:

1. Benjamin-Moore & Co. Ltd.
2. Canadian Industries Ltd.
3. Glidden Co. Ltd.
4. Monarch Paints Inc.
5. Pratt & Lambert Inc.
6. The Sherwin-Williams Co. Ltd.

2 Suppler for FDK outdoor activities shall be:

1. Pavement Solutions Inc.
   26-1730 McPherson Court
   Pickering, ON L1W 3E6
   Toronto: 416-750-0516
   Durham Region: 905-619-0095
   sales@pavementsolutions.ca

2. List of Materials and Samples

1 List of materials shall be endorsed by manufacturer as being the best material for the applicable condition.

2 Do not order material or commence work until list of materials is approved by consultant.

3 Submit 2 - 100 mm x 200 mm colour chips of each paint colour coated with manufacturer's paint system to confirm colour match.

3. Product Handling

PAINTING

1 Deliver paint materials to site in sealed original containers bearing manufacturer's name, brand name, type of paint and colour designation.

2 Store materials in strict accordance with manufacturer's recommendation.

4. Materials

1 Materials shall be "top line quality" products and shall be supplied by a single manufacturer except for speciality products not available from paint manufacturer.

2 Paints shall be factory mixed unless otherwise specified except any coating in paste or powder form, or to be field-catalyzed shall be field mixed in accordance with manufacturer's directions.

3 Primers shall be as specified by manufacturer and fully compatible with finish coats.

PART 3 - EXECUTION

1. Preparation of Substrates

1 Fill minor cracks, holes and fissures with polyfills and smooth to a flush surface. Texture filled areas to match surrounding surface.

2 Alkalinity: test cementitious substrates for alkalinity. Use method recommended by coating manufacturer.

2. Quality Control

1 Do not apply exterior coatings during periods of precipitation or when precipitation is imminent.

2 Do not apply coatings under direct sunlight during hot weather.

3 Protect adjacent surfaces not scheduled to receive coatings from damage.

4 Post "wet coating" signs and "no smoking" signs while work is in progress and while coatings are curing.

5 Keep oily rags, wastes and other combustible materials in closed metal containers and remove at the end of each work day. Take every precaution to avoid spontaneous combustions.

6 Unless otherwise permitted, apply coatings only after all other Sections have completed their work.

3. Coating Application

1 Apply paint by brush or roller.

2 Spray painting may be permitted where deemed advantageous and shall be subject to approval; but when permitted, use only airless spray guns.

3 Applied and cured coatings shall be uniform in thickness, sheen, colour and texture and free of brush or roller marks, sags, crawls and other defects detrimental to appearance and performance.

4 Regardless of the number of coats specified for any surface, apply sufficient paint to completely cover and hide substrate and to produce a solid uniform appearance.

5 Thoroughly mix materials before application. Use same brand of paint for primer, intermediate and finish coats.

6 Where two or more coats of same paint are to be applied, undercoats shall be tinted in light shades of final coat to differentiate from final coat.

7 Touch up suction spots after application of first coat. Sand lightly between coats with fine sandpaper.

8 Each coat of finish shall be dry and hard before succeeding coats are applied with a minimum of 24 hours between coats unless manufacturer's instructions state otherwise.

4. Patching

1 Prior to takeover of project by owner, inspect work of this Section and touch-up or refinish damaged finishes and finishes which are unsatisfactory.

END

TRAFFIC SIGNAGE

PART 1 - GENERAL REQUIREMENTS

1. General Instructions

1 Comply with requirements of Division 1.

2. Related Work

1 Cast in place Concrete Section 03 30 00

PART 2 - PART 2 - PRODUCTS

1. Signs:

1 Locations and type where indicated on the drawings

PART 3 - EXECUTION

1. Installation

1 Install all products in locations shown and in accordance with manufacturer's instructions using galvanized mechanical fasteners.

END

EARTHWORKS

PART 1 - GENERAL REQUIREMENTS

1. Description

1 This specification covers the furnishing of all labour, materials, equipment and services required to provide the necessary earthworks and excavation to construct trails, pathways and structures to the extent indicated by the plans and as specified hereinafter.

2 Comply with requirements and conditions of the Municipality Request for Tender, Division1; the General Conditions of Contract; Supplementary Conditions and any requirements of Special Provisions applicable to this section of the work.

2. Scope of Work

1 The major work required to complete is as follows:

1. Stripping and conservation in stockpiles of topsoil needed for finishing, and excavation for pathways and site features as is required by the plans and site directions.
2. Import, placement and compaction of fill and topsoil materials to meet designed grades.
3. Excavation as required and engineering of sub-surface soils to support parking structures and site features as described by the plans and the shop drawings or working drawings approved for those structures.
4. Removal and legal disposal of any excess cut materials from the site.
5. Protection of trees, structures and the work of others during the work described herein.
6. The maintenance of all sediment control structures and installations relevant to the works of the site, including those installed by others.
7. Cleaning and reinstatement of work area as required by the contract administrator.
8. In addition, it is required that incidental and minor items indicated, specified or implied by the nature of this type of work be completed within the scope of this specification.

PART 2 - PRODUCTS

1. Not applicable

PART 3 - EXECUTION

1. Existing Site Conditions

1 As a part of the preparation of its tender, the contractor has reviewed and made known, the acceptance of the site contour relative to the graphic contour shown on the plans.

2 The contractor is required to strip topsoil in the appropriate areas of the site and adjust grades where necessary to achieve a working and draining rough sub-grade of the needed sectional subgrade levels for pavements and features of the site.

The Contractor shall verify grades on the site and review the existing conditions survey and grading plan provided along with the soils report. The contractor is required to make additional adjustments to sub-grades as necessary to achieve appropriate depth of engineered sub-grade for hard surface base materials.

The contractor is expected to understand the need for sub-excavation in soft landscape areas of the site to generate the necessary materials that will be required to prepare sub-grade elsewhere. Particular note is to be made of the requirements of the bidder to ensure sub-grade preparation below paved plazas to achieve the required sub-grade bearing resistance as detailed.

3 Failure to report discrepancies in writing will imply acceptance by the contractor of surfaces and conditions, and no claim made thereafter for damages or extras resulting from such surfaces and conditions will be accepted.

2. Topsoil Stripping / Placement

1 Strip all in-situ topsoil and vegetative cover material, which occur below proposed paved areas and structures. Areas not requiring significant grade change may utilize existing and imported topsoil to achieve finished grade. For the grading works of the park it is anticipated that all topsoil will be stripped and stockpiled in “stockpiles” in the approximate locations as illustrated by the plans for redistribution in the cut/fill exercise and finishing works for the project. The loading, hauling and placing of this and other material is to be anticipated in the bid as submitted for this project.

2 Contractor shall place topsoil to a minimum depth of 300mm to finish the soft landscape elements in sodded and 150mm for seeded areas of the project though greater depth is acceptable. Topsoil stripped from the site is to be tested for horticultural capabilities by the contractor and amended in

accordance with test results for organic content. Imported topsoil for the planting works is to be from approved sources and testing reports submitted for approval by the contract administrator prior to the start of any importing operations for topsoil.

3 All topsoil material both on-site and imported is to be tested by the contractor and the costs of such tests incorporated within the base-bid tendered by the contractor for the works of this contract. Topsoil for fine grading shall have pH value of 6.5-7.5, and be free from subsoil, roots, vegetation, debris, toxic materials, or stones over 25 mm diameter.

3. Cut and Fill Balance

1 The plans have been prepared with the general intention to produce a balance of in-situ topsoil and fill materials and an import of construction materials and aggregates for pavement and other construction. The understanding and calculation of the balancing of cut/fill within the local site areas and the establishment of bearing soil for sub-grade for paving and features through analysis of the soils report and drawing examination is the contractor's responsibility.

2 It is the intention of the contract to sub-excavate within the site as may be required in order to generate needed materials for compacted sub-grade surface in compliance with the applicable works and the related sections of the specifications. Completely consume and retain the on-site materials to finish the works inasmuch as may be possible through reviewed grade adjustments in the field to avoid unnecessary exports of materials.

3 It is to be the bidders' sole responsibility to evaluate and understand the needed grading program to achieve the grades described by the drawings. Supply and place all suitable materials and execute the works as is necessary to bring the grades to the finished elevations. The contractor is responsible to plan grading programmes to excavate and produce from the site the needed "engineer-able" and structural fill required to prepare the area of the park shelter building, playground, waterplay facilities, washroom building and plaza areas.

4. Filling

1 Unless otherwise specified, the contractor shall, where required, supply and spread sufficient fill materials from the site to raise existing grades to the specified level as indicated on the drawings.

2 Such imported fill materials shall be supplied with complete chemical analysis reports to the approval of the consultant and shall be examined and made free of any debris subject to rot or corrosion, and shall be approved by the consultant before placing.

3 Under no circumstances shall topsoil or any other deleterious material be used as fill beneath any structures requiring bearing soils such as footings, slab foundations, paving, walks, steps, playgrounds, etc.

4 Prior to placing fill, the existing grade shall be scarified to a minimum depth of 75mm to provide a good bond and prevent slipping of fill.

5 Fill materials shall be placed in loose layers not exceeding 250 mm in depth (or as noted on the drawings). Each layer shall be compacted to 98% Standard Proctor Maximum Dry Density (S.P.M.D.D.) (or as noted on the drawings) before placing subsequent layers.

6 The preparation of the finished sub-grade, prior to placing of topsoil under sodding, shall be as specified under Section 32 92 23.

7 All fill materials shall be compacted when the moisture content, as determined by laboratory tests, is suitable for obtaining the required density. When the moisture content is too low, water shall be applied by means of an approved distributor. When the material is too wet, it shall be thoroughly mixed with dry material, or the wet material shall be dried by blading, dicing or other approved method.

8 The surface shall be shaped at all times to ensure adequate surface run-off and prevent ponding and scouring.

5. Excavating

1 Before proceeding with excavating work for paving, the areas shall be staked out and approval obtained from the consultant.

2 All areas for paving shall be excavated to the specified depths as indicated on all drawings, details and specifications.

3 The final sub-grade shall be maintained parallel to the finished grade and shall be thoroughly compacted to 98% S.P.M.D.D. minimum.

4 Submit written evidence that the specified compaction has been realized and obtain approval from the Consultant before commencing work.

5 All structures such as walks, steps, etc. shall be staked out on the site to the consultant's approval before commencing excavating work.

6 The excavations for all foundations shall be carried to undisturbed soil, or to a minimum depth of 1200mm unless specified otherwise.

7 The bearing capacity of the soil on which the footings are to be founded shall be tested by a geotechnical consultant to ensure it is capable of supporting the imposed loads.

8 Where the bearing-capacity appears to be insufficient, soil investigations shall be carried-out with the approval of the landscape architect. Costs of such investigations shall be paid for out of the Cash Allowance for testing.

9 Where it is necessary to carry excavations deeper than specified, until a firm bearing is obtained, fill the extra excavation with concrete, OPS compliant SSM and/or granular fill as directed. Under no circumstances will earth filling under small-scale footings be permitted, unless otherwise approved.

10 The cost of extra excavations and extra concrete will be paid for at agreed unit or lump sum prices quoted to the Owner and approved. Where such extra costs are the result of the contractor's error or misinterpretation, no extra payment will be made.

11 All excavations shall be sufficiently shored and braced to prevent caving-in and support existing structures, roads, services, etc.

12 All shoring shall be done in strict accordance with local regulations and approval obtained from local authorities.

13 Warning signs and protective barriers shall be erected in accordance with local regulations.

14 The Contractor shall be responsible for all damages and subsequent repairs to underground utilities and structures resulting from contractor's operations.

15 All excavations shall be protected from freezing and water. Provide and operate as many pumps as are necessary to keep excavations free of water at all times.

16 All surplus excavated material shall be removed and disposed of, unless approved by the consultant for filling or backfilling. Surplus material and unacceptable materials shall be removed from the site and disposed.

17 All excavated rocks less than 600mm dia. and boulders shall be immediately removed from the site.

END

ASPHALT PAVING

PART 1 - GENERAL REQUIREMENTS

1. Description

1 This specification covers the furnishing of all skilled labour, materials, equipment and services required to supply and install compacted asphalt pavements in the locations and to the details indicated by the plans; and as specified hereinafter.

2 Comply with requirements and conditions of the Request for Tender, Division1; the General Conditions of Contract; Supplementary Conditions and any requirements of Special Provisions applicable to this section of the work.

2. Scope of Work

3 The major work required to complete is as follows:

1. Excavations as required to establish grades and slopes of pavement structures.
2. Installation and compaction of sub-base materials and asphalt pavement materials and mixtures to the compacted thicknesses as described by the plans, details and in conformance with OPS and OPSD as applicable.
3. It is to be noted by the contractor that pavement mixes shall be pure mixtures with “virgin” asphaltic cement and no RAP materials. Asphalt for pathways can be conventional and typical mixtures to the definitions provided in the construction details and the specifications herein.
4. Removal and legal disposal of any excess and waste materials from the site.
5. Protection of trees, structures and the work of others during the work described herein.
6. Cleaning of the final paving product and reinstatement of work area as required by the contract administrator.
7. In addition, it is required that incidental and minor items indicated, specified or implied by the nature of this type of work be completed within the scope of this specification.

3. Related Work

1	Earthworks	Section 31 14 11
2	Cast in Place Concrete	Section 03 30 00

PART 2 - PRODUCTS

1. Materials

1 The granular base course shall conform to the requirements of OPS Form 1010.

2 Paving mixtures shall be a hot mix, hot laid asphaltic concrete installed to the minimum compacted thickness shown on the details.

3 The mixture shall be composed of coarse and fine aggregates, mineral filler and asphalt cement, uniformly mixed and meeting the gradation requirements specified hereinafter.

4 Coarse aggregates shall be a crushed rock, slag or gravel, or combinations thereof, free of clay, silt or other deleterious materials and meeting the gradation requirements of OPS Form 1010, latest edition.

5 Fine aggregates shall be composed of clean, hard durable particles of natural sand, manufactured sand or screenings resulting from the crushing of rock, stone or gravel. Material shall be free of clay, silt or other objectionable material.

6 The mineral filler shall consist of finely ground particles of limestone, hydrated lime or other mineral dust approved by the consultant. It shall be free of clay, silt or other deleterious matter and shall conform to the following gradation requirements.

	Sieve Size	Percentage Passing
1.	No. 30	100
2.	No. 100	80

7 Asphalt cement shall conform in all respects with OPS Form 301-02-1 (See Appendix A).

8 Where a priming base is required, it shall be homogenous medium curing liquid asphalt, MC - 30.

9 Material for painting the joints shall be slow setting asphalt emulsion, SS - 1, meeting the requirements as set out in OPS Form 301-02-1, Appendix C.

2. Equipment

1 Plant used by the contractor for the preparation of asphalt paving mixtures shall meet the requirements of the OPS Form 310.06.01 to 310.06.02.

2 All equipment required for work described shall be maintained in satisfactory working condition for the duration of the work.

3 Spreading equipment and rollers shall meet the requirements of the OPS Form 310.06.01 to 310.06.02.

4 The contractor shall have copies of the above-mentioned sub-sections on the site for the duration of the work.

PART 3 - EXECUTION

1. Inspection

1 During construction, the density and thickness of each course shall be carefully controlled and shall be in full accordance with the drawings and specifications. The Geotechnical Consultant shall be given 24 hours' notice of paving operations and shall be in attendance at the site to monitor temperature and thickness of the pavement courses.

2 The average thickness of each course shall at no point vary more than 6 mm from the specified thickness as shown in the plans and details.

3 The density of the completed pavement shall be equal to or greater than 98% S.P.M.D.D.

4 Each course shall be inspected and tested for density and thickness to the approval of the consultant before placing subsequent courses.

5 Asphalt paving shall receive final inspection by the consultant upon completion of all asphalt work.

6 The surface of the finished paving shall be true to grade as shown on drawings and shall be free of irregularities exceeding 3 mm as measured with 3000 mm straight-edge parallel to the centre line of the paving.

7 All defective areas shall immediately be remedied by cutting out the course, as required, and replacing it with fresh, hot mix which shall immediately be compacted to conform to the surrounding paving and shall be thoroughly bonded to it.

8 Any part of the completed paving not meeting the requirements of the drawings and the specifications shall be removed and replaced prior to acceptance and at the contractor's expense.

2. Cleaning

1 After completion of asphalt work and prior to final inspection, the contractor shall remove from all concrete walks, curbs, steps, walls and other structures, such contamination by asphaltic or other materials resulting from the work.

3. Testing

1 Laboratory test specimens of the paving mixtures shall be prepared and tested in accordance with the current procedures of the Ministry of Transportation.

2 When required by the consultant, all coarse and fine aggregates and mineral fillers to be used in the paving mixture shall be tested to determine conformance with the requirements of the specifications.

3 The contractor shall notify the consultant when aggregates and fillers are available for sampling and testing in order to determine the composition of the paving mixture(s).

4 Ample time shall be given to allow a period of not less than three (3) weeks for testing and designation of paving mixture prior to commencement of production.

5 The costs of such tests shall be charged as provided for in Section 01020 Allowances.

6 Asphalt cement shall be guaranteed by the supplier to meet the requirements of the specifications at the time of arrival on the site. When required by the consultant the asphalt cement shall be sampled and tested, free of charge, in accordance with the latest edition of ASTM-D140. Cost of sampling and testing shall be paid for by the supplier.

7 Liquid asphalts shall be guaranteed by the supplier to meet the requirements of the specifications at time of arrival on site.

8 Asphalt emulsions shall be guaranteed by the supplier to meet the requirements of the specifications at time of arrival on site.

9 When required by the consultant, asphalt emulsions shall be tested in accordance with the latest edition of ASTM-D244. Test samples shall be taken in accordance with ASTM-D140. The costs of samples and testing shall be the responsibility of the supplier.

4. Site Preparation

1 All rough grading, filling where required, excavating and preparation of sub-grade under all asphalt paving, shall be described under Section 02210 Earthworks.

2 The final sub-grade under asphalt paving shall have the approval of the consultant prior to placing of granular base course(s).

3 Any underground wiring or other utility trench occurring below a paved area shall be fully compacted to 100% Standard Proctor Density (S.P.M.D.D.). Do not place asphalt and later cut for installation of utilities. Fully inspect and duly accept wire crossings by the electrical contractor.

4 Upon approval of sub-grade, the contractor shall spread the approved specified granular base course materials in accordance with the drawings.

5 Granular materials shall be spread in layers not exceeding four inches (100 mm) in depth, per layer. The contractor shall take care that granular materials do not become contaminated by deleterious materials.

6 Immediately following spreading, each layer shall be compacted to 98% S.P.M.D.D. Areas adjacent to curbs, catch basins, manholes and other areas not accessible to rollers, shall be properly compacted with approved mechanical or hand tamping devices.

7 Depth indicated on drawings shall be the minimum depth after proper compaction.

8 All irregularities or depressions resulting from rolling shall be corrected and compacted until the surface is smooth and uniform and true to line and level.

9 Final grade of granular base shall be subject to the approval of the consultant before placing of asphalt.

10 The contractor shall arrange for compaction tests to be carried out by an independent testing firm and submit test results to the consultant prior to placement of asphalt. Have enough work prepared to justify four hours of work by the testing company.

11 The cost for such tests shall be paid for as provided for in the special conditions. Where re-testing is required, because of insufficient compaction, the cost of re-testing shall be the responsibility of the contractor.

5. Base Preparation

1 The approved granular base shall be proof rolled and inspected by the consultant. Excavate and re-work all soft areas.

2 Where the new asphalt surfacing is to be applied over existing asphalt, concrete or other hard surfacing, a tack coat shall be applied over the existing surfaces. The contractor is to assess and understand the timing of the works of the contract. Tack coat applications as may be required for the complete paving operations of the contract shall be at the cost of the contractor and are to be a component part of bids for this portion of the works.

3 Tack coat shall be an asphalt emulsion SS-1, or approved equal, applied at the rate of 0.5 litres per square metre.

4 The surfaces of all existing curbs, gutters, walls, vertical faces of existing pavements and all structures in actual contact with new asphalt mixes, shall be painted with a complete, thin coating of asphalt emulsion SS-1, or approved equal, to provide a closely bonded, water-tight joint.

6. Joints

1 All joints made during paving operations shall be straight, clean, vertical and free of broken or loose material. Where joints occur between new courses and existing previously laid down courses, the course shall be cut back sufficiently to provide a clean, vertical surface.

2 Vertical faces of all joints shall be painted with a thin, continuous coating of SS-1 to provide a tight, waterproof bond.

7. Placing of Asphalt Mixtures

1 All paving courses shall be spread within twelve (12) hours after the previous course has been spread and compacted.

2 Paving mixture shall not be placed when the temperature surface is less than or steady at 4 degrees Celsius. The base upon which the mixture is to be laid shall be dry and weather conditions suitable.

3 The temperature of the mixture shall not be less than 118° C immediately after

4 All courses shall be laid and spread by means of approved equipment. For walkways, form long smooth edges. Do not create straight-line chords on curved edges.

5 Immediately after spreading and screening, the surface shall be checked and all irregularities corrected before compaction is started.

6 Where hand spreading is necessary, this shall be done simultaneously with machine spreading or immediately afterwards to ensure a good bond.

8. Compaction

1 Each paving course shall be compacted with approved rolling equipment to produce a pavement with a density equal to or greater than 98% of the density of the laboratory compacted mixture.

2 Rolling shall be started as soon as possible after placing the mixture when it will bear the roller without checking or undue displacement.

3 Rolling shall be carried out in three (3) operations in close sequence. Each pass of the roller shall overlap previous passes to ensure a smooth surface free of roller marks.

1. The first "breakdown" rolling shall be carried out as close as possible to the paver, using either three-wheeled or two wheeled rollers, depending on the width of paving to be compacted.
2. The second rolling with pneumatic-tired rollers, shall follow the first rolling as soon as possible while the paving mix is still warm enough to result in the maximum specified density.
3. Final rolling shall be done with two-axle or three-axle tandems while the material is still warm enough for the removal of roller marks.

4 Hand tamping shall be carried out with hot tampers in all areas not accessible to the rolling equipment. Tamped edges of asphalt paving to be at a 45^0 angle.

9. Scheduling

1 Do not place final course of asphalt until all machinery and the like has permanently left the site. The owner shall receive a fresh surface, not damaged or driven on.

END

PAVEMENT MARKINGS

PART 1 - GENERAL

1. General

1 Division One, General Requirements, is a part of this Section and shall apply as if repeated here.

PART 2 - Materials

1 Paint: to CGSB 1-GP-74M + Amdt-May-81, alkyd traffic paint.

2 Colour: to CGSB 1-GP-12C + Amdt-Dec-84 - yellow 505-308, white 513-301. Other colours not including yellow and white as indicated on the drawings to match products above or approve equal. Additional colours red, blue and orange. Provide samples.

3 Thinner: to CGSB 1-GP-5M.

4 Block out paint to be 100% acrylic marking paint, colour black, supplied by SealMaster. www.sealmaster.net (800-395-7325) or approved equal.

PART 3 - Execution

1 Paint applicator to be an approved pressure type mobile distributor capable of applying paint in single and dashed lines and that will ensure uniform application and having a positive shut-off.

2 Pavement surface to be free from surface water, frost, ice, dust, oil, grease and other foreign materials.

3 Layout pavement markings. Obtain approval of Consultant.

4 Unless otherwise approved by Consultant apply paint only when air temperature is above 10 °C and no rain is forecast.

5 Do not thin paint.

6 Painting of symbols and letters and lines to conform to dimensions indicated. Disabled parking symbols and traffic arrows to conform to Provincial Standards and meet approval of municipal agencies.

7 Paint lines to be of uniform colour and density with sharp taped edges, for play and sports areas and as indicated on Drawings.

8 Paint markings to be within ± ¼” (6 mm) of dimensions specified.

9 Protect pavement markings until dry and inspected by Consultant.

1. Symbols

1 Accessible parking spaces shall be provided with a symbol in accordance with drawing details and CAN/CSA-B651-M90.

END

SealMaster®
Pavement Products & Equipment

Technical Data Sheet

LINE BLOCK-OUT
Traffic Paint

SMT-245

REVISED 06/26/20

PRODUCT DESCRIPTION & BENEFITS
Line Block-Out Paint is a 100% acrylic black paint designed to black-out unwanted traffic lines and markings.

USES
For blacking out unwanted lines on highways, roads, and parking lots.

COMPOSITION
Line Block-Out Paint is comprised of 100% acrylic emulsion resins, specialty pigments, surfactants, and fillers.

SIZES
Available in 55-gallon drums, and 5-gallon pails.

COLOR
Black.

LIMITATIONS
Line Block-Out Paint shall not be applied when temperature is expected to drop below 50°F at any time within a 24 hour period after application.

ENVIRONMENTAL CONSIDERATIONS
Line Block-Out Paint is an environmentally friendly 100% acrylic emulsion traffic paint containing less than 100 grams per liter volatile organic content (VOC).

PHYSICAL/CHEMICAL PROPERTIES:
Line Block-Out Paint meets or exceeds the following specifications when tested in accordance with ASTM D562, ASTM D711, ASTM D969, ASTM D1475, ASTM D3960, ASTM D2486, and ASTM E70. (see chart below)

Chemical & Physical Analysis	
Weight per Gallon	11.9 lbs./gal.
Volatile Organic Content (VOC)	<100 g/l
Viscosity (KU)	70-110 KU
Dry to no Pick-Up Time	<30 min.
Scrub Resistance	1,000 cycles min.
Degree of Bleeding	.98 min.
Water Resistance, cycles	8 min.
PH of Paint	9.6 min.
Solids by Weight %	57 - 59

INSTALLATION
Asphalt and concrete pavement surfaces shall be clean and free from all loose materials and dirt. New asphalt surfaces should cure sufficiently to be free of light oils on the surface (4 weeks). Allow freshly applied pavement sealer to cure for at least 24 hours prior to applying traffic paint.

METHODS
Apply Line Block-Out Paint with pressurized spray equipment, brush, or roller.

Recommendations for Airless Spray Line Striper:

Pressure - 2,000-2,500 PSI
Tip - .021 - .025
Filter - 60 mesh

MIXING PROCEDURES
Stir well and strain before using. Use as is. Do not dilute.

APPLICATION
Apply to properly cleaned pavement with pressurized spray equipment, brush, or roller.

ESTIMATING MATERIAL REQUIREMENTS
One gallon of SealMaster Traffic Paint will provide 325 feet of 4-inch line at 15 mils wet thickness.
NOTE: Coverage rates will vary due to pavement porosity and application thickness.

PRECAUTIONS
Both surface and ambient temperature shall be a minimum of 50°F. Temperature shall not drop below 50°F within a 24 hour period following application. Keep Out Of Reach Of Children. Do not store unopened containers in freezing temperatures.

PACKAGING AND AVAILABILITY
Line Block-Out Paint is supported by a nationwide network of SealMaster manufacturing facilities along with a national network of professional applicators.

WARRANTY AND DISCLAIMER
The statements made on this technical data sheet are believed to be true and accurate and are intended to provide a guide for approved application practices. As workmanship, weather, construction, condition of pavement, tools utilized, and other variables affecting results are all beyond our control, the manufacturer warrants only that the material conforms to product specifications and any liability to the buyer or user of this product is limited to the replacement value of the product only. The manufacturer expressly disclaims any implied warranties of merchantability or fitness for a particular purpose.

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TOPSOIL, PLACEMENT AND GRADING

PART 1 - GENERAL REQUIREMENTS

1. Summary

1 Section Includes

1. Labour, products, equipment and services necessary to complete the work of this Section.

2. References And Related Sections

1 Related Sections

1. Sodding	Section 32 92 23
2. Planting	Section 32 93 10

2 References

1. ASTM: American Society of Testing Materials
2. Canadian System of Soil Classification: Agriculture and Agri-Food Canada. 1998. The Canadian system of soil classification. Third edition. Soil classification working group. Agriculture and Agri-Food Canada Publication 1646.

3. Submittals

1 Submit to the Consultant a minimum of 20 Working Days prior to commencement of the Work, the following:

1. Sources of topsoil and manufactured topsoil to be utilized.
2. Soil analysis testing results.

4. Testing

1 Testing is required for all imported topsoil. Arrange for and be responsible for costs related to soil testing.

2 Topsoil and planting mix test analysis report shall provide:

1. pH
2. Percent organic matter by dry weight
3. Chemical levels in ppm of, at minimum:
4. Nitrate
5. Ammonium
6. Phosphorus (P)
7. Potassium (K)

8. Calcium (Ca)
9. Sulfur (S)
10. Magnesium (Mg)
11. Manganese (Mn)
12. Chlorine (Cl)
13. Copper (Cu)
14. Iron (Fe)
15. Nickel (Ni)
16. Zinc (Zn)
17. Boron (B)

3 Particle size analysis compared to USDA Soil Classification System per ASTM D422 (hydrometer test) or ASTMF1632 (pipette test), and tested by passing topsoil and planting mix through a ¼ inch sleeve to enable passage of larger organic matter materials

4 Soluble salt by electrical conductivity of a 1:2 soil water sample measured in Milliohms per centimetre

5 Cation Exchange Capacity (CEC)

6 Recommendations to improve fertility and ability to promote growth of specified planting material, if required.

7 Physical analysis of planting mix shall provide bulk density and water permeability with the sample compacted to 80% and 85% maximum dry density (Proctor).

8 Sand manufacturer's particle size analysis, including Fineness Modulus Index (FM), of sand component shall be submitted.

9 Organic matter and high-lignin organic matter manufacturer's data shall be submitted. Minimum analysis shall include:

1. pH
2. Salinity
3. Total organic nitrogen
4. C:N ratio
5. Solvita® Compost Maturity Index
6. Moisture
7. Sodium (Na)
8. Phosphorus (P)
9. Potassium (K)
10. Calcium (Ca)

11. Magnesium (Mg)

12. Organic matter analysis reports from samples older than four months of the date of sample submission shall not be accepted.

10 Arrange for and be responsible for costs related to additional soil testing for confirmation of conformance to soil test report recommendations and as may otherwise be required by the Consultant.

5. Samples

1 Submit sample of topsoil.

2 Retain approved samples on site until all work has been inspected, approved and accepted.

3 All work shall conform to approved samples.

PART 2 - PRODUCTS

1. TOPSOIL

1 Use only imported topsoil when topsoil from site has been depleted.

2 Topsoil used to manufacture the planting soil mixture shall conform to the following:

1. Topsoil used in the planting mix shall be high-quality, naturally occurring fertile sandy loam, loam or sandy clay loam, as described by The Canadian System of Soil Classification.
2. Topsoil shall consist of between 7% and 20% clay, 3% and 7% organic matter (by weight) and 8% combined stone and gravel content.
3. Topsoil pH shall range between 6.0 and 7.8.
4. Topsoil salinity shall not exceed 3.0 mmhos/cm at 25°C.
5. Topsoil shall be entirely free of all contaminants and deleterious materials such as litter, construction materials, stones greater than 25mm in diameter, wood materials greater than 25 mm in diameter, plant or soil pests, subsoil, or any other contaminants that may damage or otherwise impair plants or plant growth.
6. Plant material including noxious weeds and their seeds, tubers, rhizomes, sod, crabgrass and couchgrass or roots shall not be acceptable in the planting soils.
7. A mix of sand, fertilizers, organic matter and/or other component parts assembled to meet the structural, chemical and other requirements of topsoil shall not be substituted for naturally-occurring topsoil that has developed through weathering, decomposition and other natural soil building processes.

8. Topsoil shall maintain a naturally occurring heterogeneous structure including loose soil, peds (clods or clumps) and void space.
9. Topsoil shall not be screened to avoid excessively homogenizing soil structure.
10. Topsoil source location shall be submitted to the Municipality or its Consultant for approval, along with an outline of all crops grown on topsoil and all herbicides and pesticides applied within the previous three years.
11. Topsoil shall be stockpiled in accordance with specifications for stripping and stockpiling of soils.

2. Organic matter (compost)

1 Organic matter (compost) used to manufacture or as a surface amendment for the planting soil mixture shall conform to the following:

2 Blended organic material, composted for a minimum of 6 months and frees of toxic and non-organic matter, in a stable, humus-like state and produced from aerobic decomposition.

3 Except as specified herein, compost shall conform to standards of Category ‘A’ compost as outlined in Canadian Council of Ministers of the Environment Guidelines for Compost Quality, PN1340 (2005) and Interim Guidelines for the Production and Use of Aerobic Compost in Ontario (2004).

4 Acceptable organic matter shall exhibit a dark brown color. Light brown organic matter shall be rejected.

5 Organic matter shall have a strong aerobic (sweet) odour. Organic matter with an anaerobic (sour) odour shall be rejected.

6 Organic matter shall not be over- or under-composted and shall have a Solvita® Compost Maturity Index of 7 or 8.

7 Organic matter pH shall range between 5.0 and 7.0.

8 Organic matter shall be stored in stockpiles not exceeding 1.8 metres. Stockpiles shall be turned once every two weeks. Stockpiles shall be covered with filter cloth material and protected from becoming saturated or overly dry. Stockpiles shall not be covered with plastic or similar materials.

9 Two duplicate 4 litre samples with manufacturer’s literature and material testing certification stating that organic matter meets requirements shall be provided to the Municipality or its Consultants a minimum of 45 business days prior to planned installation of planting mix.

3. High Lignin Organic Matter

1 High-lignin organic matter used to manufacture or as a surface amendment for the planting soil mixture shall conform to the following:

1. High-lignin organic matter shall consist of composted pine, spruce, fir or other conifer bark with a dark brown colour. Rice hulls, coconut husks or other plant materials with hard fibrous structures are also acceptable.
2. High-lignin organic matter shall have particle size of 1 mm - 15 mm.
3. pH shall range between 4.5 and 6.5.
4. Wood fibre content shall not exceed 10%. Remainder shall consist of bark or other specified materials.

2 Two duplicate 4 litre samples with manufacturer's literature and material testing certification stating that high-lignin organic matter meets requirements shall be provided to the Municipality or its Consultants a minimum of 45 business days prior to planned installation of planting mix.

4. Coarse Sand

1 Coarse sand used to manufacture the planting soil mixture shall conform to the following:

1. Sand used in the planting mix shall be clean, sharp, coarse grade silica sand with a Fineness Modulus Index (FM) of 2.8 to 3.2.
2. Limestone, shale, and slate particles in sand mixture will result in rejection of materials.
3. Sand shall consist of less than 0.5% organic matter (by dry weight).
4. pH of sand shall be less than 7.0.

2 Two duplicate 4 litre sample with manufacturer's literature and material testing certification stating that sand meets requirements shall be provided to the Municipality or its Consultants a minimum of 45 business days prior to planned installation of planting mix.

5. Fertilizer

1 Chemical amendments to modify soil fertility shall only be utilized based on supporting soil test results and recommendations. Chemical amendments shall not be added as a matter of routine without supporting soil fertility test recommendations.

2 Adjust fertilizer requirements and rates as well as addition of other additives, to conform to soil testing recommendation, at no extra cost to the Contract.

3 Hydrated lime shall not be used to stabilize planting soils or promote soil aggregation in areas where trees will be planted. Soils treated this way shall

not be used for planting trees. If planting soils are treated with hydrated lime they shall be removed and replaced with suitable unlimed soils.

4 Due to the difficulty of permanently altering soil pH levels, chemical additives to alter pH shall only be used if approved by the Municipality or its Consultants.

6. Preparation Of Planting Soil Mixture

1 Planting soil mixture shall be prepared using the following proportions of the planting soil materials.

1. Organic matter (compost) – Tilled in after planting soil mixture installation
2. High-lignin organic matter – 10% +/-2%
3. Coarse sand – 45% +/-10%
4. Topsoil (imported) 45% +/- 10%

2 The component mixture of sand and topsoil shall be adjusted such that the planting mix drains at a rate of 50-75 mm per hour when installed and compacted to 80% of maximum dry density (Proctor).

3 Planting mix pH and nutrient levels shall be adjusted in accordance with the results and recommendations of the soil test. pH of planting soil mixture shall range between 6.0 and 7.5.

4 Two 4-litre samples of planting mix #2 and written laboratory test results shall be provided to the Municipality or it's Consultants no more than 20 business days after acceptance of component materials.

7. Planting Soil Manufacture

1 Planting soil shall be manufactured and stored in accordance with the following:

2 Planting mix components shall not be blended until all individual components are approved by the Municipality.

3 Planting mix shall be mixed with a front end loader bucket. Soil blending machines shall not be used and assembled soil mixes shall not be screened.

4 Sand and required organic materials shall be mixed prior to addition of topsoil. Mixture of sand and organic matter shall be spread on 300 mm of topsoil and the two materials shall be loosely mixed together. Care shall be taken to avoid over mixing and disturbing soil peds and homogenizing soil structure.

5 While soil peds are a critical component of good soil structure, an excessive amount of peds and massive soil clumps shall not be permitted. The maximum ped inclusion in soil mixes shall be:

6 Unlimited for peds less than 25 mm diameter.

7 15% of total soil mix for peds 25-75 mm diameter.

8 5% for peds 75 mm – 150 mm in diameter, and.

9 Less than 2% for peds greater than 150 mm in diameter.

10 Final planting mix shall not be stockpiled higher than 1.8 metres. Planting mix stockpiles shall be loosely covered with filter cloth material and protected from becoming saturated. Stockpiles shall not be covered with plastic or similar materials.

PART 3 - EXECUTION

1. SITE PREPARATION

1 Subgrade shall be graded as per grading plan to ensure proper drainage.

2 Grade the soil, eliminate uneven areas and low spots, and ensure positive drainage.

3 Remove debris, roots, branches and stones in excess of 25 mm in diameter and other deleterious materials. Remove debris which protrudes more than 75 mm above the surface. Dispose of removed material off Site.

2. PLACEMENT AND SPREADING OF TOPSOIL

1 Place topsoil after the Consultant has accepted the condition of the subgrade.

2 Add commercial fertilizers in accordance with soil testing report.

3 Mix topsoil, compost and other additives thoroughly on the site, not more than two (2) days before placement of topsoil.

4 Do not place topsoil in a muddy or frozen condition.

5 Spread topsoil in uniform layers not exceeding 150 mm.

6 Spread topsoil to the following minimum depths after settlement: 150 mm for seeded areas; 150 mm for sodded areas; and as per details for trees and shrub beds.

7 Tracked or large-tired equipment shall be used to install soils, and repeated passes over areas of soil installation shall be avoided to the greatest extent possible. Where possible, cranes or conveyors shall be used to deliver soil from stockpiles to the installation area. Soil blowers and soil pumps shall not be used to install the planting soil mixture.

8 Planting mix shall be installed in lifts as specified below:

9 Finished subgrade soil shall be tilled by roto-tiller or equivalent equipment to a depth of 25-50 mm prior to installation of first lift of planting mix. Tilling will improve the transition between soil types, facilitate movement of water and nutrients, and improve root penetration into lower soil profiles.

10 First lift of planting mix shall be to a depth of 25-50 mm. First lift shall be tilled into subgrade soil by roto-tiller or equivalent equipment to provide a gradual transition between planting mix and subgrade soil.

11 Remaining planting mix shall be installed in multiple lifts of 150 mm to 300 mm.

12 Lifts and compaction shall be repeated until desired soil depth is reached.

13 The planting soil mixture shall be compacted to between 75% and 80% of maximum dry density (Proctor). Planting mix directly beneath and beside root balls of all trees planted shall be compacted to between 85% and 90% of maximum dry density (Proctor) to reduce tree settlement.

3. Addition Of Chemical Additives

1 Chemical additives shall be added following installation of planting mix only if recommended by a soil test, and shall be specific to the plant types to be installed.

2 The type, application rate and method of application shall be approved by the Municipality or its Consultants prior to application.

3 Soil shall be re-sampled following application of chemical additives, planting mix shall be re-sampled and tested to determine if additional chemical applications are required or if desired goals have been achieved.

4. Addition of organic matter

1 In planting areas to be sodded, till in an additional 40 mm of high-lignin content organic matter into top layer of installed planting mix to a depth of 60-90 mm.

2 In planting areas which will not be sodded, till in 80 mm of organic matter such as leaf compost into top layer of planting mix to a depth of 60-90 mm.

5. Finish Grading

1 Grade to eliminate rough spots and low areas and to ensure positive drainage.

2 Finish surface shall be fine graded to meet specified grades after 12-month planting mix settling period. As such, finished grades shall remain 50-75 mm higher than specified grades on grading plans to allow for settlement in first year.

3 Grades having settled beyond specified elevations by an amount greater than 5% of the soil depth shall be repaired after 12-month settling period to conform with grading plan specifications. Where settlement is greater than 75 mm, all mulch and plants shall be removed, specified planting mix shall be added, and plants and mulch shall be replaced.

4 All finished grades shall be smooth, uniform and firm against deep footprinting.

6. Clean-Up

1 All surplus materials to be disposed of off Site.

2 During planting mix installation, surrounding surfaces shall be kept in a generally clean condition. The work site shall be kept free of litter and refuse to prevent introduction of contaminants into planting mix. Litter shall not be buried on-site.

7. Protection After Completion

1 Assume full responsibility for protection of all topsoil areas until all project work has been completed, approved and accepted.

8. Acceptance

1 Provide timely notice, in writing, to the Consultant for inspection of topsoil in place to determine acceptance of the material, depth of topsoil and finish grading prior to seeding, sodding, and planting.

END

SODDING

PART 1 - GENERAL REQUIREMENTS

1. Description

1 This specification covers the furnishing of all labour, materials, equipment and services required to provide the necessary fine grading and placement of sod for general purpose areas.

2 Comply with requirements and conditions of the Municipality Invitation to Tender, Division1; the General Conditions of Contract; Supplementary Conditions and any requirements of Special Provisions applicable to this section of the work.

2. Scope of Work

1 The major work required to complete is as follows:

2 Shaping of the final grade and protection of sub-drains within the workzone.

1. Ensuring that the grades of swales are protected and that overland drainage will occur as intended by the plans.
2. The delivery and placement of nursery grown sod as specified herein. The protection of graded areas to ensure maintenance of the created crowns of the sports-fields.
3. Removal and legal disposal of any excess cut materials or waste from the site.
4. Protection of trees, structures and the work of others during the work described herein.
5. Cleaning and reinstatement of work area as required by the contract administrator.
6. In addition, it is required that incidental and minor items indicated, specified or implied by the nature of this type of work be completed within the scope of this specification.

3. Related Work

1	Earthworks	Section 31 14 11
2	Topsoil Placement and Grading	Section 32 91 21
3	Planting	Section 32 93 10

PART 2 - PRODUCTS

1. Topsoil

1 Topsoil for fine grading shall be free from subsoil, roots, vegetation, debris, toxic materials, stones over 25 mm diameter. Topsoil shall be a natural loam with an acidity range from 6.0 pH to 7.5 pH; containing organic matter of 4% for clay loams and a minimum of 2% for sandy loams; and free of stones and roots over 50 mm dia., and subsoil, clay lumps, other solid materials, noxious weeds, weed seeds or other deleterious materials.

2 All topsoil shall be tested for agricultural fertility and chemical composition including N.P.K. and minor elements as well as for clay and organic matter content, and acidity (pH) range, when required by landscape architect. After being tested, written test reports shall be submitted and approved by the landscape architect, before topsoil is imported and used on site.

3 All topsoil materials both on-site and imported is to be tested by the contractor and the costs of such tests incorporated within the base bid tendered by the contractor for the works of this contract.

2. Sod

1 Sod shall be a Certified No. 1 sod, grown and sold in accordance with the latest specifications of the Nursery Sod Growers Association of Ontario (NSGA).

2 At the time of installation, sod shall have a strong, fibrous root system, be free of disease, stones, burned or bare spots, with a healthy green colour and contain not more than 1% twitch grass and other weeds.

3 Sod shall be cut and rolled in sections of .836 sq. m. in area and approximately 32 mm thick as specified by the NSGA.

4 Wooden pegs, for staking of sod on slopes 1:3 and steeper, shall be approved hardwood pegs 25 mm x 25 mm square and at least 225 mm long, or longer, as required to provide satisfactory anchorage.

5 Fertilizer shall be a commercial fertilizer having a 10-10-10 ratio and shall be applied such that actual nitrogen shall be 10.5 kg. 100 sq. m.

3. Delivery and Storage

1 Protect sod during transportation for delivery to the site in a fresh and healthy condition.

2 Install sod immediately - no later than 48 hours after arrival on site. Keep moist and fresh until installation.

3 Handle sod carefully to prevent breaking or tearing. Immediately remove damaged or dried-out sod from the site.

PART 3 - EXECUTION

1. Site Preparation

1 Adjust and grade sub-grade (potentially by others) to allow the placing of topsoil to minimum depths below finished grade as specified.

2 Scarify sub-grade to at least 75 mm deep and remove debris and all stones 50 mm in diameter and larger.

3 Prior to placement of topsoil arrange for inspection of finished grade by the consultant.

4 Spread and grade topsoil evenly over approved sub-grade to depths indicated on plans and specifications.

5 Unless recommended otherwise on soil test report, apply a 10-10-10 fertilizer at the rate of 10.5 kg/100 sq. m.

6 Work fertilizer well and uniformly into the topsoil within 48 hours before laying sod.

7 Fine-grade, rake and roll surface until smooth and firm against footprints, and free of depressions, lumps and irregularities.

2. Installation

1 Place sod closely knit together so that no open joints are visible and pieces are not overlapping.

2 Install sod to blend tight and uniformly with adjoining grass areas and to be flush with paving, top of curbs, etc, or 25mm lower than asphalt paving on downside of paved surface.

3 Particular care is to be taken in the grading and sodding to ensure that there are no sharp changes in grade, raised edges or ridges that will affect the performance of the surface.

4 On slopes of 4:1 and steeper, place sod perpendicular to the slope and stake every row with wooden pegs at 600 mm intervals. Drive pegs flush with sod.

5 Immediately after installation, water with sufficient amount to saturate sod and underlying topsoil.

6 As soon as sod has dried sufficiently to prevent damage, roll with roller to ensure a good bond between sod and topsoil and to remove minor depressions and irregularities.

7 Clean up all areas and remove debris.

3. Maintenance

1 Maintain all sodded areas immediately after installation until all project work has been inspected, approved, and accepted by the Municipality.

2 Maintenance shall include all necessary measures to establish and maintain grass in a healthy, vigorous growing condition. Provide a minimum of two cuts as a maintenance requirement regardless of date of acceptance.

3 Maintenance shall include, but not be limited to, the following work:

1. Mow grass areas at regular intervals as required maintaining grass at a maximum height of 50 mm. Not more than 1/3 of grass blade shall be cut during one mowing. Hand clip where necessary and keep edges neatly trimmed. Remove heavy clippings immediately after mowing and trimming. Do not let grass exceed 100 mm height.
2. Weed and disease control when necessary. Use chemicals in strict accordance with manufacturer's recommendations and be fully responsible for all damages resulting from use of chemicals.
3. Fertilize and water, when necessary, with sufficient quantities of water to prevent sod and underlying soil from drying out. Water is considered contractor's cost.
4. Roll all sodded areas to remove minor depressions and irregularities.
5. Repair all erosion damage resulting from faulty workmanship.
6. Replace all grass which has deteriorated, or which shows bare spots.
7. Protect all grass areas against damage, including erosion and trespassing, by providing and maintaining proper safeguards. Remove safeguards at end of maintenance period.

END

SUB DRAIN

PART 1 - GENERAL REQUIREMENTS

1. Description

1 This specification covers the furnishing of all labour, materials, equipment and services required to install sub-drains at paved areas and at the play structure specified for the park. Install sub-drains at the locations and details indicated by the plans; and as specified hereinafter.

2 Comply with requirements and conditions of the Municipalities Request for Tender, Division1; the General Conditions of Contract; Supplementary Conditions and any requirements of Special Provisions applicable to this section of the work.

2. Scope of Work

1 The major work required to complete is as follows:

1. Excavations as required to establish drainage trenches at the necessary inverts to successfully drain the areas described by the plans.
2. The placement of bedding materials and installation, joining and connections of sub-drain piping.
3. Removal and legal disposal of any excess and waste materials from the site.
4. Protection of trees, structures and the work of others during the work described herein.
5. Cleaning and reinstatement of work area as required by the contract administrator.
6. In addition, it is required that incidental and minor items indicated, specified or implied by the nature of this type of work be completed within the scope of this specification.

3. Related Work

1	Earthworks	Section 31 14 11
2	Soil Management	Section 31 10 00

PART 2 - PRODUCTS

1. Pipe

1 Pipe to be Big 'O' perforated and / or non-perforated polyvinyl chloride, CSA approved.

2 Solid drainage pipe shall be SDR 35 to dimensions as detailed on plans.

2. Fittings

1 All fittings (T's, elbows, couplers etc.) shall be manufactured and of the same material and manufacturer as the pipe, and shall be used at all junctions, bends, and terminations of the pipe.

3. Filter

1 Filter sock, where required, to be continuous knitted polyester.

4. Backfill

1 Backfill material to be 19 mm clear crushed limestone for general trench drainage.

2 Backfill material to be as detailed in Section 31 14 11 Earthworks.

5. Miscellaneous

1 All couplings, tee, end caps, reducers, elbows, etc. to be manufactured PVC, and securely fastened.

PART 3 - EXECUTION

1. Inspection

1 Obtain the consultants approval prior to backfilling trenches.

2. Excavation

1 All areas for drainage shall be excavated to the specified depths as shown on drawings and details.

2 Excavate trenches in straight lines and, if deviations from the plans occur, make as-built drawings.

3 De-water trenches if required during rain periods.

3. Backfilling

1 Backfill with materials as indicated on the drawings, to 90% Standard Proctor Maximum Dry Density (S.P.M.D.D.) around the pipe.

2 Backfill in 300 mm lifts and consolidate each layer of fill.

3 Fill materials above the drainage pipe shall be mechanically compacted, up to the finished grade, to 98% S.P.M.D.D. Be responsible for making good any subsequent settlement of fill and/or work placed on top of it.

4. Installation

1 Place perforated pipe with holes facing downward.

2 At all ends, install insert end caps.

3 Ensure a minimum continuous fall of 1.0%, (or other grades, as may be listed on the drawings), is achieved.

4 Fully grout and patch at point of connections to any catch basin and/or manhole.

END