ST. HEDWIG CATHOLIC SCHOOL
KINDERGARTEN PLAYGROUND RENOVATION

421 Olive Ave, Oshawa, ON L1H 2R2

ARCHITECTURAL SPECIFICATIONS
PROJECT MANUAL VOLUME 1

Moffet & Duncan Architects Inc.
Prime Consultant

VOLUME 1 **ARCHITECTURAL SPECIFICATIONS**

Architectural
Moffet & Duncan Architects Inc.

The seals above pertain to the specification sections bearing the name of the relevant consultant at the bottom of each page in Project Manual Volume I.

1.1 CONTRACT DOCUMENTS

.1 Contract documents for work under this contract consists of the following:

.1 Standard Construction Document CCDC 2, 2020, including signed Agreement
.2 Supplementary Conditions to CCDC2-2020, included in the Request for Tender document
.3 Specifications as listed in Index to Specifications
.4 Drawings as listed in List of Drawings
.5 All Detail Drawings and Schedules as bound in Project Manual
.6 All Addenda issued prior to closing of the tender
.7 Amendments incorporated prior to the signing of the Contract, as agreed to between the signing parties.

1.2 PRODUCTS SUPPLIED BY OWNER

.1 Products, including appliances, indicated on the drawings as "N.I.C.", or so noted in specifications, are not included in the Contract but will be supplied by the Owner. These are to be put in place and connected to services by the Contractor.

.2 The Owner will provide manufacturer's installation instructions for each such product, when available.

.3 The Contractor's duties with respect to products supplied by the Owner include:
.1 Unload and handle at site.
.2 Remove and dispose of packaging. Inspect delivered products notify Owner and Consultant of any damage or missing components.
.3 Temporarily store products in secure and suitable storage, if they are not to be installed immediately.
.4 Install products complete with all mounting brackets and supporting hardware included, as applicable.
.5 Connect to services as applicable.
.6 Coordinate with millwork subcontractor to provide trim at items installed in cabinetry.

1.3 RELATION OF TRADES

.1 These specifications have been divided into sections generally conforming to Construction Specifications Canada Master Format 2016 for the purpose of ready reference. They must be read as a whole. The responsibility for apportioning the work or of settling disputes related to same shall rest entirely with the Contractor.

.2 The Contractor is responsible for co-ordinating all trades. He is solely responsible for determining the lines of demarcation between Contractor and/or trades. Neither the Consultant nor the Owner assume any responsibility for any such determination or for any dispute arising concerning it. No extras will be considered due to any such dispute concerning either labour or materials.

.3 Specifications and drawings form an integral part of the Contract Documents. Any subject or item omitted from one but which is mentioned or reasonably implied in the other, shall be considered properly and sufficiently specified and will be part to the work.

1.4 **EXAMINATION OF SITE**

.1 Examine existing building and site immediately prior to commencing Work to confirm that building and site as received by the Contractor, including adjoining Municipal lands, conform to information on tender documents.

.2 Notify Consultant immediately if site conditions are not acceptable. Commencement of the Work of this Contract will be taken as acceptance of site conditions. No extras will be considered unless accepted in advance of performance of the work, in writing, by Owner and Consultant.

.3 Contractor must make himself familiar with conditions on the roadway which may affect construction ie location of services, road widening, site access, etc.

.4 Note that the existing school will be occupied during the school year. The Contractor maintain safe access to the existing building for all building occupants and visitors at all times.

1.5 **ACCEPTANCE OF WORK IN PLACE**

.1 Before starting his work and from time to time as the work progresses, each subcontractor shall examine the work and materials installed by the other subcontractors insofar as it affects his own work, and shall promptly notify the Consultant IN WRITING, if any condition exists that will prevent him from giving a satisfactory result in his own work.

.2 Should the subcontractor start his own work without such notification, it shall be construed as an acceptance by him of all preceding work and as a waiver of all claims or questions as to its suitability for receiving his work.

1.6 **MATERIALS AND WORKMANSHIP**

.1 All materials shall be new and the best of their respective kinds. Where a specific grade or brand is not indicated preference shall be given to materials of Canadian manufacture. Pre-packaged materials shall be delivered and stored in unopened containers.

.2 All work performed under this Contract shall be done by mechanics skilled in their respective trades. They shall make use of such templates, jigs or special tools as may be required for the operation involved.

.3 The Contractor is responsible for maintaining quality of workmanship. He shall report to the Consultant whenever the Work or material of any trade does not meet the required standard.

.4 The acceptance of any materials or workmanship shall not be a bar to their subsequent rejection, if found defective.

.5 Rejected materials and workmanship, and any work which is found defective, shall be removed and replaced or made good by the Contractor without cost to the Owner and to the satisfaction of the Consultant.

.6 Adequate, dry storage facilities shall be provided and all stored materials shall be protected from damage and theft.

.7 Perform Work in accordance with the best industry practice of the type of work specified, unless the Contract Documents stipulate more precise requirements, in which case, the more precise requirements shall govern.

.8 Do Work in a neat, plumb & square manner. Ensure that various work components are properly installed, forming tight joints and appropriately aligned junctions, edges and surfaces, free of warps, twists, waves, or other such irregularities.

.9 Wherever indicated on the drawings or specifications, or in the manufacturers'/suppliers' written instructions, arrange to have manufacturers'/installer's representatives inspect the Work which incorporates their materials, products or items.

.10 Do not permit materials to come in contact with other materials such conditions may result in corrosion, staining, discolouration or deterioration of the completed Work. Provide compatible, durable separators where such contact is unavoidable.

.11 Where equipment supported by the walls or structure, shop drawings must be stamped by an Ontario Registered Professional Engineer confirming that the wall/structure is capable of supporting the equipment/element and that the anchorage provided is adequate to support the equipment/element together with any potential load or stress.

.12 The design of the Work is based on the full interaction of its component parts. No provisions have been made for conditions occurring during construction. Ensure that no part of the Work is subjected to a load which will endanger its safety or which might cause permanent deformation.

.13 Conceal pipes, ducts, conduit, wiring and other such items requiring concealment preferably in, wall or ceiling construction of all finished areas. If in doubt as to method of concealment, or intent of the Contract Documents in this regard, request clarification from the Consultant before proceeding with the Work.

.14 Lay out electrical work well in advance of concrete placement and furring installation to allow for proper concealment. Test and inspect Work before applying pipe covering and before it is concealed.

.15 Provide and maintain control lines and levels required for the Work. Lay out the Work in accordance with these lines and levels and dimensions indicated on the drawings.

.16 Verify lines, levels and dimensions and report any errors or inconsistencies on the drawings to the Consultants.

.17 Final responsibility of satisfactory completion of all the Work, however, lies with the Contractor.

1.7 **SECURITY**

.1 The Contractor shall be responsible for security of all areas affected by the Work of this Contract until taken over by the Owner. Steps shall be taken to prevent entry to the Work by unauthorized persons and to guard against theft, fire and damage by any cause.

.2 A regular full-time watchman will be required on site once the connection is opened to the existing school or from Substantial Performance of the Work , whichever occurs first, until Occupancy by the Owner. During this time the Contractor must have a watchman on site whenever construction personnel are not on site, ie nights, weekends, holidays, stoppages, etc. In addition if, in the opinion of the Consultant, the Work is not adequately protected by the Contractor at any time prior to this, the Owner may demand that a watchman be employed by the Contractor at no extra cost to the Contract. The cost of site security at any time during the contract shall be fully borne by the Contractor.

1.8 **SCAFFOLDING**

.1 All necessary scaffolding shall be provided and constructed according to by-law and safety regulations.

.2 Construct and maintain scaffolding in rigid, secure and safe manner.

.3 Erect scaffolding independent of building walls.

.4 Avoid interference with other trades.

.5 Move when not in use to permit installation of other work and promptly remove when no longer required.

.6 The provision of scaffolding shall be a matter of agreement between the Contractor and Subcontractors.

.7 Build temporary stairs with handrail for access to upper floors until permanent stairs are in place.

1.9 **PROTECTION OF OTHER WORK**

.1 Each trade shall avoid damage to other trades and shall take all measures necessary and provide all masking and materials necessary to provide adequate protection.

.2 Each Contractor and Subcontractor shall be held responsible for all damage to work installed by others that is caused by this work or by anyone employed by him.

.3 Patching and repairing of damaged work shall be done by the contractor who installed the work, as directed by the Consultant, but the cost of same shall be paid for by the contractor who is responsible for the damage.

1.10 **FASTENINGS**

.1 All fastenings must be permanent, of same metal or compatible with any metals with which they are in contact, of adequate size and spacing to ensure permanent anchorage against load or shear.

.2 Exposed fastenings must be evenly spaced, neatly laid out and must not mar surfaces of prefinished materials.

.3 No ram setting or similar techniques will be permitted without prior written approval of the Consultant.

.4 No wood plugs and no anchorages which cause spalling or cracking will be accepted.

.5 Generally use plain washers. Where vibration may occur, use lock type washers and where fasteners are stainless steel use resilient washers.

.6 All fasteners exposed on the exterior must be stainless steel.

1.11 **SUPPLY AND INSTALL**

.1 Unless specifically noted "supply only", any reference to supply intends the supply and installation of material or item so noted.

1.12 **OCCUPATION BEFORE COMPLETION**

.1 If the Contractor, for any reason, does not have the job completed by the completion date and the Owner, of necessity, is forced to occupy any part of the building before the whole of the work is completed, the Contractor will not be entitled to any indemnity for interference with his operation.

1.13 **GENERAL REQUIREMENTS**

.1 All Subcontractors shall examine carefully all drawings and specifications to inform themselves fully of all conditions and limitations pertaining to the work of the contract.

.2 All Subcontractors shall co-operate and co-ordinate their work for the proper completion of the work, including co-ordination of delivery dates and commencement of sub-trades work.

.3 The responsibility for all work, including temporary structures, shoring and erection shall at all times rest with the Contractor and his Subcontractors. The Consultant will review construction methods and shop drawings for general arrangements only. The method of obtaining the results contemplated by the Contract Documents shall be determined by the Contractor.

.4 The undertaking of periodic site review by the Consultant or Owner's representative shall not be construed as supervision of actual construction, nor make him responsible for providing a safe place for work, visit, use, access, travel, or occupancy of their employees or agents.

.5 The Contractor shall be fully responsible for co-ordinating and expediting the work of all Subcontractors and shall employ the necessary and qualified personnel to provide the required quality of labour and materials and to prevent delays in the progress of the project. Each trade shall be afforded all reasonable opportunities for the installation of its work and for the storage and handling of its materials.

1.14 **COORDINATION**

.1 Coordinate all work and preparation on which subsequent work depends to facilitate mutual progress, and to prevent any conflict.

.2 Review all drawings to identify interference issues prior to commencing construction. Request and review interference drawings from all mechanical and electrical trades. Review all shop drawings, samples, product data, mock-ups, and other required submittals for potential interference issues and co-ordinate with the trades to avoid these conflicts.

.3 Where interference issues arise during construction, correct work at no expense to the Owner where the interference could have reasonably been foreseen.

.4 Ensure that each trade makes known, for the information of the Contractor and other trades, the environmental and surface conditions required for the execution of its work; and that each trade makes known the sequence of others' work required for installation of its work.

.5 Ensure that each trade, before commencing work, knows requirements for subsequent work and that each trade is assisted in the execution of its preparatory work by trades whose work depends upon it.

.6 Mechanical and electrical trades in particular, shall ensure that items, such as electrical panels, outlets, diffusers, switches, etc., are located where they will not interfere with the installation or operation of other items.

.1 Check all drawings for the location of items to be installed later, such as millwork, chalkboards, and other wall or ceiling mounted items.

.2 Ensure items installed do not interfere with the operation of equipment or fittings, such as the swinging of doors, opening of operable partitions or curtains, travel of ceiling lifts, raising of basketball backstops, etc.

.7 Review all shop and layout drawings, templates, and other required submittals for coordination purposes.

.1 Ensure that all information necessary for the location and installation of materials, openings, inserts, anchors, accessories, fastenings, connections and access panels are provided by each trade whose work requires co-operative location and installation by other trades and that such information is communicated to the applicable installer.

.2 Ensure that shop drawings for aluminum and hollow metal work are coordinated with the openings for doors, frames and windows; site measurements must be indicated on the drawings.

.3 Review millwork shop drawings to ensure adequate clearance from walls, doors, windows, writing boards, mechanical and electrical equipment, etc.

.8 Deliver materials supplied by one trade to be installed by another well before the installation begins.

.9 Trades giving installation information in error, or too late to incorporate in the work, shall be responsible for any extra work caused thereby.

.10 Immediately remove any work which is unsatisfactory for subsequent work, as directed by the Consultant or by the appointed inspection firms.

.11 Inform Commissioning Agent of all equipment installations and start ups.

1.15 SPECIAL REQUIREMENTS FOR OCCUPIED BUILDINGS

.1 All work outside of the construction enclosure must be scheduled with the school principal when the school is occupied.

.2 Maintain all emergency exits at all times. Do not interfere with building access, particularly in the 30 minutes before school commences each day and 30 minutes before and after the school day ends. Confirm timing of school day start and end, and lunch times, with school principal.

.3 All work which will result in excessive noise, dust, odours, or other unpleasant or unhealthy situations, shall take place outside of school hours, on evenings, weekends, or school holidays. Asphalting on roof and asphalt paving, in particular, must be scheduled when building is unoccupied.

.4 Ensure continuity of all utilities, including power and water. Schedule any required interruptions outside of school hours, in coordination with the school principal.

.5 Suppress dust, avoid conditions likely to disperse mould or fungus of any kind, and take steps reasonably necessary to maintain the safety and comfort of the building occupants.

.6 Cease any activity if advised by the school principal, or vice-principal that it is disruptive or offensive to building occupants.

.7 Workers are not permitted to use washrooms, building entrances, or parking areas other than those designated by the School Principal.

.8 Refer to Section 01 35 20 for additional site safety requirements which apply when the building is occupied.

.9 These requirements apply to all Work at both at existing school and at the new addition, once it is occupied.

1.16 **ACCESS TO THE PROJECT**

.1 The Contractor for this work shall at all times allow the Owner or any other contractor or their employees in the building or around the premises, undisturbed, whether union or non-union, as may be required in the execution of other portions of the building work and installation of equipment, etc.

.2 Cooperate fully with forces carrying out any work on behalf of the Owner.

1.17 **SUB-TRADE AWARDS**

.1 The Contractor shall, on notice of award of the contract, obtain the Consultant's approval of a complete list of all persons or firms to which he proposes to sublet any part of the work, the trades or divisions of work which are to be sublet to each, and the amount of each trade. He shall provide to the Consultant a financial breakdown showing all divisions of the work amounting to the full sum of the contract. Mechanical and Electrical trades shall be further broken down as required by the mechanical and electrical consultants.

1.18 **SAFETY DATA SHEETS**

.1 The Contractor shall submit material and safety data sheets prior to commencing installation and application of at least the following:

.1 lead-free solder
.2 sealants and caulking
.3 painting and finishing
.4 fertilizers
.5 pesticides

.6 herbicides
.7 all adhesives
.8 any other product which may give off air borne particles after installation

.2 The Contractor and all of his Subcontractors must note that specifically, Asbestos and Asbestos containing materials, solder for piping containing lead, and painting and coatings containing lead and/or mercury must be excluded from any part of the Work.

.3 The Contractor must submit Certificates of Compliance, prior to the application for Substantial performance, for each of the following items:

.1 An affidavit relative to the use of Lead-free solder for all domestic water lines, regardless of location.

.2 Products for which Material Safety Data Sheets have been submitted and accepted.

.3 Other Work/Products identified in the Contract Documents as requiring a Certificate of Compliance.

.4 Each Certificate of Compliance must indicate names and addresses of the project, the Owner, the date of Issue, produce description including name, number, manufacturer, with a statement verifying that the Work/Product installed meets specified requirements and, if applicable, complies with the submitted and accepted Material Safety Data Sheets.

.5 Each Certificate of Compliance must be issued on the trade's letterhead, properly executed, under whose work the respective Work/Product has been provided.

.6 Each Certificate of Compliance must be endorsed by the Contractor with his authorized stamp/signature.

.7 The Contractor must ensure that submissions are made to allow sufficient time for review without delaying progress of scheduled completion.

.8 WHMIS Material Safety Data Sheets (MSDS) are required to be provided before or with the first delivery of every controlled product.

.9 Ensure that worksite copies of MSDS's are available to workers wishing to consult them and to the health and safety representative and/or joint health and safety committee.

.10 Ensure that workers are instructed in the purpose and content of MSDS.

.11 Provide prescribed information on any workplace controlled product, including confidential business information, to a doctor or nurse who needs it for diagnosis or emergency medical treatment.

.12 WHMIS MSDS sheets to be kept on site at all times.

1.19 **REGULATING DOCUMENTS**

.1 Refer to Section 01 41 00, Regulatory Requirements. Conform to applicable Codes and Building By-Laws. Conform to the requirements of the authorities having jurisdiction, such as public utilities. Where required under The Occupational Health and Safety Act, engage a Professional Engineer to design formwork and falsework for concrete.

.2 Provide copies of documents referred to in the Specification for joint use of Contractor and Consultant, on site.

1.20 **CONTRACTOR'S RESPONSIBILTY**

.1 The Contractor will be responsible to take all necessary steps to protect personnel (workers, visitors, general public, etc.) and property from any harm during the course of the contract. The list of Contractor's responsibilities identified below is by no means comprehensive, nor is it in any priority or critical order. It is here, merely to identify the most often forgotten or ignored responsibilities of the Contractor and is reproduced only as a reminder. The Consultants and the Owner advise the Contractor that it is he who is responsible for all aspects and facets of the Project, from start to completion, from compliance with Occupational Health and Safety regulations to compliance with all codes and statutes.

.2 The Owner may perform periodic monitoring to ensure that safety requirements are met, and that safety records are properly kept and maintained. Continued disregard for safety standards can cause the Contract to be cancelled and the Contractor removed from the site.

.3 All work procedures and equipment shall be in accordance with Owner and Legislation standards.

.4 All equipment shall be in safe operating condition and appropriate to the task.

.5 Only competent personnel will be permitted on site. During the site introduction, the Owner will determine who is competent. The Contractor will cause to remove from the site any persons not observing or complying with safety requirements.

.6 The Contractor shall comply with all Federal, Provincial and Municipal Safety Codes and Regulations and the Occupational Health and Safety Act. He shall insure that all of his Subcontractors, suppliers, installers, etc. comply with all applicable codes, regulations, and acts.

.7 The Contractor shall supply competent personnel to implement his safety program and ensure that the Owner's standards, and those of the Occupational Health and Safety Act, are being complied with.

.8 The Owner may hire Commissioning Agents to perform inspections of building systems at the closing stages of the work of this contract. The Contractor shall cooperate with and coordinate the work of the Owner's Commissioning Agent on site.

.9 The Contractor shall report to the Owner and jurisdictional authorities any accident or incident involving personnel and/or property of the Contractor, Owner, or Public, arising from the Contractor's or any of his Subcontractors, execution of the work.

.10 Provide the Owner with a copy of each site visit report by the Ministry of Labour, as soon as the report is issued.

.11 The Contractor shall include all provisions of this contract in any agreement with Subcontractors, and hold all subcontractors equally responsible for safe work performance.

.12 If the Contractor is responsible for a delay in the progress of the work due to an infraction of legislation or Owner Health and Safety requirements, the Contractor will, without additional cost to the Owner, work such overtime, and acquire and use for the execution of the work such additional labour and equipment as to be necessary, in the opinion of the Owner's Representative, to avoid delay in the final completion of the work or any operations thereof.

1.21 **MANUFACTURER'S INSTRUCTIONS**

.1 Unless otherwise specified, comply with manufacturer's latest printed instructions for materials and installation methods.

.2 Notify Consultant in writing of any conflict between these specifications and manufacturer's instructions. Consultant will clarify any such conflict when requested.

1.22 **AIR, VAPOUR, AND THERMAL SEAL**

.1 Ensure that exterior walls, windows, floor and roof surfaces provide an air-tight and vapour-tight membrane to prevent problems due to building vapour migration.

.2 In general, the air/vapour barrier must be achieved on the interior side of the thermal insulation.

.3 The air barrier/vapour retarder membrane, together with flashings and caulking shall provide a complete and continuous air barrier/vapour retardant envelope. All trades must co-ordinate their work with the work of other trades to ensure that the continuity and integrity of the envelope is maintained.

.4 The Owner may require infra red thermal scans of the completed building faces to establish air leakage and thermal deficiencies. Scans will be done by an independent testing agency and paid for out of the Cash Allowances. In the event that the continuity of the exterior envelope has not been maintained the affected areas shall be rectified at no cost to the Owner.

1.23 **SAFETY REQUIREMENTS**

.1 Comply with safety requirements outlined in Section 01 35 20.

1.24 **TRUCKING COSTS**

.1 The Contractor is responsible for all costs related to trucking required for the Contract. No extra costs will be considered for weight load or limits due to seasonal conditions or restrictions on load capacities imposed by any authorities or any similar limitations or factors.

1.25 **INDEPENDENT TESTS AND INSPECTIONS**

.1 The Contractor shall appoint inspection firms as directed by Consultant and make payments from the cash allowances specified in Division noted, except for the following, which shall be included in the contract.

.1 Inspection and testing required by laws, ordinances, rules, regulations or orders of public authorities.
.2 Inspection and testing performed exclusively for Contractor's convenience.
.3 Testing, adjustment and balancing of mechanical and electrical equipment and systems.
.4 Mill tests and certificates of compliance.
.5 Re-testing as described under the Quality Control subsection, below

.2 The Consultant will authorize payment of inspection services from specified cash allowances.

.3 Where tests or inspections reveal work not in accordance with Contract requirements, Contractor shall pay costs for additional tests or inspections as Consultant may require to verify acceptability of corrected work. In the case of soil compactions, the first retest only will be considered as part of inspection allowance.

.4 The Contractor shall furnish labour and facilities to:

.1 Provide access to work to be inspected and tested.
.2 Facilitate inspections and tests.
.3 Make good work disturbed by inspection and test.
.4 Pour concrete test cylinders and store as directed by Inspection Firm.

.5 Notify Inspection Firms sufficiently in advance of operations to allow for assignment of laboratory personnel and scheduling of test.

.6 Where materials are specified to be tested, delivery representative samples in required quantity to testing laboratory.
.7 Pay costs for uncovering and making good work that is covered before required inspection or testing is completed and approved by Consultant.

1.26 **CASH ALLOWANCE**

.1 Include in the Contract Price, a stipulated sum Cash Allowance in the amount of $**2,000.00**, to be expended as outlined below, which shall apply to the following aspects of the Work:

Paving Inspection

.2 Additional cash allowances, to be carried by mechanical and electrical Subcontractors, are included in mechanical and electrical specifications.

.3 Cash Allowances, unless otherwise specified, cover the net cost to the Contractor of services, products, construction, machinery and equipment, freight, handling, unloading, storage installation and other authorized expenses incurred in performing the Work.

.4 The Contract Price, and not the Cash Allowance, includes the Contractor’s profit in connection with such cash allowance.

.5 The listing of a cash allowance in this section shall not be construed to imply the deletion from the base contract of any work which may be specified elsewhere. Fully specified work is included in the Contract unless otherwise noted. Where the expenditure of a cash allowance is not specifically outlined in the specifications, it shall be expended as per instructions and specifications to be provided by the Consultant at a later date.

.6 The Contract Price will be adjusted by written order by the Consultant to provide for an excess or deficit to the Cash Allowance. Any unused portion of the allowance shall be returned to the Owner at the conclusion of the Contract.

.7 A schedule shall be prepared by the Contractor to show when items called for under Cash Allowances are required, so that the progress of the Work is not delayed.

.8 Expend cash allowances as directed by Consultant in writing. Allowances will be adjusted to actual cost with no adjustment to Contractor's charges. Cash expenditure must identify the H.S.T. separately.

.9 Material Allowances

.1 Material allowances shall include the following:
- .1 Net cost of material
- .2 Applicable taxes and duties, excluding H.S.T.
- .3 Delivery to site

.2 For Material Allowance, the contract shall include:
- .1 Handling at site, including unloading, uncrating, storage and hoisting.
- .2 Protection from elements, from damage.
- .3 Labour, installation, and finishing.
- .4 Other expenses required to do cash allowance work (ie contract co-ordination).
- .5 Overhead and profit.

.10 Material and Installation Allowances:

.1 Material and Installation Allowances shall include the following:
- .1 Net cost of material
- .2 Applicable taxes and duties, excluding H.S.T.
- .3 Deliver to site
- .4 Handling at site, including unloading, uncrating, storage and hoisting
- .5 Labour, installation and finishing

.2 For Material and Installation Allowances, the contract shall include:
- .1 Protection from elements, from damage
- .2 Overhead and profit
- .3 Other expenses required to do cash allowance work (ie contract co-ordination)

.11 Testing and Inspection Allowances:

.1 Testing and Inspection Allowances shall include the following:
.1 Net cost of testing and inspection firm, and laboratory services, designated and authorized by Consultant.
.2 Applicable Taxes, excluding H.S.T.

.2 For Testing and Inspection Allowances, the contract shall include:
.1 Overhead and profit
.2 Supply of material tested
.3 Other testing and re-testing work specified
.4 Other expenses required to do cash allowance work (ie contract co-ordination)

1.27 **WARRANTIES**

.1 The following is a summary of the warranties required by the contract:

	# Years
Entire Building, General Contract	**1**
Pavement Markings	2
Asphalt Paving	2

.2 Additional warranties may be noted within the specification sections.

1.28 **ADDITIONAL DRAWINGS**

.1 Consultant may furnish additional drawings to assist proper execution of the Work. These drawings will be issued for clarification only. Such drawings, however, shall have the same meaning and intent as if they were included with plans referred to in the Contract Documents.

1.29 **QUALITY CONTROL**

.1 The Consultants and authorized Owner staff shall have access to all areas of the Work, including any off site construction facilities.

.2 The Contractor shall give timely notice requesting inspection if Work is designated for special tests, inspections, or approvals by the Consultants, or any other authorized Owner staff, or testing and inspection company.

.3 If the Contractor covers, or permits to be covered Work that has been designated as outlined above, he shall uncover such work, have the inspections and tests satisfactorily completed and make good such work at no additional cost to the Owner.

.4 The Consultants or the authorized Owner Staff may order any part of the Work to be examined, if such Work is suspected not to be according to the Contract Documents. If, upon examination, such work is found not to be in accordance with the Contract Documents, then the Contractor shall correct such Work and pay for cost of examinations and correction. If such Work is found to be in full accordance with the Contract Documents, the Owner shall pay for the cost of examination and making good.

.5 If defects are revealed during inspection and/or testing, the appointed agency may request additional inspection and/or testing to ascertain the full degree of defects. The Contractor shall correct the defects and irregularities as reported by the inspection and/or testing agency, at no additional cost to the Owner and the Contractor shall pay all associated costs for retesting and reinspection.

.6 The Contractor shall provide any tools, materials or equipment that may be required by the inspection and/or testing agencies in retesting the Work. (E.g. Video camera rental to reinspect incorrectly installed sewer lines.)

.7 The employment of inspection and/or testing agencies does not, in any way, affect the Contractor's responsibility to perform the Work in strict accordance with the Contract Documents.

.8 The Contractor shall remove all defective work, whether the result of poor workmanship by him or his subtrades, use of defective or damaged products, whether or not incorporated into the Work and any Work that has been rejected by the Consultants or authorized Owner Staff as failing to conform to the Contract Documents. Replacement and execution of the affected Work shall be done in full accordance with the Contract Documents, making good other trades' work damaged by such removals or replacements at no additional charge to the Owner.

.9 If, in the opinion of the Consultant and/or the authorized Owner Staff, it is not expeditious to correct the defective Work, or Work not performed in accordance with the Contract Documents, the Owner, may, at its sole discretion, deduct from the Contract Price, the difference in value between the work performed and that required by the Contract Documents, the amounts of which shall be determined by the Owner.

.10 The notable exception to the above item is a faulty installation of base and asphalt paving. If, the inspection agency, after performing random test holes to determine compaction and thickness of sub base, base and asphalt, determines that either one or both, are not according to what was specified in the Contract Documents, the Owner will not accept credits for such inconsistencies but rather, demand that any such installation be removed and redone in its entirety, at the convenience of the Owner, but within the first year of the warranty period.

1.30 **ENVIRONMENTAL DESIGN REQUIREMENTS**

.1 Indoor air quality is of major importance in the building. It is the intention of this Contract that the materials and products used be as low as possible in emissions of volatile organic compounds (VOCs). Low or no VOC products shall be used where these are available and suitable for the application. This is particularly of concern with regard to paints and other finishes, adhesives, sealants, and products manufactured using these materials.

.2 Any cleaners, solvents, fuels, aerosol sprays and other chemical products used during construction should also be low VOC emitting where possible. Provide good ventilation when using any products that may emit VOCs.

1.31 **START-UP**

.1 Administrative work may start immediately upon receipt of Letter of Intent from Owner, and Contractors submission of start-up documents and insurance.

.2 New work cannot commence without a building permit.

.3 Work in existing school must be undertaken when school is not in session.

1.32 **PAYMENT PROCEDURES**

.1 Refer to CCDC2 2020, Stipulated Price Contract, Part 5, Payment, and amendments included in the Supplementary Conditions.

.2 Before submitting first request for payment, submit a Schedule of Values, which shall be a detailed breakdown of the Contract price, as directed by the Consultant and as per the Owner's format. Breakdown must equal Contract price. After approval by Consultant, cost breakdown will be used as basis for progress payments.

.3 Notwithstanding the amounts indicated on the Schedule of Values for the various aspects of the Work, the Owner reserves the right to retain additional funds for some items, where listed in the specifications. This includes amounts to be retained for maintenance manuals and for commissioning, as outlined in the applicable specification sections.

.4 Applications for payment shall list HST separately.

.5 Submit applications for payment in draft form 5 working days prior to the end of the billing period, for review by the Consultant. Incorporate required revisions in submission of Proper Invoice.

.6 The Contractor shall submit their proper invoice for monthly payments to the Consultant on an Application For Payment form approved by Consultant. All Change Forms as approved during the proceeding months shall be entered on the Application Form and invoiced for portions of Work completed and shall be kept up to date month by month. All expenditures against the Cash Allowances shall be similarly claimed for the month that they were invoiced and must be supported by accompanying invoices at that time. No claims for expenses against the Cash Allowance shall be allowed that are not supported by invoice copies.

END OF SECTION

PART 1 - GENERAL

1.1 GENERAL PROCEDURES

.1 Changes in the Work ordered by the Consultant in accordance with the General Conditions of the Stipulated Price Contract shall be valued in accordance with the General and Supplementary Conditions of the Stipulated Price Contract and as more fully specified herein.

.2 The standard documentation for effecting changes in the Work shall be as follows:

.1 Consultant's Notice of Contemplated Change issued to the Contractor on standard form and accompanied by necessary Drawings, Schedule, Details and Specifications.

.2 Contractor's Quotation submitted to the Consultant showing amount by which the Contract Sum shall be adjusted by way of increase or decrease if the change is ordered.

.3 Consultant's formal Change Order issued to the Contractor on Standard Form after Owner's approval. Formal Change Order becomes valid when signed by Consultant, Contractor, and Owner.

.3 Where a change is not expected to result in an increase or decrease to the scope or cost of work, the Consultant may issue such change as a Jobsite Instruction. Should the Contractor determine that any part of a Jobsite Instruction will result in extra costs, or credits, they shall notify the Consultant, and request the issuance of a Notice of Contemplated Change for the relevant portion of the work. A Jobsite Instruction does not authorize work which will result in a change in the Contract Price.

.4 Standard form of Jobsite Instruction, Notice of Contemplated Change and Change Order may be viewed at the Consultant's office during normal working hours.

1.2 VALUATION OF CHANGES

.1 Quotations submitted by the Contractor in response to Consultant's Notice of Change shall be fully detailed and itemized to facilitate checking and processing by the Consultant. Quotations shall be submitted in triplicate and shall:

.1 List Work proposed to be carried out by Contractor's Own Forces showing labour, material, and equipment charges together with quantities and costs (unit rates if applicable) in the assessment of such charges.

.2 List Work proposed to be carried out by Subcontractors showing the amount quoted by each Subcontractor as verified by the Subcontractor's quotation which shall show labour, material, plant and equipment charges together with quantities and costs (unit rates if applicable) upon which the quotation is based.

.3 In evaluating a change, the net cost shall be the net difference in quantity between the original and revised Work. For example: If the change affects the omission of $3m^3$ and the addition of $4m^3$ of an item, the value of the change will be assessed by applying the net difference of $1m^3$ (extra) and applying the appropriate mark-up specified herein.

.2 Unit rates are only applicable if they have been accepted by the Owner in advance and included in the Contract.

.3 Where unit rates are not established in the Contract, quote costs as follows:

.1 material prices shall be the net price paid by the Contractor (or Subcontractor) after deduction of all trade discounts and the like other than reasonable discount for prompt payment.

.2 plant and equipment costs shall not be more than rates quoted in the latest edition of "Rental Rates on Contractor's Equipment" published by the Canadian Construction Association.

.3 labour costs shall be the actual rate paid to the workers in accordance with the fair wage provision of the Contract plus a “fair wage burden” mark-up of thirty-eight percent to cover Welfare contribution, Pension contribution, Vacation Pay, Trade Improvement Fund, Promotional Fund, Training Fund, Supplementary Unemployment Benefits, Check Off, Apprenticeship, Trust Fund and similar labour contract payments; Worker's Compensation Insurance, Canada Pension Scheme and other statutory charges on labour.

.4 Unless otherwise specified in the Form of Tender, unit rates quoted in Tender and incorporated in the Contract shall include the “fair wage burden” for labour as specified in paragraph 1.2.3.3 hereof, but shall be exclusive of mark-up for overhead and profit.

.5 Where Contract unit rates (if applicable) are to be modified:

.1 Where a change involves an extra/credit of more than $10,000.00 (using Contract unit rates), a new unit rate must be negotiated to reflect a fair rate considering the volume of work involved.

.6 “Overhead”, means all expenses to carry on work, except items included in the cost as defined above, and shall include but shall not be limited to: use of Plant, tools; administrative and supervisory staff; personal vehicles, travel; bonds, insurance; health and safety protocols ; and closeout submissions.

.7 The maximum mark-ups for overhead and profit may be applied, as appropriate, to the net costs assessed as above where the effect of the proposed change is an increase in the Contract Sum. If the effect of the change is a decrease in the Contract Sum no mark-up shall be applied. Maximum mark-ups for overhead and profit shall be as set out in the Supplementary Conditions to CCDC2-2020, included the Owner’s Request for Tender.

.8 When work deleted from the Contract is later added back into the Contract, additional overhead and profit will not apply to the reinstated work. Overhead and profit amounts are not included in credits and so remain included in the Contract amount.

.9 It shall be understood and agreed that the mark-ups specified above shall be deemed to provide for payment in full for all items that in the custom of the Construction Industry in Ontario are considered to be site or head office overhead, profit, supervision, administration and labour costs.

.10 Claims for extras will not be considered unless they can be verified by the Consultant. Site work, excavation, backfill, footings and all below grade work must be visually inspected by the Consultant and documented by an independent third party (ie Surveyor) BEFORE the work is hidden.

.11 The signing of a Change Order by all parties shall be deemed to be formal acceptance by the Owner of the Contractor's quotation. Following the issue of a Change Order the Owner will not entertain claims for extra payments due to errors alleged to have been made in the Contractor's Quotation.

.12 Under no circumstances will a claim for extra be considered if it is for work recommended by the Inspection Company unless the Consultant has been advised and his approval obtained PRIOR TO THE EXECUTION OF THE WORK.

END OF SECTION

1.1 GENERAL

.1 Products, materials, equipment, and methods of construction included in the Contract Documents are to be used in the execution of the Work of this Contract unless otherwise accepted by the Consultant in writing. Substitute products and materials may not be ordered or installed without written acceptance from the Consultant.

.2 Changes to products or materials which are proposed by the Contractor during the execution of the Contract are considered "Requests for Substitution". Requests for Substitutions are to be submitted only by the Contractor.

1.2 RELATED WORK

.1 Substitution Request Form Section 01 25 05

1.3 REQUESTS FOR SUBSTITUTIONS

.1 Submit a completed Substitution Request Form, accompanied by the information and documentation outlined below, for evaluation by the Consultant.

.2 A Request for Substitution shall include the following information:
- .1 Data sheets for both the specified item and the proposed substitution.
- .2 Complete description of the proposed alternative product or material, including:
  - .1 Laboratory tests results
  - .2 dimensions, gauges, weights, etc.
- .3 Comparison chart outlining the similarities and differences between the specified products and the proposed substitute product.
- .4 An explanation of how the proposed substitute differs from the specified product
  - .1 in physical properties
  - .2 in quality and performance
- .5 A list of any effects the proposed substitution would have
  - .1 on service connections (wiring, piping, ductwork, etc.)
  - .2 on the work of other trades
  - .3 on construction Schedules
- .6 Evidence that manufacturers warranties and guarantees for the proposed substitutes are the same, or exceed those required under the Contract.
- .7 Information on the availability of maintenance services and replacement materials for proposed substitute.
- .8 Names, addresses, and phone numbers of fabricators and suppliers for proposed substitute(s).
- .9 References who can attest to the quality of the product..
- .10 Confirmation that the proposed substitution, if accepted, would have no cost impact, or indication of a credit (or extra cost) associated with the substitution.

.3 Submissions of Requests for Substitution must be received by the Consultant well prior to any shop drawing submissions.

.4 The Shop Drawing process is not an acceptable means of requesting a substitution, and submission of drawings for products that have not been accepted will result in the automatic rejection of the Shop Drawing submission.

.5 The burden of proof of the merit of the proposed substitution lies with the Contractor.

.6 Substitution requests deemed incomplete or incorrect by the Consultant will be rejected.

.7 The Consultant may require the submission of further information in order to make an informed determination on the suitability of the proposed substitution. Allow a minimum of 10 working days, upon receipt of all required information, for the Consultant's decision. Substitutions requested too late, not allowing sufficient time for thorough review by the Consultant, will be rejected.

.8 The Owner's decision, based upon recommendations of the Consultant, of acceptance or rejection, of a proposed substitution shall be final.

END OF SECTION

Substitution Request No. _____	Date: _____
Specification Title:	
Specification Section No.:	Subsection/Paragraph:
Description of Proposed Substitute Product or Material:	
Manufacturer: Manufacturer's Local representative: Contact Name: Phone:	Email:
Product History: ☐ < 2 years old ☐ 2-4 years old ☐ 5-10 years old ☐ > 10 years old	
Differences between proposed substitution and specified product:	
Reason for substitution request:	
Affects of Substitution on other Parts of the Work:	
Provide Submittals in accordance with Section 01 25 00 Substitution Procedures. Attachments: ☐ Product Data Sheets ☐ Written Description ☐ Comparison Chart ☐ Drawings	☐ Samples ☐ Test reports ☐ Written References ☐ _____

References:

Project: _____ Date installed: _____

Address: _____

Owner: _____ Architect: _____

Project: _____ Date installed: _____

Address: _____

Owner: _____ Architect: _____

Total Change to Contract Price: $_____ Credit / Extra

Change to Contract Time: Add / Deduct _____ days

The undersigned agrees that:

- we have thoroughly investigated the products proposed as substitutes and find them to be equal or superior to the specified products in all aspects of quality and suitability to the project;
- the proposed substitution will have no adverse effects on the work of other trades and no additional claims will be made for other work affected by the substitution;
- the proposed substitution does not adversely affect dimensions or required clearances;
- the warranty and availability of maintenance parts/service are equal to or better than for the specified products;
- the dollar amount listed above accounts for all costs associated with the substitution, including material and labour costs for any affected work; and
- should the substitution require drawing revisions and/or change documents by the Consultant, fees for this service will be paid by the Contractor.

Signed: _____ Date: _____

Print Name: _____

Consultant Review:

☐ Accepted ☐ Accepted as noted ☐ Substitution Rejected

Comments:

Signed: _____ Date: _____

Owner Review:

☐ Accepted ☐ Accepted as noted ☐ Substitution Rejected

Signed: _____ Date: _____

PART 1 - GENERAL

1.1 SITE SUPERVISOR

.1 The Contractor shall be fully responsible for co-ordinating and expediting the work of all Subcontractors and shall employ a qualified Site Supervisor who shall be in full time attendance on this project.

.2 Prior to the Preconstruction Meeting, the Contractor shall inform the Consultant of their choice for Site Supervisors and shall provide resumes outlining qualifications and related work experiences.

.3 Site Supervisor shall have recent, previous experience with renovation or addition projects involving occupied buildings including (but not limited to) school construction, sites with students, tenants, employees, retail customers, pedestrian and vehicular traffic.

.4 The Supervisors must be assigned to projects for the duration of the construction period, until the buildings are fully occupied by the Owner.

.5 The Owner and the Consultant reserve the right to reject the proposed Supervisors should they feel that they are not fully qualified to assume the responsibilities of the positions.

.6 There shall be a minimum of one full time Site Supervisor dedicated to the site.

.7 Site Supervisor must carry a cell phone at all times during construction with the ability to be reached directly during all work hours and the ability to have voicemail recorded during all non-work hours including weekends and holidays.

.8 Once the Supervisors are confirmed, there will be no change permitted without the written consent of the Consultant.

1.2 CONSULTANT/CONTRACTOR MEETING

.1 Prior to the commencement of the Work, the Contractor together with the Consultant shall mutually agree to a sequence for holding regular "site meetings" on same day (to be determined) of every second week.

1.3 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 requested by the Consultant.

.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 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 items which, in the Board's, Consultant's and Contractor's opinion, require clarification.
.7 Exchange names & addresses of all key personnel representing Owner, Consultant, Contractor and Subcontractors.
.8 Identify Consultant's inspection requirements.

1.4 **PROJECT MEETINGS**

.1 Consultant shall Chair project meetings on Site, on a regular basis and will issue minutes to Owner's Representative, Consultants, and Contractor.

.2 Consultant shall take minutes of meeting showing:
.1 List of persons attending.
.2 Decisions taken.
.3 Instructions required or issued - Allocating responsibilities to action items.
.4 All matters discussed.
.5 Schedule Update - Progress, Delays.

.3 Contractor shall provide suitable on site accommodation for meeting, attend all meetings, arrange for attendance of all necessary Subcontractors, and distribute minutes of previous meeting to Subcontractors and Suppliers as appropriate.

.4 The Contractor's representatives at site meetings must include the project co-ordinator as well as site Supervisor.

.5 Contractor shall hold regular co-ordination meeting with Subcontractors and shall chair and minute each meeting. Copies of minutes shall be distributed to relevant Trades and Consultants and Owner.

.6 In addition to jobsite meetings, Contractor shall arrange for, chair, and record safety meetings and regular meetings with his Subcontractors and suppliers. He shall distribute copies of the minutes of these meetings to all Subcontractors, Owner and Consultant.

1.5 **ON SITE DOCUMENTS**

.1 The Contractor shall maintain the following documents, up to date, in the site office:

.1 Contract Documents
.2 Reviewed Shop Drawings - Printed in full colour or redline
.3 All instructions and changes, i.e. Work Authorization, Jobsite Instructions, Notices of Contemplated Change, Change Orders, etc.
.4 All inspection and test reports
.5 Permit drawings and specifications
.6 Authorizations, approval documents, permits, special rulings, etc., issued for the project by Authorities Having Jurisdiction.
.7 Details of tested assemblies being used on the project; ULC, cUL, etc.
.8 As-Built drawings.

.2 Confirm with building inspector, at the commencement of construction, what documents are required for submission both during construction and for occupancy. Keep copies of such documents on site. Refer also to Section 01 41 00, Regulatory Requirements.

.3 Documents listed above shall be printed, full size documents, not only digit format.

.4 Maintain copies of Regulating Documents referred to in the specifications, up to date, in the site office.

.5 Maintain a file of Material Safety Data Sheets (MSDS) for all materials being used on site and make available to all concerned, in the site office.

END OF SECTION

PART 1 - GENERAL

1.1 SCHEDULE

.1 Within thirty (30) days of contract award, submit a detailed construction schedule. Base the submission on the commencement of completion dates of the Contract and required phasing, and indicate specified restraints and milestones, activities and durations for shop drawing submission and approval, testing, fabrication and delivery, construction sequence and timing, interdependencies and constraints. Include the procurement activities for major elements. Ensure the participation of all major Subcontractors and Suppliers. Schedule must include reasonably detailed breakdown.

.2 Schedule shall show:

.1 Commencement and completion dates of Contract.

.2 Commencement and completion dates of stipulated phases.

.3 Commencement and completion dates of Trades.

.4 Order and delivery times for materials and equipment, where possible.

.5 Dates for submission of Shop Drawings, material lists and samples.

.6 Any other information relating to the orderly progress of Contract, considered by Contractor to be pertinent.

.3 The schedule shall be reviewed and updated at every Site meeting.

.4 Include with each update a written report of activity progress reflected in the revised Schedule, and the corrective actions which have been made or are to be taken to maintain progress on the schedule in the future, anticipated delays, resources availability, schedule changes, and work to be completed in the next 2 month period.

1.2 UPDATING AND MONITORING

.1 Set up format of Construction Schedule to allow plotting of actual progress against scheduled progress.

.1 Allow sufficient space for modifications and revisions to the Schedule as Work progresses.
.2 Format shall be approved by the Consultant.

.2 Display copy of Schedule in Site office during complete construction period and plot actual progress weekly.

.3 Updating:
.1 Arrange participation, on Site and off Site, with Subcontractors and Suppliers, as and when necessary for the purpose of updating schedule and monitoring progress.
.2 Conduct reviews of progress and update schedule, distributing copies to Consultant, Owner and Sub-Trades at least once a month or as directed by Consultant.

1.3 **PROGRESS REPORTS**

.1 Keep a permanent written report on the Site of progress of the Work. This record to be open to review by the Consultant. A copy to be furnished to the Consultant upon request.

.2 Indicate daily the number of persons engaged on the work (including subtrades) and the division and section of the work upon which each group of workers is engaged, in sufficient detail to record dates of construction of each particular section of work.

.3 Record to show dates of commencement and completion of trades and parts of the work coming under the Contract, including reports on daily weather conditions, excavation work, erection and removal or forms, and other similar pertinent information.

.4 Report delays (and potential delays) giving reason for delay and action being taken to resolve the problem.

1.4 **PROGRESS PHOTOGRAPHS**

.1 Concurrently with monthly application for payment, submit 10 electronic format colour images as follows:

.1 Images shall clearly show overall progress of Work.

.2 Images shall be high resolution, properly exposed and in focus; views shall be unobstructed. The Consultants will not accept images which are, in their opinion, substandard and these shall be retaken and resubmitted.

.3 Provide an index, in pdf format, with thumbnail images clearly identified with description of view and date taken.

.4 Images may be submitted on disk, clearly labelled with project name and date, or by dropbox link.

1.5 **QUALITY OF WORK / STATUS REPORTS**

.1 The Contractor shall take full responsibility for the quality of work on site. The Contractor shall furthermore notify workers of deficient work immediately upon receipt of notification of deficiencies by the Consultant, Subconsultants and/or Owner.

.2 The Contractor shall provide a monthly status report on the status of deficiencies identified by the Consultant and Subconsultants. The report shall include a description of each deficiency, status of the deficiency, description of corrective action taken, value (cost) to the correct deficiency and trade (person) responsible for deficiency. The report shall be typewritten on the Contractors letterhead. A copy of the report format shall be submitted at least 2 weeks prior to the first progress draw, for review. Submit monthly status reports with each progress draw.

.3 After Substantial Performance, the Contractor shall continue provide the deficiency status reports on a monthly basis, including updated lists of deficiencies identified by the Owner and consultants.

END OF SECTION

PART 1 - GENERAL

1.1 BEFORE COMMENCEMENT OF WORK

.1 Obtain the documents listed under this heading and supply to Consultant within the time stipulated in the Specification, or if not so stipulated, before issue of the first Certificate.

.1 Performance Bond/Labour and Material Bond.

.2 Insurance Policies required under General Conditions of Contract - Insurance.

.3 Certificates of good standing from the Workplace Safety & Insurance Board for the Contractor and all Subcontractors.

.4 Shop Drawing Schedule.

.5 Permits for temporary structures, hoists, etc.

.6 Schedule of Values: Refer to General Conditions of Contract.

.7 Estimate of monthly progress claims (cash flow schedule).

.8 Construction Schedule.

.9 Equipment Delivery Schedule.

.2 Concurrently, with schedule of values, submit cash flow schedule broken down on a monthly basis, indicating anticipated monthly progress billings for duration of the Contract.

.3 Submit schedule in a format acceptable to the Consultant. Indicate anticipated submission dates and review periods. Highlight critical items.

.4 Submit, in a format acceptable to the Consultant, a list of manufactured equipment complete with order dates, anticipated delivery dates, and dates required on site to meet progress schedule. Update schedule at least once a month or more often if directed by the Consultant. Clearly indicate late deliveries and anticipated impact on construction schedule. Include in schedule required delivery dates for products supplied by Owner.

.5 Schedule of Values:

.1 Before submitting first request for payment, submit a detailed breakdown of the Contract price, as directed by the Consultant and as per the Owner's format. Breakdown must equal Contract price. After approval by Consultant, cost breakdown will be used as basis for progress payments.

1.2 DOCUMENTS AND ACTION REQUIRED DURING PROGRESS OF CONTRACT

.1 Perform the action and/or obtain the documents listed under this heading and supply to the Consultant, within the time stipulated in the Specification or, if not so stipulated, as soon as possible following Consultant's request.

.2 Submit preconstruction survey, required under Section 01 71 23, Field Engineering.

.3 Adjust Cash Allowances by award of separate Contracts, where appropriate.

.4 Documents specified under Section 01 10 00, General Instructions and Section 01 33 23, Shop Drawings, Product Data and Samples.

.5 Progress photographs, submitted concurrently with monthly application for payment. Refer to Section 01 32 00.

.6 Any permits required from Authorities Having Jurisdiction enabling Owner to occupy the work (or part thereof) prior to Substantial Performance of the Contract.

.7 As-Built Documents:

.1 The Owner requires as-built documents for all architectural, structural, mechanical and electrical changes on completion of the construction.

.2 The Contractor, and mechanical and electrical Subcontractors shall obtain, from the Consultant, a complete and separate set of white prints of Contract Drawings and Project Manual to keep on the site at all times.

.3 The drawing prints shall be marked up by responsible personnel of the Contractor and Subcontractors to record clearly, neatly, accurately and promptly showing all locations of buried structural, mechanical and electrical work and deviations from the contract documents.

.4 The Project Manual shall be similarly marked up to reflect deviations from the Contract Documents, as well as indicate materials used, colours selected, etc.

.5 The accurate location, depth, size and type of each underground utility and service line shall be recorded before concealment to ensure accurately directed future access to these buried lines.

.6 The as-built documents will be reviewed at regular intervals by the Consultant and the quality of performance by the Contractor and Subcontractors in developing these records will be taken into consideration when reviewing the monthly applications for payment submitted by the Contractor.

.7 Prior to the date of Substantial Performance, request from the Consultant updated drawings incorporating all changes made to the building through Change Orders and Jobsite Instructions. Transfer all recordings from the white prints to these updated drawings and return them to the Consultant, as specified in Section 01 78 00, Close-out Submittals.

.8 Mark "as-built" changes in red coloured ink.

.9 Record following information:

.1 Depth of various elements of foundation in relation to first floor level if different from contract documents.

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

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

.4 Field changes of dimension and detail.

.5 Changes made by Change Order or Supplementary Instructions.

.10 Clearly mark each of the drawings,"Project As-Built Record Copy".

.11 Final completion of these Drawings shall be a condition precedent to the issuance of Consultant's final payment certificate.

.12 Refer to Mechanical and Electrical Specification Divisions for more specific requirements regarding preparation and submission of final Record Drawings.

END OF SECTION

PART 1 - GENERAL

1.1 SCHEDULE

.1 Within 5 working days after award of Contract, prepare and submit to Consultant for comment, a schedule fixing the dates for the submission of all Shop Drawings, product data, and samples.

.2 Allow reasonable promptness for Consultant to review submissions, exclusive of time required for inter-office transmissions.

.3 All shop drawings must be reviewed and stamped by the Contractor prior to submission to the Consultant.

1.2 GENERAL

.1 Submit to Consultant, for review, Shop Drawings, Product Data, Samples, and other required submittals specified.

.2 All shop drawings and related submittals must be reviewed and stamped by the Contractor prior to submission to the Consultant.

.3 Until submittal is reviewed, Work involving relevant product may not proceed.

.4 Do not use for construction, Shop or setting Drawings or diagrams which do not bear Consultant's stamp and name of reviewer.

.5 Shop drawing reviews do not authorize changes in cost or time, which may only be accomplished by an appropriate Change Order issued through the Consultant.

.6 Shop drawings shall be for products as specified or otherwise approved by the Consultant. The shop drawing process is not a means of requesting substitutions. Refer to Section 01 10 00, General Instructions, for the process for requesting approval of substitutions.

.7 Submission and subsequent review of Shop Drawings constitute a service and does not entitle the Supplier or Subcontractor to the right to remuneration until the materials are supplied and installed on the Site in accordance with the Contract.

.8 The Contractor must include for delivery and pick up of shop drawings to/from the Consultant by hand or courier.

.9 Only one (1) copy of reviewed shop drawings will be returned to the Contractor.

.10 The Contractor must include for reproduction of shop drawings *after* review by the consultants.

1.3 SHOP DRAWINGS

.1 Drawings shall be copies of original drawings prepared by Contractor, subcontractor, supplier or distributor, for the work of the Contract which illustrate appropriate portions of the Work. Shop drawing submissions shall show pertinent information for incorporation of the products and equipment, including the following, as applicable:

.1 fabrication details

.2 dimensioned layout drawings, including clearances, with site dimensions
.3 relationship to adjacent work
.4 setting or erection details
.5 performance requirements
.6 operating weights of equipment
.7 installation instructions
.8 service connection requirements, including wiring diagrams
.9 single line and schematic diagrams
.10 additional information as may be specified in applicable Specification Sections.

.2 Note that some shop drawings are required to be approved by a Professional Structural Engineer in the Contractor's employ. These include:
.1 swing gate
.2 retaining wall

.3 Submit Shop Drawings with transmittal forms listing:
.1 the project name and number
.2 the names of the manufacturer, supplier, subcontractor
.3 the applicable Drawing numbers
.4 the number of copies
.5 the names of the items included the submittals
.6 number of Specification section to which the Shop Drawings refer
.7 dates and revision numbers, and submission numbers

.4 All dimensions on shop drawings must be in metric.

.5 Where approvals are required by Authorities having jurisdiction, submit Shop Drawings to those authorities and obtain the approvals required.

.6 On Shop Drawings for fire rated assemblies, show required fire rating and ULC design numbers.

.7 Hard Copy Submission:

.1 Submit two (2) to five (5) copies of printed shop drawings as follows:

.1 Submissions shall be in sufficient quantities for distribution to all reviewers, plus one copy to be returned to the Contractor for reproduction and distribution.

.2 The prime Consultant requires one copy of every submission, of all disciplines.

.3 Each sub-consultant, of each discipline, will retain one copy of the shop drawings. Where one sub-consultant is responsible for the review of more than one discipline, they will require multiple copies, as applicable.

.4 For architectural submissions which do not need to be reviewed by sub-consultants, only two copies are required.

.2 Refer to sections prepared by the sub-consultants for possible variations on these requirements.

.8 Email Submission:

.1 Submittals that are formatted for 11" x 17" (279 x 432mm) sheets or smaller may be submitted by email.

.2 Submittals must be submitted in the same size and scale as they were originally prepared. Drawings may not be reduced in size for email transmission.

.3 If acceptable to the individual reviewers, larger format submittals and larger volume submittals may be reviewed by email submission. The Contractor must subsequently print and submit full sized, red line copies of such reviewed documents to the Consultant.

.4 Email submissions must be in pdf format and must be high quality documents, preferably generated by computer from the original documents (rather than scans of printed documents). If digital submissions are of insufficient quality, hard copies will be required.

.5 Emailed documents shall be reviewed and stamped digitally by the Contractor, or accompanied by a separate sheet from the Contractor listing the documents reviewed and bearing the Contractor's review stamp, along with copies of any revisions made.

.6 Email submission is only used as a convenient means of distributing drawings, in lieu of sending hard copies by courier. Reviewed drawings must still be printed for job site files, record copies, etc. All site copies shall be red line prints or colour prints.

.9 Drawings shall be of a size and quality which will be readily reproduced. Shop drawings must be certified to have been reviewed and corrected by Contractor and sub-contractor responsible for forwarding to the Consultant.

.10 Shop drawings are to be to scale. Scale shall be large enough to adequately review details included. Provide site measured dimensions on drawings wherever possible.

.11 All requirements for shop drawings apply also to resubmissions of shop drawings, as may be required by the Consultant.

.12 Revise all reviewed shop drawings to incorporate Consultant's comments. One complete set of final, revised Shop Drawings, used for construction, shall be submitted to the Consultant.

.13 Shop Drawings are required for the following items:

Pavement Markings
Playground Protective Surface
Site Furnishings
Exterior Plants
Synthetic Grass Surface
Subgrade drainage and area drains

.14 Refer also to the General Conditions of the Contract and Part 5 of the Request for Tender document, Supplementary Conditions to CCDC2-2008.

1.4 **PRODUCT DATA**

.1 Certain Specification Sections specify that manufacturer's standard schematic drawings, catalogue sheets, diagrams, schedules, performance charts, illustrations and other standard descriptive data will be accepted in lieu of Shop Drawings.

.2 The above will be accepted if they conform to the following:
- .1 Delete information which is not applicable to project.
- .2 Supplement standard information to provide additional information applicable to project.
- .3 Show dimensions and clearances required.
- .4 Show performance characteristics and capacities.
- .5 Indicate operating weight of equipment.
- .6 Show wiring diagrams and controls.
- .7 Add to standard sheet the Project identification data.

1.5 **SAMPLES AND MOCK-UPS**

.1 Where specified, shown or considered necessary, submit duplicate samples for Consultant's approval.

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

.3 Samples must correspond in every respect to materials supplied for project.

.4 Construct field samples and mock-ups at locations acceptable to Consultant.

.5 Construct each sample or mock-up complete, including work of all trades required to finish work.

.6 Do not proceed with fabrication or delivery of materials until samples are approved.

.7 Reviewed samples or mock-ups will become standards of workmanship and material against which installed work will be checked on project.

.8 Approval of samples does not imply acceptance of finished work.

1.6 **CONTRACTOR'S RESPONSIBILITY**

.1 Prior to submission to the Consultant, review all shop drawings, samples, product data, and other required submittals as follows:

- .1 Verify that the submission is for products as specified, or otherwise approved by the Consultant.
- .2 Ensure that the submission is complete.
- .3 Note any potential interference issues and co-ordinate with the trades to avoid these conflicts.

.4 Verify:
.1 Field measurements.
.2 Field construction criteria.
.3 Catalogue numbers and similar data.

.2 Coordinate each submittal with requirements of Work and Contract Documents. Refer to Section 01 10 00, General Instructions, and the subsection on Coordination.

.3 Notify Consultant, in writing at time of submission of any deviations in submittal from requirements of Contract Documents.

.4 Stamp, initial or sign each Drawing, certifying approval of submission, verification of field dimensions and measurements and compliance with Contract Documents, prior to submission to the Consultant(s).

.5 The Contractor shall be responsible for reproducing and distributing reviewed shop drawings, except for those copies required by the Architect and Consultants.

.6 After Consultant's review, distribute copies as follows:

.1 Job Site file (2 copies) - colour or redline copies
.2 As-built documents file.
.3 Other prime contractors.
.4 Subcontractors.
.5 Supplier.
.6 Fabricator.
.7 Authorities having jurisdiction, where required by Codes and/or By-Laws, i.e. structural steel and sprinklers.
.8 Owner’s Maintenance Manual (revised, as-built copies).

.7 Distribute samples as directed by the Consultant.

.8 Ensure that all samples are approved by authorities having jurisdiction, supplier for correct application in Project, and other parties such as Owner in time to permit approval prior to ordering of quantity delivery to Site.

.9 The Contractor shall advise all Trades, Subcontractors and suppliers of the limits of the Consultant's responsibility with respect to Shop Drawings and other submittals, as detailed below.

1.7 **CONSULTANT'S RESPONSIBILITY**

.1 With reasonable promptness from the receipt of samples and Architectural shop drawings , the Consultant shall review them and return them to the Contractor. Allow 15 working days for review of shop drawings.

.2 Review by the Consultant 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 inherent in the shop drawings, responsibility for which shall remain with the Contractor, and such review shall not relieve the Contractor of his responsibility for errors or omissions in the shop drawings or of his responsibility for meeting all requirements of the Contract Documents.

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

.3 Shop drawing markings shall be interpreted as follows:

.1 Shop drawings marked "REVIEWED" by Consultant and/or Subconsultants are released for construction.

.2 Shop drawings marked "REVIEWED AS NOTED" by the Consultant or his Subconsultants are also released for construction, after revisions noted are made; with final copies sent to the Consultant.

.3 Shop drawings marked "REVISE AND RESUBMIT" by the Consultant or his Subconsultants are NOT released for construction and must be resubmitted after being revised in accordance with the consultants' comments.

.4 Shop Drawings marked with the Consultant's "RECEIVED" stamp only have not been reviewed by the Consultant.

.4 Review by the Architect does not in any way constitute review of the design of engineering elements, which form part of the Contract Document's prepared by others.

.5 Shop drawings for products that are not a specified item, or an approved substitution, will be rejected without being reviewed.

.6 Shop drawings which have not been requested will be returned to the Contractor with no action taken by the Consultant.

.7 The Architect will use the following stamps in reviewing Shop Drawings:

Date:

RECEIVED

MOFFET & DUNCAN ARCHITECTS INC.

"Review by Moffet & Duncan Architects Inc. does not in any way constitute review of the design of engineering elements, which form part of the Contract Documents prepared by others."

MOFFET & DUNCAN ARCHITECTS INC.

REVIEWED	☐
REVIEWED AS NOTED	☐
REVISE AND RESUBMIT	☐

"This review by Moffet & Duncan Architects is for the sole purpose of ascertaining conformance with the general design concept. This review shall not mean that Moffet & Duncan Architects Inc. approves the detail design inherent in the shop drawings, responsibility for which shall remain with the Contractor submitting same, and such review shall not relieve the Contractor of his responsibility for errors or omissions in the shop drawings or his responsibility for meeting all requirements of the Construction and 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 co-ordination of the work of all sub-trades."

MOFFET & DUNCAN ARCHITECTS INC.

REVIEWED BY	
DATE	
PROJECT No.	

END OF SECTION

PART 1 - GENERAL

1.1 CONSTRUCTION SAFETY

.1 Observe and enforce construction safety measures required by the National Building Code of Canada, Canadian Construction Safety Code, Ontario Occupational Health and Safety Act, Workplace Safety & Insurance board (WSIB) and Municipal Statutes and Authorities.

.1 The Contractor is again reminded that the Contractor is responsible for Occupational Health and Safety on this project. The items listed below are only guidelines of the Owner's expectations in this regard and not to be construed to be comprehensive or total in nature.

.2 In particular, the Ontario Construction Safety Act, the regulations of the Ontario Department of Labour and Ontario Hydro Safety Requirements shall be strictly enforced.

.3 In event of conflict between any provisions of above authorities the most stringent provisions will apply.

.4 The Owner will take every reasonable precaution to prevent injury or illness to students, employees and the public, participating in Owner activities, or performing their duties. This shall be accomplished by providing and maintaining a safe, healthy working environment and by providing the education necessary to perform these activities or duties safely.

.5 The Owner is also vitally interested in the health and safety of Contractors and their workers performing work for the Owner. Cooperation and support of the Contractor in the protection of the workers from injury or occupational disease is a major, continuing objective of the Owner. To achieve these goals, the Owner, in concert with the Contractors, will endeavour to make every effort to ensure that the Contractors provide a work site which is a safe and healthy work environment. The Owner insists that all Contractors and their workers are dedicated to the continuing objective of reducing risk and injury.

.6 The Contractor covenants and agrees to comply with all statutory and other obligations, including without limitation, the provisions of the Occupational Health and Safety Act (Ontario) and all Regulations thereto, and all amending and successor legislation, in connection with all work performed by either the Contractor, Sub-contractors, or any Other Contractor on, or in connection with, the Project.

.7 Without limiting the foregoing, for the purposes of this Contract, the Contractor agrees that it shall be the "constructor" of the Project within the meaning of the Act, and as such, shall assume all the obligations and responsibilities, and observe all construction safety requirements and procedures, and duties of inspection imposed by the Act on the "constructor", as therein defined, for all work and services performed by the Contractor, Subcontractors and Other Contractors on or in connection with the Project. The Contractor further covenants and agrees that the Owner and its existing and former officers, trustees, employees and agents, and their respective heirs, executors, administrators, successors and assigns shall be released from any obligations or liabilities otherwise imposed on the Owner, or on any of them, pursuant to the Act in connection with the Project, and that the Contractor shall assume all liability and responsibility in connection with same. The Contractor agrees to save harmless and indemnify the Owner from any losses, damages, costs and expenses of any kind, or nature whatsoever, including all legal expenses, and all defence costs and related expert or consulting fees, incurred

by the Owner, or any of them, arising in connection with the failure, default, or inability of the Contractor of the Owner, or any of them, to comply with any of the aforementioned statutory, or other legal requirements, or arising in connection with any breach by the Contractor of any of its covenants, agreements and obligations under this Contract.

.8 The Contractor shall inform and instruct Other Contractors that they, while performing work on this project, are under the authority of the Contractor. Other Contractors are to discuss and co-ordinate with, and follow instructions from, the Contractor on all matters of site access, vehicles, deliveries, storage, temporary facilities, coordination with the work of other subcontractors, work methods, scheduling, labour conditions, construction safety, environmental protection, security and all other matters which relate to the safe and proper execution of construction work.

.9 The Contractor shall ensure that all supervisory personnel on job site are fully aware of the procedures and requirements outlined herein and comply with all requirements specified.

.10 All contractors are responsible to ensure that all machinery and/or equipment are/is safe and that the workers perform their tasks in compliance with established safe work practices or procedures. Workers must receive adequate training in their specific work tasks to protect their health and safety.

.11 The Contractor shall be responsible for all persons and companies performing work, including other Contractors, on this project, at all times, up to and including, the date of Substantial Performance of the Work. Authority for coordination and instructions relating to all matters which relate to the safe and proper execution of construction work shall rest with the Contractor. The Contract Price will include the Contractor's fees for the coordination and supervision of the work of all Other contractors.

.12 In addition to the responsibility of all contractors as outlined above, Subcontractors will be held accountable for the health and safety of workers under their supervision.

.13 Every worker must protect his/her own health and safety by working in compliance with the law and with safe work practices and procedures established by the authorities having jurisdiction.

.14 All sections of the Occupational Health and Safety Act for Industrial Establishments, latest edition, and the Occupational Health and Safety Act for Construction Projects, latest edition, shall be enforced, by the Contractor, in their entirety, throughout the duration of the construction project.

.15 The Contractor shall provide the Consultant with the telephone number where the Contractor or his representative can be reached at any time, day or night, for the duration of the contract.

.16 Where an accident, explosion, or fire causes a person injury at the work place, and the worker is disabled from performing the usual task, the Contractor shall prepare a written notice and shall forward same to the Ministry of Labour within four days of the occurrence with a copy to the health and safety representative or the Joint Health and Safety Committee, containing such information and particulars as may be prescribed.

.1 Where a person is killed or critically injured from any cause at the work place, the Contractor shall immediately call the Ministry of Labour. A written notice from the Contractor shall be given to the Ministry of Labour within forty-eight hours after the occurrence, containing such information and particulars as may be prescribed, with copies to the Consultant and the Owner's Representative.

.2 The Contractor is advised that the accident scene is under the jurisdiction of the Ministry of Labour and no wreckage, articles, etc., shall be interfered with, disturbed, destroyed, altered or carried away at the scene, or connected with the occurrence, until the Ministry of Labour has given permission.

1.2 **REPORT ACCIDENTS**

.1 Promptly report in writing to the Consultant all accidents which cause death, personal injury or property damage, arising out of or in connection with the performance of the work on or adjacent to the site. Where death or serious injuries or serious damages are caused, the accident shall be reported immediately by telephone or messenger to the Consultant and to the relevant public authorities.

.2 If any claim is made by anyone against the Contractor or Subcontractor on account of any accident, the Contractor shall promptly report the facts in writing to the Consultant giving full details of the claim.

1.3 **FIRST AID FACILITIES**

.1 Provide at the site the equipment and medical facilities necessary to supply first-aid service to anyone who may be injured in connection with the Work, and to conform to the requirements of the authorities having jurisdiction over the Work.

1.4 **COVID-19 PREVENTION**

.1 Submit a work plan outlining COVID-19 prevention measures. Workplace strategies shall include, but not be limited to, social distancing, provision of personal hygiene facilities, posting of relevant information, and other measures recommended by the government of Ontario, the government of Canada, the local municipal government, and their respective ministries, agencies, and departments. Plan shall apply to all Contractor’s employees, their subcontractors and suppliers, testing and inspection personnel, as well as the Owner’s employees, the Consultant and Subconsultants and their employees, and the general public.

.2 Keep a supply of personal protective equipment, and masks in particular, on site for use as needed. Do not allow workers to work in close contact without personal protective equipment.

1.5 **FIRE SAFETY REQUIREMENTS**

.1 The appropriate clauses of the Ontario Building Code, Ontario Fire Code, National Building Code of Canada and National Fire Code relating to fire safety and protection shall be strictly followed.

.2 Provide and maintain free access to temporary or permanent fire hydrants acceptable to local fire department.

.3 Provide sufficient temporary standpipes and connections, fire hose, valves, temporary cabinets, extinguishers, etc. to comply with the requirements of the governing Municipal and Provincial authorities.

.4 Make necessary adjustments and modifications to temporary fire protection as required during progress of the work. Remove such temporary work when permanent system is installed and operating.

.5 Conform to "Guidelines for Maintaining Fire Safety During Construction in Existing Buildings", provided by the Office of the Ontario Fire Marshal.

.1 Maintain existing exits and access to exits. Where an exit must be blocked, provide an alternate exit acceptable to Authorities Having Jurisdiction.

.2 Provide minimum 45 minute rated fire separations at junction between existing corridors in occupied spaces and new corridors under construction. Any required access through these partitions shall be with rated doors, frames with closers and latching.

.3 Maintain exiting fire department access route or provide new, or temporary, access route acceptable to the fire department.

.4 Do not store combustible materials adjacent to existing building or where such materials could pose a fire hazard to the building or the occupants.

.5 Cover existing windows exposed to construction with 16mm gypsum board on steel stud framing, on interior side of such windows. Louvres shall be similarly protected. Replace doors exposed to construction with hollow metal doors.

.6 Where temporary openings are made in existing floors, pack with mineral wool insulation to create temporary fire barrier.

.7 Existing fire alarm system is to be kept operational throughout the construction period. Keep fire department informed of any temporary shutdowns and arrange for alternate fire safety measures to be implemented during that period.

.8 Refer to the Ontario Fire Code for requirements for temporary shutdown of fire protections systems, including sprinklers and standpipe systems.

.9 Modify Fire Safety Plan in accordance with the Fire Code, when required to facilitate construction. Such modifications shall be determined in cooperation with the Owner and the local fire department.

1.6 **OVERLOADING**

.1 Ensure no part of Work is subjected to a load which exceeds the design live loads shown on the structural drawings. Ensure that scaffolding and false work are not overloaded. Do not cut load bearing members without approval of Consultant.

1.7 **FALSEWORK**

.1 Design and construct falsework in accordance with CSA S269.1 latest version.

1.8 **VISITORS**

.1 Provide hard hats for use by all visitors.

.2 Ensure all visitor comply with COVID-19 prevention policies.

1.9 **ADDITIONAL REQUIREMENTS FOR OCCUPIED SITES**

.1 The existing school will be occupied throughout the academic year. When school is in session, additional safety requirements will apply, as outlined below:

.2 Flagman:
- .1 Provide a full-time flagman at each vehicular construction entrance.
- .2 The location of the Flagman shall be coordinated with the Owner, to ensure the safe guarding of staff, students, and the general public.
- .3 Flagman shall be a designated person, not the Site Supervisor or other construction worker, and shall not be changed during the Project unless approved by the Owner.
- .4 Flagman must have means of communication with Site Supervisor (phone or walkie-talkie).
- .5 Flagman shall meet and escort all construction traffic from the site **entrance** into and out of the fenced construction area, from street through entrances to hoarding. No unaccompanied construction vehicles will be permitted on School Board property, outside of construction enclosure.
- .6 Flagman shall control construction parking at the school site. Parking shall be as designated by Owner and school Principal.
- .7 Contractor may provide a temporary shelter for the flagman, if necessary or desired, the cost of which shall be included in the Tender Price.
- .8 Flagman shall be properly outfitted to carry out his duties, with appropriate safety clothing and equipment, including reflective vest, hand-held “Stop” sign and a visible identification tag.

.3 Access Control:
- .1 The Contractor shall instruct all suppliers and subcontractors that they are required to contact the Site Supervisor by cell phone prior to entering the site, and await escort by the flagman.
- .2 Site Supervisor shall then advise the flagman to meet and escort the vehicle.
- .3 Gates of construction enclosure must remain closed and locked at all times and only opened for the time required for access/egress of authorized vehicles or personnel.

.4 Site Communication
- .1 The Contractor shall provide the Owner and Principal with an emergency contact telephone number at which the Site Supervisor or other Contractor representative can be contacted directly during work hours and with voicemail available at all other times, including weekends and holidays, which will be checked regularly.
- .2 Site Supervisor and flagman must have means of direct communication available at all times during work hours.
- .3 Contractor shall be in daily communication with the school Principal to determine any activities which may involve safety concerns, whether school related or construction related.

1.10 **SIGNAGE**

.1 Provide signage indicating " Danger - Keep Out", "Hard Hats must be worn at all times", "Safety Shoes must be worn at all times", "No Trespassing", etc., mounted on all sides of Site, and additional signs as necessary to adequately warn the public and workmen of the inherent dangers of the site and requirements to maintain personal safety. Safety Signage is also required at all construction entrances

.2 During the school year, signage posted at gates shall state restrictions on hours of entry and egress, as agreed to by the Owner and Principal, and under no circumstances shall construction traffic be allowed within 30 minutes prior to school start, during recess, lunch break, and within 30 minutes after school dismissal.

.3 Post appropriate COVID-19 protection posters, as published by official government agencies, on site, including in all sanitary facilities, in site office, and at site entrance.

END OF SECTION

PART 1 - GENERAL

1.1 HAZARDOUS MATERIALS

.1 The Ontario Occupational Health and Safety Act requires the Owner to provide a list of Designated Substances to all prospective Contractors and they in turn must supply the list to their sub-trades who are likely to handle or disturb the material.

.2 Materials that may be present in the area of construction may include any or all of the following and would be expected in normal construction:

.1 Lead: in paint films, in solder or pipe for drinking water, in solder for other pipe or electrical components

.2 Mercury : found in elemental form in an ampoule in thermostats or in electrical soft switches, as a gas in fluorescent light tubes or in paint films and caulk

.3 Silica: primarily as Quartz, bound in building materials including but not limited to concrete, brick and block.

.3 In accordance with the Ontario Health and Safety Act and regulations enacted under the Act the Contractor and sub-trades shall take appropriate precautions for the building and their work force. Such precautions may include, for the substances listed, the measures outlined below.

.4 Remove, transport, and dispose of hazardous materials in accordance with applicable laws, including the following:

.1 Occupational Health and Safety Act, R.S.O. 1990, c. O.1., including the following regulations made under the Act:

.1 O.Reg. 213/91, Construction Projects, amended to 345/15 and

.2 O.Reg. 278/05, Designated Substance - Asbestos on Construction Projects and in Buildings and Repair Operations amended 479/10.

.2 Regulations for the transport of asbestos waste, including:

.1 Transportation of Dangerous Goods Act, 1992 (1992, c. 34)

.2 Dangerous Goods Transportation Act, R.S.O. 1990, c. D.1

.3 Environmental Protection Act, R.S.O. 1990, C. E.19, and regulations under the Act, including:

.1 O.Reg. 102/94 Waste Audits and Waste Reduction Work Plans

.2 O.Reg. 103/94 Industrial, Commercial and Institutional Source Separation Programs

.3 R.R.O. 1990, Reg. 347: General - Waste Management

.5 Lead:

.1 Any operation involving lead-based paints may potentially produce significant exposures to lead if adequate controls are not provided. Exposure varies with the type of operation being employed.

.2 The presence of lead in building finishes left intact or found peeling in a few locations produces little exposure for workers to lead through contact, inhalation or ingestion.

.3 Operations involving the hand sanding and scraping of lead based paints can elevate exposure through inhalation. The use of a negative pressure respirator equipped with high efficiency particulate air (HEPA) filters is recommended to reduce exposure.

.4 Operations involving the machine sanding or abrasive cutting of paint and other surface coatings containing lead can elevate levels of much finer dust. The spray application of a lead bearing paint or coating produces a respirable fume. These operations increase the likelihood of exposure by inhalation. A negative pressure air-purifying respirator equipped with HEPA filters is recommended for these operations.

.5 Operations involving oxyacetylene torches or other heating operations produces the most significant exposure to lead in particular through inhalation and by contact of lead fumes solidifying on skin. A powered air-purifying respirator equipped with HEPA filters and full body covering is recommended for these operations.

.6 Lead found in solder of other pipe systems and electronic components poses no threat to the work force by inhalation, ingestion or by contact with the exception of maintenance or renovation activities. The maintenance of the pipe or electrical component may produce some exposure to lead fume during the seating on of lead solders but for a short duration of time. Inhalation is the source of entry and exposure is not very significant.

.7 All items identified in this section may be disposed of as regular non-hazardous waste unless concentrated. Metallic lead may be reclaimed through scrap metal dealers.

.6 Mercury

.1 Fluorescent light tubes contain small quantities of mercury gas. These sealed units do not pose any harm in the workplace except in the case of breakage. There are no liquid or residue present after breakage and spill cleaning is not a concern. A recommended practice is to evacuate the work area when breakage occurs. The gas will diffuse in about five to ten minutes and cleanup of the tubes can be performed. Mercury can be taken into the body by inhalation only from this source.

.2 The same precautions as those indicated for lead-based paints would apply to mercury in paints.

.3 Elemental mercury found in ampoules in electrical equipment may be disposed of as regular waste and should be turned over to the Owner for disposal through commercial recyclers. The other forms (light tubes and painted surfaces that have been concentrated) can be disposed of as regular waste.

.7 Silica

.1 Silica is presumed to be present in cement, cement blocks, bricks and mortar of the building. Unless the silica in these materials is reduced to respirable size (5 um or less) and the airborne concentration exceeds the time weighted average exposure of 0.2 milligrams per cubic metre in air, no adverse health effects are expected to occur. Building construction, renovation or demolition do not normally raise excessive exposure to silica with the exception of jack hammering, dry saw cutting or sand blasting. There is little likelihood for the work force to be exposed to excessive levels of respirable silica dust if the material is suppressed with water spray or flow. Respiratory protection is dependent on the type and airborne concentration of respirable silica present in the particular work environment.

.8 Where a friable building material is found enclosed in a wall, floor or ceiling such as fireproofing, insulation on pipe or ducts etc. (that is not fibrous glass) or an acoustical textured material (stucco) or a non-friable material such as cement board or cement pipe, the Contractor shall refer to the Consultant who shall contact the Owner for further direction.

.9 Prior to the disposal of building materials a leachate toxicity test in compliance with Water Management Regulation (Revised Regulation of Ontario 1990/Regulation 347) may be required by the local waster receiving site or the Ontario Ministry of Environment and Energy. Prior to disposal these authorities should be consulted with, and tests performed where required.

END OF SECTION

PART 1 - GENERAL

1.1 REGULATING DOCUMENTS

.1 Conform to the Ontario Building Code (Ontario Reg. 332/12), Ontario Fire Code (Ontario Reg. 213/07), Accessibility for Ontarians with Disabilities Act (Ontario Reg. 191/11), National Building Code of Canada, Canadian Electrical Code (CEC), CSA B44 - Safety Code for Elevators and Escalators, CSA W59 - Welded Steel Construction, The Occupational Health and Safety Act, Ontario (R.S.O. 1990), the National Fire Code, the local municipal Fire Code, and all other applicable Codes and Building By-Laws. Conform to the requirements of the authorities having jurisdiction, such as public utilities. Where required under The Occupational Health and Safety Act, engage a Professional Engineer to design formwork and falsework for concrete.

.2 Contract forms, codes, standards and manuals referred to in these specifications are the latest published editions at the date of close of tenders. Meet or exceed requirements of specified standards.

.3 Provide copies of documents referred to in the Specification for joint use of Contractor and Consultant, on site.

1.2 DOCUMENTS REQUIRED BY BUILDING INSPECTOR

.1 Confirm with building inspector, at the commencement of construction, what documents are required for submission both during construction and for occupancy. Keep copies of such documents on site.

.2 At the time of request for occupancy, submit a complete package of all required documents to the building inspector. The package shall contain all documents required for the inspector's sign off for occupancy, and should be expected to include the following documents:

.1 Copies of Consultant's General Review Reports

.2 Copies of General Review Reports of consulting engineers

.3 Geotechnical testing and inspection reports confirming bearing capacity of soils

.4 Consultant's and engineers' letters confirming project is ready for occupancy in accordance with the provisions of the Ontario Building Code, Division C, section 1.3.3, Occupancy of Buildings.

.5 Structural steel inspection reports certifying conformance to CSA Standards S16, S136 and A660.

.6 Concrete testing reports and inspection reports for reinforcing steel.

.7 Roof inspection reports.

.8 Verification of compliance with tested designs for rated assemblies.

.9 Verification of Fire Protection Systems including:
- .1 Verification of engineer supervised sprinkler, standpipe and hose system testing.
- .2 Material and test certificates for all work, including below ground, in conformance with NFPA-13 and NFPA-14, as applicable.

.10 Verification of Fire Alarm System as follows:
- .1 Testing to CAN/ULC S537
- .2 Installation to CAN/ULC S524
- .3 Monitoring to CAN/ULC S561

.11 Additional documents as required by the municipality.

1.3 SUBMITTALS REQUIRED BY MUNICIPALITY AND REGION

.1 Provide submittals required by the municipal and regional authorities for work on public roadways. Confirm requirements of site plan agreement and site servicing agreement with Consultant.

.2 Submittals required during the construction period typically include the following, which should be considered the minimum requirements:
- .1 Certificate of Insurance.
- .2 Notice of intention to commence construction, 5 business days prior to start
- .3 Construction schedule for construction of municipal and regional services.
- .4 Survey by OLS confirming building levels and locations, with certification, submitted to city prior to building construction (Spec Section 01 71 23, 1.2.5).
- .5 Geotechnical field reports, from P.Eng, verifying adequate bearing capacity and permanent groundwater level, prior to pouring of concrete footings.
- .6 Application to designate fire route.
- .7 Field review reports for retaining walls, from P.Eng.
- .8 Material and compaction testing reports, from P.Eng., for all paving, curbs, and sidewalks on municipal and regional property.

.3 For Submittals required upon completion of the Work, refer to Section 01 78 00, Closeout Submittals.

END OF SECTION

PART 1 - GENERAL

1.1 QUALITY ASSURANCE

.1 Refer also to the Quality Control Provisions of Section 00 10 00, General Instructions.

.2 Provide a system of quality control to ensure that the minimum standards specified herein are attained.

.3 Conform to the quality control requirements included in individual specification sections.

.4 Bring to the attention of the Consultant any defects in the work or departures from the Contract Documents which may occur during construction. The Consultant will decide upon corrective action and state recommendations in writing.

.5 The Consultant's general review during construction and inspection by independent inspection and testing agencies reporting to the Consultant are both undertaken to inform the Owner of the Contractor's performance and shall in no way augment the Contractor's quality control or relieve him of contractual responsibility.

1.2 NOTIFICATION

.1 Give the Consultant advance notice of shop fabrication, field erection and other phases of the work so as to afford him reasonable opportunity to inspect the work for compliance with contract requirements. Failure to meet this requirement may be cause for the Consultant to classify the work as defective.

1.3 DEFECTIVE MATERIALS AND WORKMANSHIP

.1 Where factual evidence exists that defective workmanship has occurred or that work has been carried out incorporating defective materials, the Consultant may have tests, concrete cores, inspections or surveys performed, analytical calculation of structural strength made and the like in order to help determine whether the work must be replaced, Test, inspections or surveys carried out under these circumstances will be made at the Contractor's expense, regardless of their results, which may indicate that, in the Consultant's opinion, the work may be acceptable.

.2 All testing shall be conducted in accordance with the requirements of the Ontario Building Code, except where this would, in the Consultant's opinion, cause undue delay or give results not representative of the rejected material in place. In this case, the tests shall be conducted in accordance with the standards given by the Consultant.

END OF SECTION

PART 1 - GENERAL

1.1 TEMPORARY TELEPHONE AND FAX

.1 Install and pay for all communications services on site, including telephone, internet, computer, printer, and fax machine, for Contractor's own use, and for the Owner's and Consultant's use.

.2 Refer also to Section 01 52 00, Construction Facilities.

1.2 POWER AND WATER SUPPLY

.1 Provide all temporary light and power complete with all wiring, lamps and similar equipment as required for completion of the Work. Provide adequate lighting for all workmen, sufficient for safety and for execution of good workmanship, taking particular care to observe all safety requirements. Adequate temporary lighting will be insisted upon. The Owner will not be liable for any loss, damage, delay, or claims for extra costs resulting from lack of services.

.2 Existing building services may be used, as available. This does not include emergency generators or batteries.

.3 Provide an adequate pure fresh water supply for the use of trades. Run supply pipe from nearest available source and maintain in good condition until the permanent system is installed and ready for use. Provide a sufficient number of faucets on each floor.

.4 Ensure continued water and power supply to adjacent residences and buildings throughout the construction period. Arrange for temporary services, including approvals from authorities having jurisdiction, where any interruption is anticipated.

END OF SECTION

PART 1 - GENERAL

1.1 CONTRACTOR'S SITE OFFICE

.1 Contractor may use space within school during summer work period.

1.2 SANITARY FACILITIES

.1 Furnish and maintain in a sanitary condition, suitable painted building containing adequate sanitary accommodation for all workmen in accordance with local Municipal and Provincial sanitary regulations, and to the approval of Public Health Authorities and the Consultant, with all necessary water, sewage, light and heat supplied in sufficient quantity. The use of single portable serviced units will be permitted providing siting is approved.

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

END OF SECTION

PART 1 - GENERAL

1.1 SITE ENCLOSURE

.1 Install temporary fencing at start of mobilization to fully secure site. Work must be undertaken outside of regular school hours. No construction work or excavation work may be undertaken on an unsecured site.

.2 Enclose site to conform with current legislation and safety standards. Provide temporary 1.8m high galvanized chainlink fencing around entire construction site, complete with gates as required for site access. Fencing shall remain throughout construction period and until all construction debris has been removed from site. Gates shall be locked when no work is in progress.

.3 For temporary fencing all posts, other than gate posts, shall be driven in minimum 1.5m, at maximum 3048mm spacing. Gate posts shall be set in concrete. Secure temporary fencing to new fences where they meet.

.4 Erect enclosure so as to provide a secure compound for construction equipment & supplies. Hold the Owner harmless from any damage or expense arising from failure to properly execute such work.

.5 Provide, erect, and maintain hoarding for construction as required for safety or as otherwise agreed to with the Consultant, or as directed by Authorities Having Jurisdiction. Confirm that hoarding is designed to resist wind loads.

.6 Gates to be kept locked except during working hours.

.7 Maintain hoarding during the period of the Contract.

.8 Should the project be stopped for any reason, provide and maintain all necessary fencing and protection to protect building & site from damage.

.9 On completion of the contract, take down and remove hoarding and gates from the site as well as the protective enclosures at the drip line of all trees that are to remain.

1.2 DRAINAGE

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

.2 Pumping of water containing silt in suspension into waterways, sewer or drainage systems is prohibited.

.3 Dispose of water containing silt in suspension in accordance with local authority requirements. Silt fencing is required to contain silt on site.

.4 Take full responsibility for maintenance of existing drainage, above ground and underground, adjacent to the Work or affected by the Work.

.5 Before commencing any Work likely to affect the drainage of water from the Site, provide necessary alternative drainage systems to ensure that water will be conducted to alternative outlets. Do not block or impede any drain, roof outlet or rainwater leader until such safety precautions have been made.

1.3 **SILT CONTROL**

.1 Provide silt control to prevent silt migration into water courses, municipal storm sewers and adjacent properties, as indicated on drawings and in accordance with Ontario Provincial Standards OPSS 805, Construction Specification for Temporary Erosion and Sediment Control Measures, and OPSD 219.130, Heavy-Duty Silt Fence Barrier.

.2 Provide silt controls at existing manholes and catch basins; refer to details on drawings.

.3 Provide, install, and maintain any additional silt fencing required by the Municipality to control run off from site.

.4 Arrange for inspection of siltation controls by Authorities Having Jurisdiction. Make any adjustments or repairs as required by the inspector for their approval.

.5 Maintain all silt controls throughout the construction period, to prevent silt migration into water courses, municipal storm sewers and adjacent properties.

1.4 **TREE PROTECTION**

.1 Protect all existing trees from damage during the construction period. Protection to be in accordance with municipal standards and approvals.

.2 Confine movement of heavy equipment, storage of same, and storage of materials to a predetermined area. Do not store materials or place equipment over root systems of any existing trees.

.3 No rigging cables shall be wrapped around or installed in trees. Do not flush concrete trucks or cement mixing machines over root systems or near trees. Flush concrete trucks or cement mixing machines in areas approved by Consultant.

.4 Protect plant and root systems from damage, compaction and contamination resulting from construction by erecting hoarding fence at the dripline of existing vegetation to be preserved to the satisfaction of Consultant.

.5 Where root systems of trees are exposed directly adjacent to a structure backfill with good loam only.

.6 If any existing tree to remain is injured and does not survive the following year, replace with a tree of similar size and value, as directed by the Consultant, at no additional cost to Owner.

.7 Should the destroyed tree be of such a size or shape that it cannot be feasibly replaced, then the Contractor shall compensate the owner for the minimum sum of one thousand dollars ($1,000.00) per destroyed tree.

.8 Provide and Install:
- .1 Posts: metal 38x25x2000mm length, t-bars and 100x100 wood posts.
- .2 Hoarding: 1200mm high, galvanized welded wire fencing, 9 gauge wire.
- .3 Rails: 38x90x1500mm length, pressure treated spruce.

.9 Identify plants, condition of plants, and limits of root systems to be preserved to satisfaction of Landscape Architect. Report any discrepancy in plant condition and preservation status prior to any removal.

.10 Install hoarding in conformity with details, including 2000 mm length metal T-bars at 2400mm on centre, 100 dia corner posts, 38 x 90 top rail and braces. Attach fence to frame and fasten with wire fasteners.

.11 From time of acceptance by Consultant to end of warranty period, perform following maintenance operations:

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

.2 Apply biological controls in accordance with Federal, Provincial and Municipal regulations as and when required to control insects, fungus and disease. Obtain project approval from Consultant prior to application.

.3 Apply organic urea fertilizer in early spring at suppliers suggested rate.

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

.5 Submit monthly written reports to Consultant identifying:
- .1 Maintenance work carried out
- .2 Development and condition of plant material
- .3 Preventative or corrective measures required which are outside Contractor's responsibility

.6 Prune crown to compensate for root loss while maintaining general form and character of plant.

1.5 SITE PROTECTION

.1 Supply, install and maintain all guard rails, barriers, night lights, sidewalk and curb protection as may be necessary or as the by-law may require.

.2 Supply, install and maintain all necessary temporary doors, screens and coverings to protect work areas. All such work shall be neatly painted. Doors shall have hasp and substantial padlock. Owners representative shall have key or combination where access is required. Provide and maintain temporary fencing at excavations, etc. as required for safety. Protect existing asphalt and concrete paving and curbs from damage and make good any damage at completion of project.

.3 Protect footings, masonry, mortar, concrete, and all frost susceptible materials from cold weather and rain. Protect all of the work from damage by the elements.

.4 Properly protect floors and roofs from any damage. Take special precautions when moving heavy loads or equipment over floors and roofs.

.5 Keep floors free of oils, grease or other such materials likely to discolour them and/or affect bonding of applied surfaces.

.6 Ensure that no part of the Work is loaded greater than it was designed for, when completed. Make any temporary support as strong as the permanent support. Place no load on concrete structure until it has sufficient strength to safely bear such load.

.7 Protect glass and other finishes against heat, slab and weld splatters, using appropriate protective shields and covers.

.8 Provide and maintain, in good working order, appropriately labelled ULC fire extinguishers, to the approval of Authorities Having Jurisdiction.

.9 Provide a minimum of two safety helmets and two safety vests on site at all times for the use of any other Owner authorized visitors to the site. It is the Contractor's responsibility to make certain that any such visitors wear the protective headgear and any other safety gear which may be necessary at that particular time of construction.

.10 Should the job be stopped for any cause, the Contractor shall be responsible for and provide all necessary protection to prevent damage by weather or other cause until the cause of stoppage has been cleared.

.11 The Contractor shall be entirely responsible for supervision of project and for protection of public from vehicles in movement, stockpiled materials and construction.

.12 The Contractor is responsible for the prevention of vandalism and theft of all tools, equipment and materials.

.13 Any damage to roadways must be repaired immediately, to municipal standards.

.14 The Contractor is responsible for snow removal on sidewalks adjacent to work areas and all are as required for access to site.

.15 Any damage to site by the Contractors forces, delivery vehicles, etc., must be made good at the end of the job. Similarly any damage to curbs, sidewalks, or other municipal property shall be made good by the Contractor.

1.6 **TEMPORARY DRIVEWAY ACCESS**

.1 Ensure continuous access to all existing driveways from municipal and regional roads. Provide steel plates as required to bridge all excavations, trenches, and other site disturbances at driveway locations. All work to be coordinated with property owners and building occupants.

.2 All work to conform to municipal and regional standards.

1.7 **SECURITY**

.1 The Contractor shall be entirely responsible for supervision of project and for protection of public from vehicles in movement, for stockpiled materials and construction. Vehicular parking and stockpile materials must be maintained on the construction site only. No street parking or stockpiling will be allowed on the Municipal streets.

.2 The Contractor is responsible for the prevention of vandalism and theft of all tools, equipment and materials until date of Substantial Performance of Contract.

.3 The Contractor shall provide 24 hour surveillance on site from date of Substantial Performance to date of acceptance and occupancy by the Owner.

1.8 **PROTECTION OF SODDED AREAS**

.1 Protect all new sodded areas with warning signs and temporary fencing for full duration of grow-in period, until acceptance.

.2 Provide 1200mm high chainlink fence to completely enclose all newly sodded areas. Plastic snow fence will *not* be accepted.

.3 If sod is not established and accepted by the Consultant before the end of the growing season, then the fencing shall remain in place over the winter and for a minimum of 30 days after the start of the next growing season, and until acceptance of the sodded areas. Refer to Section 32 92 23, Sodding, for requirements for acceptance.

1.9 **REMOVAL OF TEMPORARY BARRIERS**

.1 Remove temporary barriers and enclosures from site when directed by Consultant and/or at the completion of the project.

.2 Remove temporary enclosure around newly sodded areas once sod is fully established and/or when instructed to do so by the Owner.

END OF SECTION

PART 1 - GENERAL

1.1 PRECONSTRUCTION SURVEY

.1 Prior to commencement of any work on site, Contractor shall engage an Ontario Land Surveyor to prepare a preconstruction survey with the same level of detail as provided for in the survey issued as Supplementary Information with the tender documents.

.2 Contractor shall also include the costs to reinstate all iron bars.

.3 Submit four copies of the completed, sealed survey to the Consultant.

.4 Following the completion of this survey the Contractor shall issue a letter, addressed to the Owner and copied to the Consultant, accepting conformity of the site with the Survey issued as supplementary information at the time of Tender.

1.2 LAYOUT OF BUILDING

.1 Stake out accurately all principal corners of the work, using the services of an Ontario Land Surveyor. Check lot lines and ensure that the building lines bear the exact location to the lot lines as shown on drawings. Confirmation of property lines is to be in accordance with the original survey and the preconstruction survey. Measure existing building as necessary to confirm dimensions for addition and renovations.

.2 Obtain, and pay for, an erosion and sediment control permit as required by the Municipality. This must be done before the building permit will be issued.

.3 At the time of mobilization or immediately thereafter, the Contractor is to confirm in writing that all required property bars are identified and that the site is visually in general conformance with the description in the documents.

.4 Report any dimensional discrepancies immediately to the Consultant, and confirm as soon as possible any job measurements required for shop drawings, etc. Co-ordinate all trades, including mechanical and electrical.

.5 When foundations are in place, prepare and submit 4 copies of a survey, prepared and sealed by an Ontario Land Surveyor, showing the exact location of all perimeter foundations in relation to boundaries and existing building and noting all discrepancies from drawings. Survey must also be updated to show actual finished floor elevations in relation to Municipal Datum Point, as well as location and elevations of all new curbs, catchbasins, manholes (top and invert), etc.

1.3 TOPOGRAPHIC SURVEY

.1 Upon completion of site work (before sod application) and prior to application for Substantial Performance, submit to the Consultant six (6) copies of the same site plan submitted after completion of foundations work but supplemented to show outline of paved areas, final finished grades of all altered areas of site, new manhole/catchbasin elevations, and location of new buried services.

1.4 **DIMENSIONS**

.1 Ensure that necessary job dimensions are taken and trades are co-ordinated for the proper execution of the work. Assume complete responsibility for the accuracy and completeness of dimensions and for all co-ordination.

.2 Verify that work is executed in accordance with dimensions indicated, that levels and clearances are maintained, and that work installed in error is rectified before construction continues.

.3 Check and verify all dimensions including interfacing of services. Dimensions, when pertaining to the work of other trades, shall be verified with the trade concerned. Ensure that all Subcontractors co-operate for the proper performance of the work.

.4 Do not scale directly from the drawings; this applies all drawings, whether in paper or digital format. If there is ambiguity or lack of information, immediately inform the Consultant. Any change caused by lack of such review shall be the responsibility of the trade concerned.

1.5 **SITE VERIFICATION**

.1 Include cost for underground service locates at all exterior site work locations. Modify layout of new work to suit (in consultation with Consultant).

.2 Include cost to survey site work to confirm final layout and grades.

END OF SECTION

PART 1 - GENERAL

1.1 CUTTING AND PATCHING

.1 Before cutting, drilling or sleeving elements, obtain approval of location and method.

.2 Do not endanger work or property by cutting, digging, or similar activities. No trade shall cut or alter the work of another trade who has installed it unless approved by that trade.

.3 Cut and drill with true smooth edge to minimum suitable tolerances.

.4 Replace and/or make good damaged work.

.5 Patching or replacement of damaged work shall be done by the subcontractor under whose work it was originally executed, and at the expense of the subcontractor who caused the damage.

END OF SECTION

PART 1 - GENERAL

1.1 GENERAL

.1 Conduct cleaning and disposal operations to comply with local ordinances, anti-pollution laws, and recommendations of Construction Safety Association.

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

.3 Prevent accumulation of wastes which create hazardous conditions.

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

.5 Provide instructions designating proper methods and materials to be used in final cleaning of Work.

.6 Do not bury or burn any rubble, waste or packaging, or surplus materials. No dumping of waste, such as oil or paint, into sewers will be permitted.

.7 Dispose of waste materials in accordance with the Environmental Protection Act, R.S.O. 1990, C. E.19, and regulations under the Act, including:

- .1 O.Reg. 102/94 Waste Audits and Waste Reduction Work Plans
- .2 O.Reg. 103/94 Industrial, Commercial and Institutional Source Separation Programs
- .3 R.R.O. 1990, Reg. 347: General - Waste Management

1.2 MATERIALS

.1 Use only cleaning materials recommended by manufacturer of surface to be cleaned, and as recommended by cleaning material manufacturer.

1.3 POLLUTION CONTROL

.1 Cover or wet down dry materials and rubbish to prevent blowing dust and debris. Provide dust control for temporary roads. Remove mud deposited on public roads. Provide mud mats at all site access roads.

.2 Prevent dust nuisance to adjacent properties, existing school, and general public by taking appropriate pollution control measures as directed by Consultant.

.3 Include daily watering of site to maintain dust control as part of tender submission.

1.4 DISPOSAL OF WASTES

.1 Burying of rubbish and waste materials on Site not permitted.

.2 Disposal of waste or volatile materials, such as mineral spirits oil or paint thinner into storm or sanitary sewers prohibited.

.3 Meet Ministry of the Environment Standards and Guidelines.

1.5 **FIRES**

.1 Fires and burning of rubbish on Site is not permitted.

1.6 **CLEANING DURING CONSTRUCTION**

.1 Maintain entire site and adjoining municipal and/or private property free from accumulations of waste materials and rubbish. Do not allow rubbish to accumulate in work under construction or on roofs. Clean site daily.

.2 Provide on-site containers for collection of waste materials, and rubbish. Empty containers on a regular basis in conformance with Municipal and Provincial Regulations.

.3 Cleaning operations shall include those areas used for temporary site access or used on a temporary basis to facilitate the Work.

END OF SECTION

PART 1 - GENERAL

1.1 TAKEOVER PROCEDURE

.1 Subject to detailed instructions included in these specifications, conform to OAA/OGCA document 100, Take-Over Procedures, current edition.

1.2 ACTION REQUIRED AT OCCUPANCY

.1 When of the opinion that the Occupancy Requirements have been met, perform an inspection of the work, accompanied by the major subcontractors. Submit an inspection report, confirming that the occupancy requirements have been met, to the Consultant and the Owner.

.2 Arrange for a review of the Work with the Consultants and Owner. The Consultant will determine whether the Work is Fit for Occupancy.

.3 Request letters confirming General Review from Consultant.

1.3 ACTION REQUIRED AT SUBSTANTIAL PERFORMANCE

.1 Perform the actions listed below prior to issue of the Certificate of Substantial Performance of the Contract.

.2 Submit the documents and material detailed in section 01 78 00, Closeout Submittals. Deliver all required submittals to the Consultant for approval PRIOR to Substantial Performance of the Work. Final payment will not be made until all these items have been received and approved.

.3 Prior to applying for a Certificate of Substantial Performance, perform an inspection in accordance with OAA/OGCA Document 100, Stage 2, Contractor's Inspection for Substantial Performance. Submit a copy of the deficiency list to the Consultant.

.4 Ensure all sub-systems ie fire alarm, security, E.M.S., are fully operational prior to Substantial Performance.

.5 When of the opinion that the requirements for Substantial Performance have been met, submit an application for a Certificate of Substantial Performance to the Consultant. The application shall be as outline for Stage 3 of the OAA/OGCA Take-Over Procedures.

.6 Expedite and complete deficiencies and defects identified by the Consultant. Final Certificate for Payment will not be issued until all deficiencies are satisfactorily corrected, inspected, and approved by the Consultant, and all documentation has been handed to the Consultant.

.7 Remove all protection erected, and make good all damage to the Work and adjoining Work due to the lack or failure of such protection. In addition, all debris, surplus materials tools equipment shall be removed from the work areas and the site, and the Project shall be left clean and tidy to the full and complete satisfaction of the Consultant and Owner.

.8 Perform final adjustment of Cash Allowance, specified in Section 01 10 00, General Instructions.

.9 Arrange for Consultant to prepare CAD drawing files for the Board using the final as-built drawings.

.10 At time of Substantial Performance, instruct the Owner's personnel in operation, adjustment and maintenance of equipment and systems, using operation and maintenance manuals as the basis for instruction.

.11 Prior to final site review, start up and demonstrate operation of all systems to the Owner and the Consultant.

.12 Review cash and contingency allowances in relation to contract price, change orders, hold-backs and other contract price adjustments.

.13 Review inspection and testing reports to verify conformance to the intent of the documents.

.14 Review condition of all equipment, which has been used in the course of the Work to ensure turnover at completion in "as new condition" with warranties, dated and certified from time of Substantial Performance of the Contract.

.15 Provide on-going review, inspection, and attendance to building call back, maintenance and repair problems during the warranty periods.

.16 Continue to submit monthly deficiency status reports, as specified in Section 01 32 00, Construction Progress Documentation.

1.4 **TOTAL PERFORMANCE**

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

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

.3 Letter of Completion:

.1 Submit a Letter of Completion to the Consultant stating that the Contract is complete, that all deficiencies identified by the Consultant, Subconsultants, Inspectors and Owner have been rectified, and requesting final reviews by Consultant and Subconsultants.

.2 Sign and return deficiency lists, issued by Consultant and Subconsultants, to confirm completion of all deficiencies identified thereon.

.4 Final Site Review:

.1 Consultant will conduct one site review for Total Performance, within ten (10) working days of the request by the Contractor. Should the Contractor fail to provide the Letter of Completion, the Consultants will be under no obligation to perform a site review within the above noted time.

.2 Additional site reviews, as requested by the Contractor or as necessitated due to the Contractor's failure to complete work as required, shall be paid for by the Contractor at a rate of $500 per visit, per consultant, plus the cost to prepare additional site review reports at per diem rates (rates as recommended by the OAA or PEO, or as negotiated in advance).

.5 Submit a final request for payment, incorporating all approved changes to the Contract price, and adjustments to the Cash Allowance.

.6 Final Certificate for Payment will not be authorized until all deficiencies are satisfactorily corrected, reviewed and signed off by the Consultant, and required submittals have been completely and accurately provided.

1.5 **WARRANTY PERIOD**

.1 The Warranty Period on this Project will expire **twelve (12) months** from the date of Substantial Performance of the Work, except for extended warranties as called for throughout the Specifications or equipment not certified by Consultant at time of Substantial Performance.

END OF SECTION

PART 1 - GENERAL

1.1 SUBMITTALS REQUIRED FOR OCCUPANCY

.1 Refer to Section 01 41 00, Regulatory Requirements for documents required to be submitted to Authorities having Jurisdiction, for occupancy.

1.2 SUBMITTALS REQUIRED AT SUBSTANTIAL PERFORMANCE

.1 Prior to Substantial Performance of the Contract, perform the actions detailed in section 01 77 00, Closeout Procedures, and submit the following documents and materials:

.1 Deficiency list prepared by Contractor for both interior and exterior areas of the project.

.2 Certificates of good standing from the Workplace Safety & Insurance Board for the Contractor and all Subcontractors

.3 Operations and Maintenance Manuals, including warranties. If manuals are unavailable, the designated value of the submittals will be retained in the Contract; see below.

.4 One complete set of final approved Shop Drawings (bound separately) indicating corrections and changes made during fabrication and installation

.5 As-Built Documents as specified in Section 01 33 00, Submittal Procedures

.6 As-Built survey on a 10x10m grid indicating all curbs, roadways, walkways, catchbasins, manholes, etc. Survey to be prepared by a Registered OLS.

.2 Deliver all required submittals to the Consultant for approval prior to Substantial Performance of the Work. Final payment will not be made until all these items have been received and approved. These submittals include:

1.3 MAINTENANCE MANUALS

.1 At Substantial Performance, submit to Consultant one hard copy and one digital copy of Architectural, Mechanical, and Electrical Operations Data and Maintenance Manuals made up as follows:

.1 Bind data in vinyl hard covered, three-ring loose leaf binders for 212.5mm x 275mm (8-1/2" x 11") size paper. Digital copy shall be submitted in pdf (portable document format) on a single USB flash drive with label or tag identifying project.

.2 Enclose title sheet, labelled "Operation Data and Maintenance Manual - Architectural", with project name, date, and list of contents. Enclose similar sheet labelled "Operation Data and Maintenance Manual - Mechanical and Electrical" in applicable manuals. Include the following information:

.1 name of project
.2 name of Owner
.3 name of Consultant

.4 name of Contractor
.5 date of Substantial Performance.

.3 Organize contents into applicable sections of work to parallel project specification break-down. Mark each section by labelled tabs protected with celluloid covers fastened to hard paper dividing sheets.

.4 All data related to a section of work or product shall be grouped together, except for shop drawings, unless otherwise requested by the Owner. Confirm method of organization with Owner prior to assembling manuals. Typically, each section shall be organized, as applicable, as follows:
.1 General information; identify section of work, subcontractor(s) responsible
.2 Warranty
.3 Guarantees, Bonds
.4 Schedules (hardware, paint)
.5 Product data sheets
.6 Material safety data sheets (MSDS)
.7 Operating manual
.8 Maintenance instructions
.9 Receipts for maintenance materials, keys, etc.,
.10 Maintenance contracts
.11 Inspection and testing reports

.2 Provide one copy of each of the following in the first binder:

.1 Contractor’s final statutory declaration on CCDC form 9A-2001
.2 Major Subcontractor’s final statutory declarations on CCDC form 9B-2001
.3 Workers' Compensation and Insurance Board (WSIB) certificate
.4 certificates of approval of the work by the Building Department (if available)
.5 Ontario Hydro certificate of inspection.

.3 Also provide, on a disk or memory stick, copies of all construction progress photos submitted; refer to Section 01 32 00. Provide an index with printed images clearly identified with name of project, description of view and date taken. In printed copy of manual, include a printed copy of the index and a disk containing all photos. Disks are to be clearly labelled .

.4 Include the following information, plus any additional data required within the specifications.

.1 List of all Subcontractors, major suppliers, and local equipment service representatives, their addresses and telephone numbers.

.2 Date of Substantial Performance (commencement of warranty periods) and termination dates of warranties.

.3 Operating manuals including lubricating, repair and other instructions to keep all mechanical and electrical/electronic equipment in good working order. Reviewed shop drawings of same. Refer to Mechanical and Electrical Specifications for further requirements.

.4 Door and Frame Schedule (as-built); insert in front of Division 08 section in manuals.

.5 Final hardware schedule, revised to include all changes during construction, including local manufacturer's descriptive and service literature. Include AHC's final inspection report.

.6 Final finish/colour schedule; insert in front of Division 09 section in manuals.

.7 Provide paint schedule indicating paint brand and formulas used.

.8 Maintenance instructions for all types of floor finish and other special finishes. Include instructions for cleaning, repairing, refinishing and freshening, and warnings of damaging or dangerous practices where necessary.

.9 Maintenance and service instructions and manufacturer's literature for all special architectural features: i.e. windows, patent glazing, handicapped lift etc.

.10 Description, operations and maintenance instructions for equipment and systems, including complete list of equipment and parts list.

.11 All warranties, guarantees, bonds, etc., properly completed and signed, which extend beyond the general warranty period, for all work and equipment as specified or as otherwise supplied and installed, from manufacturers and trades. Warranties, guarantees and bonds shall include:

.1 Name and address of project.
.2 Warranty commencement date.
.3 Duration of warranty.
.4 Clear indication of what is being warranted and what remedial action will be taken under warranties.
.5 Signature and seal of Contractor.

.5 List additional material used in project showing name of manufacturer and source of supply.

.6 Manuals must bear seal and signature of Contractor.

.7 Maintenance Manuals must be delivered, complete and in one package, to Consultant. The final Certificate for payment will not be issued until ALL documentation has been received, reviewed, and approved, by Consultant.

1.4 **SHOP DRAWING MANUAL**

.1 Provide one complete set of final approved Shop Drawings, bound separately. Shop drawings shall be the drawings reviewed and stamped by the consultants. Mark-up shop drawings to indicate corrections and changes made during fabrication and installation.

.2 Provide a digital copy of the shop drawing manual, included on the USB flash drive with the digital copy of the maintenance manuals.

1.5 **MAINTENANCE MATERIALS**

.1 Where supply of maintenance materials is specified, deliver items as follows:

.1 Materials in unbroken cartons or, if not supplied in cartons, they shall be strongly packaged.

.2 Clearly mark as to content.

.3 If applicable give colour, room number of area where material used.

.4 Obtain signed receipt from the Owner's designated representative and store in an assigned, lockable room.

.2 Copies of signed receipts for maintenance materials are to be included in the maintenance manuals.

.3 Replacement materials are for the sole use of the Owner and must not be used by Contractor to replace deficient work.

1.6 **AS-BUILT DRAWINGS AND RECORD DOCUMENTS**

.1 Provide As-Built Drawings, as specified in Section 01 33 00, and Record Documents (electronic files).

.2 Prior to the date of Substantial Performance, request updated drawings from the Consultant. Transfer all "as-built" markups from the on-site drawings to these updated drawings and return them to the Consultant for preparation of architectural Record Drawings.

.3 Record documents shall consist of the original documents altered to reflect all changes and information indicated on as-built documents.

.4 The Consultant shall prepare architectural Record documents and be reimbursed for costs by the Contractor through the Cash Allowance included in the Contract.

.5 Refer to Mechanical and Electrical Specification Divisions for specific requirements regarding preparation and submission of final mechanical and electrical Record Drawings.

1.7 **REVIEW OF MANUALS BY CONSULTANT**

.1 Submit all manuals for review by the Consultant.

.2 The Contractor is responsible for confirming the completion of the manuals prior to forwarding to the Consultant for review. If any items are outstanding, provide tabs at the appropriate locations and indicate the nature of the outstanding documents to be inserted.

.3 Do not submit partially complete manuals to the Consultant; only documents which cannot be provided at the time of Substantial Performance are permitted to be flagged for later insertion. The Consultant will review manuals once for completion and will then review only one resubmission. If additional reviews are required, the Contractor will be invoiced for the Consultant's time at a rate of $90/hour.

1.8 **VALUATION OF CLOSEOUT SUBMITTALS**

.1 Due to the high value to the Owner of the closout submittals, including maintenance manuals and submittals required by Authorities Having Jurisdiction, for the purpose of project administration and calculation of Substantial Performance, the Closeout Submittals will be assigned a value of $2,000.00.

.2 The full assigned value of the submittals for each discipline will be held in the Contract until such time as all closeout submittals required for that discipline are delivered to the Consultant and are deemed complete and acceptable by the Consultant and applicable subconsultant.

.3 Architectural record drawings, to be prepared by the Consultant and paid through the Cash Allowance, are not included in the valuation of closeout submittals.

END OF SECTION

PART 1 - GENERAL

1.1 WORK INCLUDED

.1 This Section includes all demolition work and alterations required to accommodate new construction. Work performed under this section shall conform to the specifications for new work, as applicable. Allocation of the Work is the responsibility of the Contractor.

1.2 RELATED WORK

.1	Hazardous Materials	Section 01 35 43
.2	Temporary Barriers and Controls	Section 01 56 00
.3	Execution	Section 01 73 00
.4	Cast-in-place concrete	Section 03 30 00
.5	Site Clearing	Section 31 10 00
.6	Grading	Section 31 22 00

1.3 REFERENCES

.1 Conform to all laws, By-Laws and regulations of the authorities having jurisdiction and, in particular, the Ontario Occupational Health and Safety Act; The Environmental Protection Act; The Ontario Building Code, (Ontario Reg. 332/12); The Ontario Fire Code; The National Building Code, 2010; and the National Fire Code. Refer to current editions of all standards.

.2 CSA S350-M, code of practice for safety in demolition of structures.

.3 Environmental Protection Act, R.S.O. 1990, C. E.19, and regulations under the Act, including:
- .1 O.Reg. 102/94 Waste Audits and Waste Reduction Work Plans
- .2 O. Reg. 103/94: Industrial, Commercial And Institutional Source Separation Programs
- .3 R.R.O. 1990, Reg. 347: General - Waste Management

.4 Occupational Health and Safety Act, and regulations under the Act, including:
- .1 O.Reg. 213/91 Construction Projects
- .2 O.Reg. 278/05, Designated Substance - Asbestos on Construction Projects and in Buildings and Repair Operations amended 479/10.
- .3 O.Reg. 860/90 Workplace Hazardous Materials Information System (WHMIS)
- .4 All regulations regarding "Designated Substances"

.5 Regulations for the transport of asbestos waste, including:
- .1 Transportation of Dangerous Goods Act, 1992 (1992, c. 34)
- .2 Dangerous Goods Transportation Act, R.S.O. 1990, c. D.1

.6 Resilient Floor Covering Institute (RFCI)
- .1 Recommended Work Practices for Removal of Resilient Floor Coverings.

1.4 EXAMINATION OF EXISTING SITE AND STRUCTURE

.1 Examine the existing site and building before tendering to be familiar with the detailed extent of demolition, dismantling, relocation and reassembly required.

.2 Copies of the original working drawings for the construction of the building are available in digital format. Note that existing, as-built, conditions may vary from the conditions depicted on the original drawings.

.3 Refer to Section 01 35 43, Hazardous Materials, for information on hazardous materials which may be present in the existing building.

.4 No allowance will be made for failure to obtain complete information prior to close of tenders.

1.5 **SUMMARY OF WORK**

.1 Demolition and removal of existing building areas indicated on drawings, including all finishes and materials, and as required to facilitate the renovation of new Kindergarten play area. All removed materials shall become property of the Contractor and shall be removed from the site.

.2 Carry out all alteration and demolition work required to accommodate new work indicated on drawings. Make good any damage caused by alterations required.

.3 Repair or replace existing damaged surfaces scheduled to be repainted. Finished surfaces to be ready for finish painting.

.4 Unless noted otherwise, building materials resulting from demolition under this contract shall become the property of the Contractor, and shall be removed by the Contractor.

.5 Remove, transport, and dispose of hazardous materials in accordance with applicable laws.

.6 Refer also to Section 01 73 00, Execution, for additional requirements for alterations and accommodations for new work.

1.6 **PROTECTION**

.1 Erect fencing, as specified, interior barriers, notice and warning boards and maintain all protection of all kinds for the protection of the workmen on the work, for the protection of adjoining property and for protection of public.

.2 Protect all existing paving and site amenities not designated for removal. Make good damage to the approval of the Consultant.

.3 Prevent movement, settlement, and damage to existing building to remain, services, paving, landscaped areas to remain, and adjacent structures. Provide temporary supports, including shoring and bracing, as required. All shoring must be designed by a professional engineer licenced in the Province of Ontario.

.4 Protect adjacent properties against damage which might occur from falling debris or other cause. Make good damage to adjacent public or private properties resulting from Work of this Contract.

.5 Protect existing building from damage and contamination during demolition activities. All openings must be made weatherproof. Provide temporary barriers, dust control measures, security controls, supports, and such additional protection as may be required by specific demolition work. Cover existing windows, doors, louvres, etc., opening to construction areas with minimum 16mm Type X gypsum board on steel stud framing to prevent exposure to construction activities.

1.7 **SCHEDULE OF WORK**

.1 Student safety and required exiting from the existing school must be maintained at all times, particularly during the school's operating hours and scheduled events. Work must be suspended if the Principal advises that noise and/or dust is interfering with the school program.

.2 Construction fence must be installed and construction area secured before any work is undertaken. Enclosure must conform to Ministry of Labour and Municipal requirements as well as these specifications.

.3 Dust proofing measures must be installed prior to any work being undertaken.

1.8 **SERVICES**

.1 Seal and cap mechanical / electrical services in order to facilitate removals indicated on drawings. Mark location and type of service of all capped services at the site. Submit record drawing showing locations and dimensions of all capped services.

PART 2 - PRODUCTS

2.1 Not Used

PART 3 - EXECUTION

3.1 **DEMOLITION**

.1 Refer to drawings for demolition drawings and notes.

.2 Any items noted to be re-used or re-located are to be removed carefully, packaged appropriately, and handed over to Contractor.

.3 At the end of each day's work, leave work in a safe condition so that no part of the remaining structure is in danger of collapse.

.4 Do not burn any refuse or debris at the site.

.5 Remove all necessary trees, shrubs and all stumps, brush and perishable matter. Tree stumps shall be removed sufficiently so that they may not constitute a later obstruction to services and underground work and may not cause settlement of paved areas. Refer also to section 31 10 00, Site Clearing.

3.2 **REMOVAL OF EXTERIOR WALKS AND PAVEMENTS**

.1 Coordinate with forces installing new asphalt and concrete paving, to ensure new work is performed promptly after removals are completed.

.2 Remove existing asphalt paving, concrete sidewalks, concrete curbs and concrete pads, etc, as indicated on drawings and as required to accommodate new construction. Remove complete asphalt and concrete paving structures, including base and sub-base.

.3 Granular base materials may NOT be reused.

.4 Dispose of removed materials off site.

3.3 **COMPLETION OF WORK**

.1 Remove all surplus materials, equipment and rubbish from the site.

.2 Leave site in condition to meet approval of the Consultant.

.3 On completion of Demolition work, thoroughly clean all existing surfaces to remain, including ceiling space. No debris or dirt shall remain to be enclosed by new construction.

END OF SECTION

PART 1 - GENERAL

1.1 WORK INCLUDED

.1 All cast-in-place concrete including supply, placing, finishing and curing at footings and bases.

1.2 REFERENCES

.1 ASTM C260, Standard Specification for Air-Entraining Admixtures to Concrete.

.2 ASTM C309, Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete.

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

.4 ASTM D1751, Standard Specification for Preformed Expansion Joint Fillers for Concrete Paving and Structural Construction (Non-extruding and Resilient Bituminous Types).

.5 ASTM E 1745-09 Standard Specification for Plastic Water Vapor Retarders Used in Contact with Soil or Granular Fill under Concrete Slabs.

.6 ASTM E 1643-11 Standard Practice for Selection, Design, Installation, and Inspection of Water Vapor Retarders Used in Contact with Earth or Granular Fill Under Concrete Slabs

.7 CSA A5, ASTM C150 Standard Specification for Portland Cement.

.8 CSA-A23.1, Concrete Materials and Methods of Concrete Construction.

.9 CSA-A23.2, Methods of Test and Standard Practices for Concrete.

.10 CAN/CSA A3000, Cementitious Materials for Use in Concrete.

.11 CAN/CSA S448.1, Repair of Reinforced Concrete in Buildings.

.12 CSA A283, Qualification Code for Concrete Testing Laboratories

1.3 QUALITY ASSURANCE

.1 Concrete supplier to have a valid “Certificate of Ready Mixed Concrete Production Facilities” as issued by the Ready Mixed Concrete Association of Ontario.

1.4 PROJECT RECORDS

.1 Batch Logs: Concrete supplier to keep record of each batch delivered to site.

.2 Concrete Delivery Slips: Keep all concrete delivery slips (“driver’s tickets”) on site until building is completed. Record on delivery slip where concrete was placed including time and date.

.3 Record Drawings: Record on a set of Structural Drawings extent of each pour including pour date and falsework removal date. Also record all changes to that shown on drawings including footing elevations.

.4 Keep project records up to date and make available to Consultant at all times.

1.5 **SUBMITTALS**

.1 Submit to the Consultant for review before the start of Work, 4 white prints of shop drawings. Leave room on drawings for the stamps of the Consultant and the Structural Engineer. Check and sign before submission. Only 2 copies will be returned to General Contractor.

.2 Minimum 2 weeks prior to starting concrete work, submit certification that plant, equipment, and materials to be used in concrete comply with requirements of CSA-A23.1.

.3 Minimum 2 weeks prior to starting concrete work, submit all concrete mix designs, including pump mixes, and indicate where each concrete mix is to be used. Where Class C1, C2 or F1 mix designs are required, submit test data to confirm that air-void system conforms to CSA A23.1 for each mix design.

.4 Minimum 2 weeks prior to starting concrete work, submit a written confirmation that all admixtures used in concrete will not have any adverse impact on the long term durability and performance of concrete, or any other materials embedded or in contact with concrete. Also provide a written statement that any admixtures used in concrete will not have any adverse effect on human health and the environment.

.5 Minimum submission requirements for each concrete mix design shall include the following:

.1 minimum specified compressive strength at 28 days
.2 maximum aggregate size
.3 aggregate type (if not normal density)
.4 alkali-aggregate resistance
.5 concrete density range, wet and dry (if not normal density)
.6 CSA exposure class
.7 cement type (if not type 10)
.8 maximum water/cement ratio
.9 plastic air content range air-void system test data
.10 assumed method of placement of concrete
.11 slump range
.12 percentage and type of any supplementary cementing materials
.13 admixtures (type and name only)
.14 certificate of compatibility between admixtures unless all admixtures are supplied by same manufacturer

.6 Minimum 2 weeks prior to starting concrete work, submit proposed quality control procedures for Consultant's approval for following items:

.1 Finishing, curing and protection
.2 Hot weather concreting
.3 Cold weather concreting

.4 Minimum 4 weeks prior to placing any slabs-on-grade, submit drawings showing proposed locations of construction joints and control joints in slabs-on-grade.

1.6 **WARRANTY**

.1 Provide manufacturer's 10 year warranty for moisture vapour reduction admixture placed in interior slab–on-grade. Warranty shall cover repair or removal of failed flooring system, including application of a moisture remediation coating system on concrete subfloor, and supply and installation of new flooring to match existing. Warranty shall commence at the date of Substantial Performance of the Contract.

PART 2 MATERIAL

2.1 **CONCRETE MIX MATERIALS**

.1 Portland cement: to CSA-A5.

.2 Cementitious hydraulic slag: to CSA-A363.

.3 Flyash: to CSA-A23.5, Type CI.

.4 Water: to CAN/CSA-A23.1.

.5 Aggregates: to CSA-A23.1. Coarse aggregates to be crushed stone or gravel which is suitable for type N concrete as defined by Supplementary Guidelines to OBC 2008, SG-2, . Do not use recycled concrete as aggregate.

.6 To ensure compatibility, all admixtures to be supplied by a single manufacturer or certificate of compatibility to be provided with mix design.

.7 Air entraining admixture: to ASTM C260.

.8 Chemical admixtures: to ASTM C494. Do not use admixtures containing chlorides.

.9 Corrosion inhibiting admixture: Containing calcium nitrite:
.1 DCI by W.R. Grace (use DCI-S with ambient temperatures above 20°C)
.2 Rheocrete CNI by Master Builders (add set retarder with ambient temperatures above 20°C).

.10 Shrinkage reducing admixture: Eclipse Floor for non-air entrained concrete and Eclipse Plus for air entrained concrete by W.R. Grace. Confirm compatibility with superplasticizer if being used.

.11 Moisture Vapour Reduction Admixture (MVRA):

.1 Non-toxic, liquid admixture reacting chemically with concrete to eliminate moisture vapour emission and form a permanent barrier (capillary break) integral to the concrete.
.2 MRVA to be Vapor Lock 20/20 as manufactured by Speciality Products Group, Barrier One MVRA, or Concure Systems MVRA, subject to conformance with these specifications.

2.2 **OTHER MATERIALS**

.1 Grout: Premixed, non-metallic, non-shrink:
- .1 Euco NS Grout by Euclid Admixture Canada
- .2 Masterflow 713 by Chemrex (M.B.T.)
- .3 V-3 Grout by W.R. Meadows of Canada
- .4 Sikagrout 212 by Sika Canada
- .5 M-Bed Standard by Sika Canada
- .6 CPD Non-Shrink Grout by CPD

.2 Dry pack grout: Use 1:2 mix of Portland cement and concrete sand. Add sufficient water for the mixture to retain its shape when made into a ball by hand. When thickness of grout exceeds 50mm, use 1:1½:2 mix of Portland cement, concrete sand and 10mm pea gravel instead. Compressive strength at 28 days to be 40 MPa.

.3 Liquid curing/sealing compound: to ASTM C309 Type 1, Class B, water based acrylic, compatible with surface hardener where hardener is used:
- .1 Sealtight CS 309 by W.R. Meadows of Canada. Apply two (2) coats where exposed concrete floor is called for in Room Finishing Schedule. Apply first coat as soon as concrete sets - Apply second coat just prior to occupancy by Owner.

.4 Premoulded joint fillers: Bituminous impregnated fibre board: to ASTM D1751.

.5 Evaporation reducer: Confilm by Chemrex (M.B.T.)

.6 Bonding agent: synthetic latex :
- .1 Surfacrete Concentrate by Sika Canada
- .2 Intralok by W.R. Meadows of Canada
- .3 Acryl-Set by Chemrex (M.B.T.)
- .4 CPD Concentrated Latex Adhesive by CPD

.7 Drilled concrete expansion anchors:
- .1 Kwik-Bolt by Hilti
- .2 Wedge Anchor by Ucan Fastening Products

.8 Drilled concrete adhesive anchors:
- .1 HVA Adhesive Anchor by Hilti
- .2 ADH Adhesive Anchor by Ucan Fastening Products

.9 Epoxy for bonding anchors and dowels into predrilled holes in concrete:
- .1 HIT-HY-200-R.V3 by Hilti
- .2 Epcon Ceramic 6 by ITW Construction Products
- .3 Flo-Rok FR1-22 & FR3-22 by Ucan Fastening Products

.10 Vapour barrier: Refer to Section 07 26 16

.11 Rigid insulation: Extruded polystyrene boards: Refer to Section 07 21 13 for perimeter insulation and insulation below slabs.
- .1 Styrofoam SM by Dow Chemical
- .2 Styrofoam HI-100 by Dow Chemical

.12 Control joint filler: semi-rigid filler to protect against slab edge breakdown:
- .1 For sawcuts and joints in interior slabs:
  - .1 Rezi-Weld Flex by W. R. Meadows
  - .2 Loadflex by Sika Canada
- .2 For sawcuts and joints in exterior slabs:
  - .1 Sikaflex 2C NS/SL by Sika Canada

.13 Base under concrete Slabs on Grade: Clean, crushed stone, 20 to 22mm.

2.3 CONCRETE MIXES

.1 Use ready-mix concrete. Proportion concrete in accordance with CSA A23.1. Use a water-reducing agent in all concrete except where MVRA admixture is required. Obtain approval of the Consultant for the use of admixtures other than water-reducing and air entraining agents. Add moisture vapour reduction admixture (MVRA) in accordance with manufacturer's recommendations to all ready mix concrete to be placed in interior slab on grade.
Do not add plastic fiber to concrete containing MVRA.

.2 Supplementary cementing materials: Conform to the directions of the slag and fly ash manufacturers for the proportioning and mixing of concrete. Except as otherwise required, limit supplementary cementing materials to no more than 25% of total cementitious content and limit the fly ash component to no more than 10% of total cementitious content. The limit on supplementary cementing materials may be increased for Class N exposure concrete provided that the effects of the resulting concrete properties, including finishing, rate of early-age strength gain, curing and protection, are considered by the Contractor and a letter describing these effects and any special construction procedures is submitted for review with the mix design. Do not use supplementary cementing materials in architectural concrete.

.3 For columns less than 300mm in least dimension and for walls less than 200mm thick, reduce nominal size of coarse aggregate to 10mm.

.4 Exterior unreinforced slabs, driveways, sidewalks, curbs and gutters, parking slabs on grade: Provide normal density, chloride resistant concrete to give following properties:

- .1 Class of exposure: C-2
- .2 Cement: Type 10
- .3 Minimum compressive strength at 28 days: 32 MPa
- .4 Maximum water/cementing material ratio: 0.45
- .5 Nominal maximum size of coarse aggregate: 20mm
- .6 Slump at time and point of discharge: 50mm to 110mm
- .7 Air content: 5 to 8%

.5 Exterior, unreinforced pavements: Provide normal density concrete to give following properties:

- .1 Class of exposure: C-2
- .2 Cement: Type 10
- .3 Minimum compressive strength at 28 days: 32 MPa
- .4 Maximum water/cementing material ratio: 0.45
- .5 Nominal maximum size of coarse aggregate: 20mm

.6 Slump at time and point of discharge: 40mm to 80mm. Use plasticizer if necessary to increase slump for placement.

.7 Air content: 5 to 8%

PART 3 - EXECUTION

3.1 CONSTRUCTION REVIEW

.1 Construction reviews are undertaken by the Consultant and the Inspection and Testing Agency so that the Owner may be informed in writing as to the quality of the Contractor's performance and for the protection of the Owner. They will be carried out by examination of representative samples of the Work.

.2 The Contractor will receive copies of the construction review reports and the results of material tests. He will thereby be informed of any defects or deficiencies found.

.3 Bring to the attention of the Consultant, any defects or deficiencies in the Work, which may occur during construction together with a proposal for remedy. The Consultant will decide what corrective action may be taken and will issue the necessary instructions.

3.2 PREPARATION

.1 Confirm that subgrade and backfill meets specifications and is free of frost and surface water before placing slab-on-grade.

3.3 PLACING CONCRETE

.1 Notify Consultant 48 hours before placing concrete and 24 hours before closing wall forms.

.2 Do cast-in-place concrete work in accordance with CSA-A23.1.

.3 Remove water and disturbed soil from excavations before placing concrete therein.

.4 Do not overload forms.

.5 Use rubber tipped vibrators for concrete containing epoxy coated reinforcement.

.6 The geotechnical/concrete Inspection and Testing agent on site will provide representation for the MVRA manufacturer and must be present at the job site during placement of all MVRA treated concrete. Do not proceed without this representative being present.

3.4 FINISHING FLATWORK

.1 Finish flatwork in accordance with CSA-A23.1, and following clauses.

.2 Protect concrete during finishing process in accordance with CSA-A23.1. Also use evaporation reducer during severe drying conditions.

.3 Cast slabs with a top surface that is level or sloping as required by the Drawings. Allow for cambering where required. Set top of slab below finished floor level by the distance required for the type of applied finish.

.4 Provide final finish in accordance with proposed use and as follows:
- .1 Screeded and bull floated for: mud slabs and footings.
- .2 Screeded and bull floated with scratch finish for: base slabs, which receive mortar setting beds or bonded toppings.
- .3 Powered float finish for: roofs and slabs, which receive a membrane.
- .4 Wood float finish with brooming for: exterior exposed slabs.
- .5 Powered steel trowel finish for: interior exposed slabs; slabs which receive resilient flooring, carpet, epoxy-based finishes, thin-set tiles, etc.

.5 Steel trowel exposed interior concrete floors at least twice. Provide final spin trowelling when non-slip finish is required.

.6 Except as noted, conform to finish tolerance Class A for floors and Class B for exterior slabs and base slabs for toppings. For wood flooring, conform to finish tolerance Class C. Compliance will be considered satisfactory if 80% of the measurements, using the straightedge method, are less than or equal to the tolerance and no measurement exceeds the tolerance by more than 25%. When requested by Consultant, make measurements within 3 days of placing concrete and before falsework is removed and submit results to Consultant.

3.5 CURING AND PROTECTION

.1 Cure and protect concrete in accordance with CSA A23.1. In addition to Cold-Weather Protection requirements in A23.1, provide protection so that temperature of concrete surfaces is maintained at not less than 21 degrees C for 3 days after placement, not less than 10 degrees C for the next 2 days and above freezing for the next 2 days. Vent exhaust gases from combustion type heaters to atmosphere outside heated enclosure.

.2 Cure slab surfaces immediately after finishing is completed. Use a curing compound compatible with applied finishes except where bonded topping to be applied. Where curing compound is not used, cover slab surfaces with absorptive mat or fabric and keep continuously wet. At interior slab on grade (with MVRA), cover slab surfaces with plastic film or waterproof paper per ACI 302.2R for minimum 24 hours.

.3 Extend basic curing period until concrete has reached following strength levels for structural safety:
- .1 Framed slabs and beams: 75% of specified 28 day strength.
- .2 Columns, piers and footings: 75% of specified 28 day strength.
- .3 Walls: 50% of specified 28 day strength.

3.6 FINISHING FORMED SURFACES

.1 Finish formed surfaces in accordance with CSA A23.1. Completely fill holes left by through-bolts with grout.

.2 Do not patch surfaces until instructed in writing by Consultant.

.3 Where honeycombing has occurred cut out in accordance with CSA A23.1. do not patch until reviewed by Consultant.

.4 Provide smooth-form finish for all exposed concrete surfaces.

.5 Provide smooth-rubbed finish to all concrete surfaces exposed to public view. Rub exposed sharp edges of concrete with carborundum to produce 3 mm radius edges unless otherwise indicated.

.6 Provide galvanized finish to all concrete surfaces exposed to public view at the exterior concrete columns at the entrance canopy.

3.7 **INSPECTION AND TESTING**

.1 Inspection and testing of concrete and concrete materials will be carried out in accordance with A23.1 by a Testing Agency designated by Consultant. Testing agency shall be certified under CSA A283 with category to suit testing provided.

.2 Agency will review all submittals pertaining to concrete mix designs and certification of plant, equipment and materials.

.3 Agency will take additional test cylinders during cold weather concreting. Assist Agency by curing these cylinders for 7 days on site adjacent to the work which they represent and under the same conditions as the concrete which they represent.

.4 Samples will be taken prior to the addition of steel fibre reinforcement or superplasticizers to the mix on site.

.5 Methods for testing concrete will be in accordance with CSA-A23.2.

.6 Inspection or testing by Agency will not augment or replace Contractor quality control nor relieve him of his contractual responsibility.

.7 Assist the Agency in its work. Notify Agency as to the concreting schedule and before each pour. Provide concrete samples.

.8 The Agency will report to the Consultant, with copies to the Structural Engineer, Contractor, Concrete Supplier and Municipal Authorities. Reports will include the locations in structure to which tests relate, comments on abnormal results and conditions, and the Supplier’s mix design numbers. Test reports shall be provided within five working days.

3.8 **REJECTED WORK**

.1 Do not deliver to the site materials which are known not to meet the requirement of the Specifications. If rejected after delivery, they shall be immediately removed.

.2 Where review reveals materials or workmanship which appear to have failed to meet the specified quality or tolerances, the Consultant shall have the authority to order additional curing; to have tests made of in-situ concrete, concrete cores, reinforcement or other materials; to order a structural analysis of the existing elements; and to load test the structure. All such work will be carried out in order to assist in determining whether the structure may, in the opinion of the Consultant be accepted, with or without strengthening or modification. Testing shall meet the requirements of the Ontario Building Code. All expenses incurred shall be chargeable to the Contractor regardless of the results.

END OF SECTION

PART 1 - GENERAL

1.1 RELATED WORK

.1	Grading	Section 31 22 00
.2	Excavation and Fill	Section 31 23 00

1.2 SITE CONDITIONS

.1 Establish the location of all utilities and buried objects prior to commencement of any work. Known underground and surface utility lines and buried objects are indicated on the drawings.

.2 Existing Soils:

.1 It is assumed that all soils adjacent to and below asphalt and concrete paving will be contaminated with de-icing salts. Include for disposal at facilities accepting salt contaminated materials.

1.3 PROTECTION

.1 Prevent damage to existing roads, sidewalks, trees, landscaping, natural features, bench marks, and surface or under-ground utility lines which are to remain. Repair any damage.

PART 2 - MATERIALS

2.1 MATERIALS

.1 Obtain Consultants approval of topsoil to be stockpiled. Protect approved material from contamination.

PART 3 - EXECUTION

3.1 CLEARING AND GRUBBING

.1 Clear construction area of all vegetation, sod, topsoil, paving, and gravel, prior to excavation. Remove tree stumps so that they do not constitute an obstruction to services and underground work or cause later settlement of paved areas.

.2 Dig out and remove all roots, boulders, loose rocks or other obstructions encountered. If any large rocks are excavated they may be left on site provided they are located as directed by the Consultant.

.3 All trees and plants to be retained must be properly protected, to municipal standards.

.4 Stockpile topsoil of horticultural value on site, in area acceptable to Consultant, for spreading on site at areas to be sodded or landscaped.

3.2 **TESTING OF TOP SOIL**

.1 Have topsoil tested for herbicide contamination prior to stripping. Submit test results to Consultant.

.2 Do not handle topsoil in wet or frozen condition.

3.3 **SURPLUS MATERIAL**

.1 Remove surplus materials from site. On site material can be used as fill only at landscaped areas, and only subject to approval by the Consultant and testing company.

.2 Remove materials unsuitable for fill, grading or landscaping from site.

.3 Note that the Contractor is entirely responsible for determining the amount of usable topsoil on site. Claims for removal or supply of topsoil will not be considered.

END OF SECTION

PART 1 - GENERAL

1.1 RELATED WORK

.1	Site Clearing	Section 31 10 00
.2	Excavation and Fill	Section 31 23 00

1.2 SITE CONDITIONS

.1 Establish the location of all utilities and buried objects prior to commencement of any work.

.2 Contractor will be responsible for providing adequate site access and storage areas.

.3 It is assumed that all soils adjacent to and below asphalt and concrete paving will be contaminated with de-icing salts. Include for disposal at facilities accepting salt contaminated materials.

.4 All existing fill below the building and paved areas must be removed to the level of undisturbed subsoil, prior to the placing any new fill, engineered fill, or paving. Existing soils are not suitable for re-use as backfill material and excavated materials are to be removed from site.

.5 Conform with City of Oshawa Excess Soils Management Requirements and O. Reg. 406/19.

1.3 PROTECTION

.1 Prevent damage to existing natural features, bench marks, surface or under-ground utility lines which are to remain. Make good any damage.

PART 2 - MATERIALS

2.1 MATERIALS

.1 Obtain Consultants approval of all material used as fill for grading work. Protect approved material from contamination.

.2 All backfilling and granular materials must conform to Section 31 23 00. Fill types referenced below are listed in that Section.

.3 Fill at landscaped/sodded areas:
- .1 Fill shall be clean imported fill, free from contaminants, and approved by Inspection Company (Fill Type F6).
- .2 A limited amount of on site materials may be available for reuse (Fill Type F4) subject to approval of the testing and inspection company.

.4 Fill at paved areas:
- .1 Fill shall be Fill Type F2, clean, granular imported fill, suitable for compaction to 98% Standard Proctor modified dry density and approved by Inspection Company.

PART 3 - EXECUTION

3.1 GRADING

.1 Rough grade to depths required for surface finishes indicated.

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

.3 Prior to placing fill over existing ground at building and paved areas remove any wet and/or soft spots and re-compact the surface to minimum 98% Standard Proctor Maximum Dry Density.

.4 Slope rough grade away from the building at minimum slope of 2% min.

.5 Grade swales to depth required for maximum run-off as indicated.

.6 At pavement areas, lay and compact additional fill Type F2 to at least 98% of its Standard Proctor maximum dry density, prior to placement of the granular sub-base course. Remove soft or saturated areas encountered, replace with approved imported fill, and compact as above.

.7 At sodded and landscaped areas, bring grades up to levels required for placement of topsoil with imported fill. Lay and compact fill generally to 95% Standard Proctor maximum dry density to ASTM D698.

3.2 FINISH GRADING

.1 Import and place topsoil to depths indicated at sodded, seeded and landscaped areas. Fine grade and loosen topsoil. Eliminate rough spots and low areas to ensure positive drainage.

.2 Roll to consolidate topsoil for areas to be sodded, leaving surface smooth, uniform, firm against deep foot printing. Refer to Section 32 91 00 for topsoil.

3.3 SURPLUS MATERIAL

.1 Remove surplus material from site in accordance with Township of Scugog Excess Fill Requirements and O. Reg 406/19.

.2 On site material, approved by Consultant, can be used as fill only at landscaped areas.

.3 Remove material unsuitable for fill, grading or landscaping from site.

END OF SECTION

PART 1 - GENERAL

1.1 RELATED WORK SPECIFIED ELSEWHERE

.1	Site Clearing	Section 31 10 00
.2	Grading	Section 31 22 00
.3	Asphalt Paving	Section 32 12 16
.4	Sodding	Section 32 92 23

1.2 PROTECTION

.1 Protect existing buildings, fencing, service poles, wires, underground services and paving located on this and adjoining properties from damage. Make good damage resulting thereto to the approval of the Consultant and at no cost to the Owner. Make good any damage due to inadequate bracing, or improper compaction of backfill at no cost to the Owner. Maintain carefully all bench marks, and other reference points. If disturbed or missing, replace as directed by a Registered Ontario Land Surveyor at no cost to the Owner.

.2 Provide protection and heating as necessary where the bearing surface is in danger of freezing before concrete is poured.

.3 Do not load vehicles employed in the cartage of materials beyond rated limits, nor in such a manner as to cause spillage. Promptly remove spillage and tire tracking on public property. Alert drivers to the right of way of pedestrians and other vehicular traffic at exit from the site.

1.3 FIELD QUALITY CONTROL

.1 Employ the inspection and testing company appointed by the Consultant to test proposed fill material and to inspect, test and approve compaction of fill.

.2 Testing company shall provide continuous supervision during preparation, placing, and compacting of Engineered Fill.

.3 The Inspection and Testing company shall carry out the following:

.1 Inspect the subgrade prior to proof rolling to ensure that it is sufficiently dry and stable to carry out the proof rolling operation.

.2 Inspect the source of the proposed granular material to determine the potential for the pit for quality consistency of the product.

.3 Carry out grain-size analysis on sample of each type of granular fill to ensure that proper material is being placed.

.4 Provide continuous supervision of engineered fill operation, controlling the moisture content for even compaction and maximum density for every lift.

.5 Conduct constant compaction testing, using a nuclear moisture-density gauge, throughout the placement of all backfill material.

.4 Co-operate with the inspection company and give adequate notification of any changes in sources of supply, additional work shifts and any other proposed changes.

.5 The cost of such inspection and testing shall be paid for under Section 01 10 00. The cost of retesting unacceptable compaction shall be borne by the Contractor.

.6 Any recommendation made on site by the Inspection & Testing Company which will result in extra cost must be approved by the Consultant BEFORE the work proceeds or claims for additional payment will not be accepted.

.7 The Contractor shall be responsible for determining the quantity of fill that is likely to be usable on site, for landscaped areas only, based on information provided in geotechnical reports. Contractor must assume responsibility for drying of fill as required to achieve compaction results specified. All on-site materials must be approved for use by the Inspection Company, and are subject to the same testing requirements and standards as imported materials. Remove all materials which are deemed unsuitable for re-use. Note that all fill materials below building and paving areas must be imported materials.

1.4 **CONTAMINATED FILL**

.1 It is assumed that all soils adjacent to and below all asphalt and concrete paving will be contaminated with de-icing salts. Include for disposal at facilities accepting salt contaminated materials.

.2 Where reports indicate other areas of contaminated fill, arrange for disposal at specialized facilities accepting such contaminated fills.

.3 No extras will be permitted for disposal of contaminated fills, where such requirements should be reasonably predictable by examination of the site.

1.5 **TRUCKING COSTS**

.1 The Contractor is responsible for all costs related to trucking required for the Contract. No extra costs will be considered for weight load or limits due to seasonal conditions or restrictions on load capacities imposed by any authorities or any similar limitations or factors.

PART 2 PRODUCTS

2.1 **MATERIALS**

.1 All fill materials to be imported, from approved sources, with the exception of approved site materials classified as Fill Type F4, below.

.2 Fill material: approved materials free from organic matter, rubbish and other deleterious materials and complying with the following requirements:

.1 Fill Type F1: imported, clean, clear crushed stone, 19mm size, imported from approved source

.2 Fill Type F2: imported, clean, natural river sand and gravel material, free from silt, clay, loam, friable or soluble materials and organic matter graded within the limits of OPSS.MUNI 1010 granular Class ‘B’ Type 1 material

.3 Fill Type F3: concrete backfill 15 MPa strength at 28 days complying with the requirements of Section 03 30 00

.4 Fill Type F4: approved granular, free draining material excavated from the Site, free from rubbish, organic and vegetable matter, topsoil and large clay lumps and boulders

.5 Fill Type F5: imported, non-frost susceptible sand

.6 Fill Type F6: imported, clean, free draining fill suitable for landscape areas

PART 3 - EXECUTION

3.1 PREPARATION

.1 Carefully examine Site including access to the Site. Site is required to be cleared and rough graded, as specified, prior to commencing excavation and fill work.

.2 Establish the extent and nature of the materials, which may be necessary to remove and the amount of fill to provide the required grades.

.3 Check dimensions at the Site before commencing excavation work and report discrepancies to the Consultant.

.4 Consult utilities to ascertain location of services. Promptly notify the Consultant if uncharted services or drainage lines are uncovered during excavation. Cap services to the approval of the utilities affected.

.5 Provide suitably located bench marks for elevation control and selected grid line references. Provide detailed line and grade staking for elements of the earth work.

3.2 EXCAVATION

.1 Do all excavation required for the Work excluding mechanical and electrical trades. Excavate beyond property lines to extent noted on Drawings for this Contract.

.2 Excavate to depth required for footings, and for slab on grade and underbed. Base of footings and foundation shall be not less than 1300mm below finished grade.

.3 Excavations carried too low shall be filled with 15 MPa min. concrete at no additional expense to the Owner. Obtain prior approval for lowering footings.

.4 Trim bottom of excavations and obtain approval of the Consultant and authorities having jurisdiction before placing concrete or granular material.

.5 Protect ground and/or bottom of excavation to prevent freezing using suitable insulation materials. If ground is frozen at foundation level when concrete is about to be placed, defrost or excavate to lower depth where ground is not frozen, and extend new construction down to new approved foundation level at no extra cost to Owner. *DO NOT PLACE CONCRETE ON FROZEN GROUND*. Frozen ground shall not delay progress of work.

.6 Should soil at depth shown prove to be unsatisfactory to the Consultant for placing of structural work thereon, upon the Consultant's written order, excavate to greater depth until a satisfactory bottom is reached. All work to be verified by Inspection and Testing Co.

.7 At slab-on-grade and paved areas, surface compact existing soil to 98% SPMDD. Bring grade up to underside of granular base or sub-base as specified below for backfilling.

3.3 **BACKFILLING**

.1 Do not backfill over frozen ground. Do not place backfill until the sub-grade, footings, foundation walls and drainage tile have been inspected and approved. Do not backfill at ambient temperatures below 0°C. without approval. Do not use frozen materials as backfill. Temporary backfilling not permitted. Be responsible for damage to buried services, due to backfilling.

.2 Place fill material against both sides of walls. If it is not practical to carry out backfilling in this manner, brace the walls adequately to prevent damage to the walls.

.3 Where walls are to be backfilled on one side only, commence backfilling only when the structural members are in place or adequate bracing is provided for top and bottom of foundation walls.

.4 Backfill service line trenches to depth required, with backfill material as specified below. All fill under floor slabs and paving must be imported materials. Backfilling of trenches in landscaped areas shall be with fill Type F4, suitable on-site materials; refer to Section 33 10 00.

.5 Fill locations:

.1 Use Type F1 fill under all exterior concrete sidewalks and curbs to a minimum compacted depth of 200mm.

.2 Use Type 1 fill under rubber tiles at depth of 200mm.

.3 Use Type F2 fill below Type F1 base at concrete sidewalks, curbs and below sub-base at asphalt paving where required to bring grade above existing levels. Refer to Section 32 12 16 for base and sub-base below asphalt paving.

.4 Use Type F2 fill below topsoil for sodding where future heavy duty asphalt paving is indicated above retaining wall.

.5 Type F4 fill may be used under landscaped areas only, below topsoil, and then only subject to approval by the testing and inspection company.

.6 Use Type F6 fill , or approved Type F4 fill, under topsoil areas.

.6 Properly roll, tamp or otherwise consolidate in place each layer of backfill. Maintain fill within 2% of its optimum moisture content. If fill is too dry, dampen it with water to obtain the water content required. If the fill is too wet, aerate it.

.7 Spread fill in layers not exceeding 150mm uncompacted depth. Carry out fill operations systematically. Prevent segregation of particle sizes. Compact as detailed below.

.8 After backfilling and compaction is completed, scarify surface to a uniform depth sufficient to eliminate depressions and irregularities.

3.4 **COMPACTION**

.1 Compact until the required density is achieved. Do not compact any material containing frost.

.2 Fill hollows and depressions which develop under compaction with matching backfill material. If the base becomes rutted or displaced due to any cause, regrade the surface.

.3 Compaction Method:
- .1 Compact backfill by means of vibrator type equipment capable of achieving the desired degree of compaction.
- .2 Use manually operated vibratory tampers in the proximity of foundations and retaining walls, and in areas not readily accessible to roller equipment.
- .3 Make good damage to the structure due to compaction and settlement of fill.
- .4 Report damage to foundation promptly to the Consultant. Obtain approval of remedial procedures.

.4 Compact Type F1 fill to refusal using 8 ton (7.26 tonnes) rollers or equivalent vibrators to 98% Standard Proctor Maximum Dry Density.

.5 Compact Type F2 fill generally to 98% Standard Proctor Maximum Dry Density.

.6 Compact engineered fill to 100% Standard Proctor Maximum Dry Density.

.7 Compact Type F2 fill to 98% Standard Proctor Maximum Dry Density where required to raise grade below concrete slabs and paving, and asphalt paving. This includes area of future asphalt paving at top of retaining wall.

.8 Compact Type F3 fill as Specified on Structural drawings.

.9 Where Type F4 fill is used below landscaped areas, compact to 95% Standard Proctor Maximum Dry Density.

.10 Compact Type F5 fill to 95% Standard Proctor Maximum Dry Density.

.11 Backfill in trenches below building and asphalt and concrete paving shall be compacted to minimum 98% Standard Proctor Maximum Dry Density, and as required for backfill below those areas. Backfill of trenches in other areas must be compacted to 98% SPMDD for at least the top 1000mm; and to minimum 95% SPMDD below that level. Refer also to Section 33 10 00, Site Services.

.12 Make good any damage caused by uncompacted backfill at no cost to the Owner.

END OF SECTION

PART 1 - GENERAL

1.1 WORK INCLUDED

.1 This Section includes all new and replacement asphalt paving, including base and sub-base, as indicated on drawings and as required to complete the work indicated. Refer to architectural site plan to determine areas requiring medium duty asphalt.

.2 Coordinate with forces removing existing sodded areas and asphalt pavements. Provide new compacted base and subbase below infill sections of asphalt; existing base materials are not to be reused. Coordinate removals of existing materials as required to accommodate new work.

1.2 RELATED WORK SPECIFIED ELSEWHERE

.1	Demolition	Section 02 40 00
.2	Site Clearing	Section 31 10 00
.3	Pavement Markings	Section 32 17 23

1.3 REFERENCES

.1 Ontario Provincial Standard Specifications:

.1	OPSS 310	Construction Specification for Hot Mix Asphalt
.2	OPSS1150	Material Specification for Hot Mix Asphalt
.3	OPSS.MUNI 1003	Material Specification for Aggregates - Hot Mix Asphalt
.4	OPSS.MUNI 1004	Material Specification for Aggregates - Miscellaneous
.5	OPSS.MUNI 1010	Material Specification for Aggregates - Base, Subbase, Select Subgrade, and Backfill Material

1.4 QUALITY ASSURANCE

.1 Qualifications: Paving Subcontractor must have minimum 5 year history of successful work of this type and scope. If requested by Consultant or Owner, furnish references.

.2 All work on municipal property must additionally meet or exceed municipal standards.

.3 All granular materials shall be imported materials, from approved sources. On site materials may not be used as fill, sub-base or base materials under asphalt paving.

1.5 INSPECTION AND TESTING

.1 Employ the Inspection and Testing Company appointed by the Consultant to do testing and inspection as outlined below. Payment shall be through the Cash Allowance included in the Contract.

.2 Paving Inspection and Testing shall consist of the following:

.1 Laboratory testing of aggregates, asphaltic cements, and asphaltic concrete, to confirm compliance to specifications.

.2 Laboratory Mix Design evaluation to confirm that the precise proportions of asphaltic concrete components meet the specified properties for the asphalt mix.

.3 Verification of compaction of subgrade.

.4 Quality control during placement, including field sampling and lab testing, and monitoring of asphalt temperature.

.5 Field monitoring and verification of depth and compaction of sub-base, base, and asphalt layers.

1.6 **SUBMITTALS**

.1 Provide samples of all aggregates and other materials proposed for use in asphaltic concrete to Inspection and Testing Company. Fully identify samples as to nature of material, source, job number and name of Subcontractor. Submit a grading analysis with each sample.

.2 Concurrently with the above, submit a copy of each grading analysis to the Consultant, along with a copy of the transmittal listing the samples sent to the Inspection and Testing Company.

.3 Approved samples and their grading analysis shall constitute a standard of aggregate for asphaltic concrete surface course.

1.7 **WARRANTY**

.1 Provide a **two (2) year** written warranty for the work of this section. Warrant work against settlement, failure, frost boil and other deterioration or damage.

.2 Promptly upon notification by Owner, repair or make good without delay any such settlement, failure, deterioration or damage.

PART 2 - PRODUCTS

2.1 **MATERIALS**

.1 Upon request, provide satisfactory proof of quality of material brought to the job site.

.2 All granular materials shall have an in-situ moisture content within 2% of their optimum moisture content.

.3 Aggregates must conform to OPSS.MUNI 1010, Material Specification for Aggregates - Base, Subbase, Select Subgrade and Material Backfill, and shall be as follows:

.1	Sub-base:	OPSS 50mm Crusher-Run Limestone
.2	Base	OPSS 19mm Crusher-Run Limestone

.4 Asphaltic concrete shall conform to OPSS1150, Material Specification for Hot Mix Asphalt, and shall be as follows:

.1 Binder Course: OPSS HL8
.2 Surface Course: OPSS HL3. Submit gradation limits of proposed aggregate to Consultant for approval.

.5 Tack Coat: Emulsified asphalt type SS-1, to OPSS 1103

.6 Filter Fabric: Terratrack 200W Woven Geotextile by Terrafix Geosynthetics Inc.

PART 3 - EXECUTION

3.1 INSTALLATION

.1 General

.1 Make minimum fall to drainage on finished paving 1%.

.2 Fine grade and compact existing undisturbed bed soil and compacted fill to proper grade and contour on areas to be paved and 900mm beyond, before placing sub-base and base courses. Refer to Section 31 22 00 - Grading.

.3 Supply and install calcium chloride as required.

.4 Make surface course free from depressions exceeding 6mm as measured with a 3000mm straight edge parallelling centre line of driveway.

.5 Immediately prior to placing of sub-base materials, proof roll exposed subgrade with heavy rubber-tired vehicle. Sub-excavate any soft, loose, or unstable areas and fill with Fill Type

.2 Composition: Compacted thicknesses of materials and order of application for types of paving required shall comply with the following table.

.1 Asphalt paving, general:

Course	Medium Duty mm
Sub-base	250
Base	150
Binder	40
Surface	40

.2 Refer to drawings for locations of paving types. Driveways, parking areas and fire routes must receive heavy duty paving.

.3 Roadways: to municipal Standards. Provide entrances and curbs on roadway, complete with signage and road markings.

.3 Joints:

.1 Make joints between old asphalt or concrete and new asphalt or between successive day's work straight and watertight with positive bond. Cut back to expose fresh vertical surface, free of broken or loose material.

.2 Cut back rolls or depressions in existing edges and bring back to grade with new material.

.3 Before placing hot asphalt, paint joints with thin uniform coating of emulsified asphalt.

.4 Make keyed or butt joints. Feathering not permitted.

.4 Asphaltic Paving:

.1 If subgrade is wet, or damp, install filter fabric over compacted subgrade prior to placing granular sub-base.

.2 Place granular fill materials in uniform lifts not exceeding 200mm loose thickness.

.3 Place sub-base granular course to thickness noted and compact to 98% Standard Proctor Density.

.4 Install base course and compact to 98% Standard Proctor maximum dry density.

.5 Place asphaltic courses at temperatures recommended by OPSS documents. Place spread, and compact asphaltic courses in accordance with OPSS 310, and as specified herein.

.6 Compact asphaltic concrete courses to at least 97% Marshall density.

.7 Compact each asphalt course as soon as it can bear roller without undue displacement or hair cracking. Use power driven roller weighing a minimum of 9 tonnes and exerting a pressure on the roller of at least 4.5 kg/mm roll width.

.8 Continue rolling until all roller marks are eliminated. The speed of the roller shall at all times be slow enough to avoid displacement of the mixture. Keep roller wheels slightly moistened by water to prevent adhesion of the mixture but an excess of water will not be permitted. Compact the mixture with hot tampers in locations that are not easily accessible to the machine roller.

.9 Upon completion of compaction each pavement course shall be - smooth and true to crown and grade with variation not more than 6mm from the thickness specified. Do not place any asphaltic course less than 40mm thick nor more than 75mm thick.

.5 Replacement:

.1 To replace unacceptable paving, remove existing asphaltic concrete, base and sub-base, and re-apply materials as specified.

END OF SECTION

PART 1 - GENERAL

1.1 RELATED WORK

.1	Grading	Section 31 22 00
.2	Excavation and Fill	Section 31 23 00
.3	Asphalt Paving	Section 32 12 16

1.2 REFERENCES

.1 ASTM International:

.1	ASTM A185/ A185M	Standard Specification for Steel Welded Wire Reinforcement, Plain, for Concrete.
.2	ASTM C295	Standard Guide for Petrographic Examination of Aggregates for Concrete.
.3	ASTM C309	Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete
.4	ASTM D1751	Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Non-extruding and Resilient Bituminous Types)
.5	ASTM D3963/D3963M	Standard Specification for Fabrication and Jobsite Handling of Epoxy-Coated Steel Reinforcing Bars.

.2 Canadian Standards Association (CSA):

.1	CAN/CSA A5	Portland Cement
.2	CSA A23.1	Concrete Materials and Methods of Concrete Construction
.3	CSA A23.2	Methods of Test for Concrete.
.4	CAN3 A266.1	Air-Entraining Admixtures for Concrete.
.5	CSA G30.18	Carbon Steel Bars for Concrete Reinforcement
.6	CSA A283	Qualification code for Concrete Testing Laboratories

.3 Conform to the barrier-free access provisions of the Ontario Building Code and the Design of Public Spaces Standards of O.Reg. 191/11, Integrated Accessibility Standards, under the Access for Ontarians with Disabilities Act.

1.3 QUALIFICATIONS

.1 Concrete supplier to be a member of the Ready-Mixed Concrete Association of Ontario.

.2 Cement finisher to have at least five (5) years of specialized experience.

1.4 SUBMITTALS

.1 Submit shop drawing showing layout of tactile warning indicators, particularly where different sizes are required.

.1 Provide product data sheets and installation instructions. Provide colour charts for colour selection by the Consultant.

.2 Provide samples for coloured concrete, as indicated below.

1.5 **TESTING**

.1 Contractor will be responsible for the coordination and payment for all required testing services.

.2 During the construction process, compaction testing on the subgrade and granular base will be carried out by an approved testing firm. Any delays caused by failing tests and subsequent remediation work will be the responsibility of the contractor.

.3 Inspection and testing of concrete and concrete materials will be carried out in accordance with CSA A23.1 by a Testing Agency designated by the Consultant. Testing agency shall be certified under CSA A283 with category to suit testing provided.

1.6 **SAMPLE INSTALLATION**

.1 Construct a 1000 x 1000mm sample flatwork panel sample for each specified texture of concrete. Advise Consultant when samples are ready for review; provide minimum 3 days notice for review.

PART 2 - MATERIALS

2.1 **MATERIALS**

.1 Concrete mixes and materials:
- .1 to Section 03 30 00 - Cast-in-Place Concrete.
- .2 Concrete for all concrete paving and curbs shall be 32 MPa, Class C-2.

.2 Granular base: Fill Type F1, as identified in Section 31 23 00, Excavation and Fill.

.3 Clear Curing Compound: W.R. Meadows 1300 clear water-base wax base curing compound.

.4 Pigmented Curing Compound: W.R. Meadows 1220-White, for curbs and walkways which will not be sealed, painted, tiled, or otherwise covered.

.5 Form release agent: Non-staining mineral type, chemically active release agents containing compounds that react with free lime to provide water soluble soap. W.R. Meadows “Duogard 11" water - based form release agent.

.6 Form lumber: 38mm x 184mm (2 x 8), free of warp.

.7 Epoxy-coated Reinforcement:
- .1 #10M epoxy coated continuous bars, placed as indicated on drawings.
- .2 Epoxy coated reinforcement shall conform to specifications of section 03 20 00.

.8 Welded Wire Mesh: grade 400 conforming to CSA G30.5, unless indicated otherwise. Mesh shall be supplied in flat sheets only.

.9	Premoulded expansion joint filler:	W.R. Meadows "Fibre Expansion Joint" asphalt saturated expansion-contraction joint filler, 10mm thick x depth of slab.
.10	Joint Sealant:	cold applied rubber-asphalt sealer. W.R. Meadows #158 cold applied sealer.

PART 3 - EXECUTION

3.1 GENERAL

.1 Conform to the specifications of Division 03, Concrete, for the work of this Section, and the additional requirements herein. In the event of a perceived inconsistency, the more stringent requirements shall be applied.

3.2 LINES AND LEVELS

.1 Employ a competent surveyor to establish and maintain all required lines and levels. Report field dimensions which do not agree with drawing dimensions to the Consultant immediately.

.2 Review grading and ensure that slopes and levels conform to drawings. Ensure continuous and smooth transition between concrete curbs surrounding new rubber tile and artificial turf play areas.

3.3 GRANULAR BASE

.1 Obtain Consultant's approval of subgrade before placing granular base.

.2 Place granular base material to lines and widths as indicated on drawings, and to depths as specified in Section 31 23 00, Excavation and Fill,.

.3 Compact granular base to at least 98% of its SPMDD.

3.4 FORMWORK

.1 Before proceeding with formwork, verify all lines and levels and ensure dimensions agree with drawings.

.2 Construct forms to produce finished concrete conforming to the shape, dimensions, locations and levels shown on the drawings.

.3 Keep form joints to a minimum.

.4 Clean formwork in accordance with CSA CAN3-A23.1.

.5 Obtain Consultant's approval of formwork, granular base and reinforcing steel prior to placing concrete. The proper time for form removal shall be approved by the Landscape Architect.

.6 Remove forms in accordance with CSA Standard CAN3-A23.1.

3.5 **REINFORCEMENT**

.1 Clean reinforcement of loose rust and mill scale.

.2 Place reinforcement as indicated on drawings.

.3 Place 10M tie bars at maximum 600 mm spacing and extend 300 mm into both sides of construction joints. Set half of tie bar lengths in capped sleeves to allow longitudinal movement.

3.6 **CONCRETE PAVEMENT**

.1 Obtain Consultant's approval of formwork, granular base and reinforcing steel prior to placing concrete.

.2 Do concrete work in accordance with Section 03 30 00, Cast-in-Place Concrete, and as specified herein.

3.7 **CONCRETE MIXING**

.1 Control concrete mix and source of materials to ensure batch to batch uniformity. Do not change cement type or manufacturer or source or type of aggregate or sand.

.2 Do not mix less than 3 cu.m. in any one batch. Where possible mix, deliver and place concrete of same colour in sequential pour on the same day. Finish at same time duration after placing.

.3 Do not pump concrete.

.4 Ensure minimum 130 revolutions of concrete batch before depositing.

3.8 **CONCRETE PLACEMENT**

.1 Protect adjacent surfaces when placing and finishing concrete and when applying curing compound.

.2 Coloured Concrete:

.1 Provide contrasting coloured paving at all curb ramps. Coordinate installation of tactile warning indicators, as indicated below.

.3 Immediately after floating, give pavements a uniform broom finish to produce regular corrugations not exceeding 2 mm deep, by drawing broom across the direction of travel.

.4 Apply concrete curing compound with airless sprayer at a rate to cover 7-10 sq.m. per litre.

.5 Place 10M rebar dowel into section of freshly poured concrete, where additional concrete abuts pour. Dowels to be embedded 300mm into fresh concrete and extend 300mm beyond face into proposed abutting concrete. Locate min. 50mm below surface and at 600mm O.C.

3.9 **CURBS AND EDGES**

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

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

.3 Keep form joints to minimum.

.4 Clean formwork in accordance with CAN/CSA-A23.1 before placing concrete.

.5 Concrete edges to receive steel trowel final finish.

.6 Construct curb ramps for barrier-free access as shown and detailed.

.7 Construct poured concrete curbs at perimeter of synthetic grass surfaces and rubber base tile as detailed on drawings.

3.10 **TOLERANCES**

.1 Finish surfaces to within 3 mm in 3 m as measured with straightedge placed on surface.

3.11 **EXPANSION AND CONTRACTION JOINTS**

.1 Saw cut contraction joints @ 1200 O.C. after concrete has set.

.2 Install expansion joints @ 3600 OC, complete with premoulded expansion joint filler.

.3 Install expansion joints around manholes and catch basins and along length adjacent to concrete curbs, catch basins, buildings, or permanent structures.

.4 Install joint filler in expansion joints in accordance with Section 03 30 00 - Cast-in-Place Concrete.

.5 Seal expansion joints with sealant approved by Consultant, finished flush with top surface of concrete.

.6 Do not radius edges at expansion joints.

.7 Align curb, gutter and sidewalk joints.

3.12 **CURING**

.1 Curing of concrete slabs shall be effected by using well-lapped sheets, tarpaulins or heavy quality building paper laid down on the wetted surface of the slab which shall be continuously wet for a minimum of ten (10) days.

.2 All concrete pavings and curbs to be sprayed with Pete-Cure M.T.C. specified grade or two (2) coats of linseed oil thinned with napha, mineral spirits, or turpentine applied in accordance with the procedures set out in Portland Cement Association brochure "Protection of Concrete Pavements from Salt and Calcium chloride".

.3 Apply curing compound evenly to form continuous film. Follow manufacturer's instructions.

.4 By means acceptable to the Consultant and Authorities Having Jurisdiction, protect concrete from harmful effects of sunshine, drying winds and cold running of surface water for a minimum period of five days.

3.13 **PROTECTION AND CLEAN UP**

.1 Upon completion of any portion of the concrete work, remove all debris and excess materials from the site and leave in a neat and tidy condition to the satisfaction of the Consultant.

.2 Clean tactile tiles immediately prior to occupancy of the building, using method recommended by the manufacturer.

END OF SECTION

PART 1 - GENERAL

1.1 DESCRIPTION

.1 Installation of Kindergarten play area pavement markings. Basis of design is StreetBond 120.

.2 Only Certified StreetBond Applications may bid for and perform the imprinted portion of this work.

.3 StreetBond coatings are manufactured by GAF and distributed in Canada by Hub Surface Systems - hubss.com.

1.2 RELATED WORK

.1	Asphalt Paving	Section 32 12 16

1.3 REFERENCES

.1	ASTM D4541	Standard Test Method for Pull-Off Strength of Coatings Using Portable Adhesion Tester.
.2	ASTM D4060	Test Method for Abrasion Resistance of Organic Coatings by the Taber Abraser.
.3	ASTM D2697	Standard Test Method for Volume of Nonvolatile Matter in Clear or Pigmented Coatings.
.4	ASTM D522-93A	Standard Test Method for Mandrel Bend Test of Attached Organic Coatings.
.5	ASTM D1653	Standard Test Method for water vapor transmission through organic film coatings.
.6	ASTM G154	QUV Accelerated Weathering Environment. Standard Practice for Operating Fluorescent Light Apparatus for UV Exposure of Nonmetallic Materials.
.7	ASTM D2369	Weight Solids Standard test method for Volatile Content of Coatings.
.8	ASTM D1475	Standard Test Method for Density of Paint, Varnish, Lacquer, Other related products
.9	ASTM D2240 (2000)	Standard Test Method for Rubber property – Durometer hardness.
.10	ASTM D5895	Standard Test Method of drying or curing during film formation of organic coatings using mechanical recorders.
.11	ASTM D570	Standard Test Method for water absorption of plastics.

1.4 **SUBMITTALS**

.1 A copy of the Accreditation Certificate, available from the Applicator, is required with submittal. Independent product test results available upon request.

.2 Submit samples in accordance with Section 01 33 23.

PART 2 - PRODUCTS

2.1 **MATERIALS**

.1 StreetBond Colorant is a highly concentrated, high quality, UV stable pigment blend designed to add color to StreetBond SB120 coatings. One unit of Colorant shall be used with one pail of StreetBond coating material.

.2 Properties of coatings

.1 Basis of design is Streetbond SB 120 & StreetBond Colorant.

TABLE 1: Typical Physical Properties of Coatings

Characteristic	Test Specification	
Solids by Volume	ASTM D2697	57%
Solids by Weight	ASTM D1644	74.7%
Density	ASTM D1475	14.0 lbs./gal (1.67kg/l)

TABLE 2: Typical Performance Properties of Coatings

Characteristic	Test Specification	
Dry time (To re-coat)	ASTM D5895 23°C; 37% RH	35 min
Taber Wear Abrasion Dry H-10 wheel	ASTM D4060 1 day cure	0.01%/1000 cycles
Taber Wear Abrasion Wet H-10 wheel	ASTM D4060 7 days cure	0.01%/1000 cycles
QUV Accelerate Weathering Environment	ASTM G - 151 ΔE 1,500hrs.	0.76 (Brick)
Hydrophobicity Water Absorption	ASTM D570	5%
Shore A Hardness	ASTM D2240	59
Mandrel Bend	ASTM D522 - 93A	1/4" @ 21 C

Permeance	ASTM D1653	13.43g/m2 /24 hr/mmHg (52 mils)
VOC	per MSDS	< 50 g/l
Adhesion	ASTM D4541	> 300psi (1980psi)
Friction Wet	ASTM E303 British Pendulum Tester	Wet = 66 Dry = 77

PART 3 - EXECUTION

3.1 GENERAL

.1 StreetBond coating shall be supplied and applied by a Certified StreetBond Applicator with appropriate certification on non-textured and stamped surfaces if stamped asphalt is included in the project, in accordance with the plans and specifications or as directed by the Owner. Do not begin installation without confirmation of appropriate Accreditation Certificate(s). Specifications for the execution of the StreetPrint system can be found at hubbs.com.

3.2 PRE-CONDITIONS

.1 Prerequisites for New Asphalt Pavement

.1 A durable and stable asphalt pavement mix design installed according to best practices over a properly prepared and stable substrate is a pre - requisite for all long - lasting asphalt pavement surfaces. The application of StreetBond does not change this requirement.

.2 Pavement Marking Removal: recommended guidelines

.1 Pavement markings may be removed by sandblasting, water - blasting, grinding, or other approved mechanical methods. The removal methods should, to the fullest extent possible, cause no significant damage to the pavement surface.

The Owner shall determine if the removal of the markings is satisfactory for the application of StreetBond coatings. Work shall not proceed until this approval is granted.

.3 Surface Preparation

.1 The asphalt pavement surface shall be dry and free from all foreign matter, including but not limited to dirt, dust, de-icing materials, and chemical residue.

3.3 APPLICATION

.1 Coating Application Guidelines

.1 The Applicator shall use the SB Flex Spray System or suitable texture coatings sprayers to apply the StreetBond coatings.

.2 The asphalt pavement surface shall be completely dry and thoroughly cleaned prior to application of the coatings.

.3 The coating application shall proceed as soon as practical upon completion of the imprinting of the asphalt pavement where applicable.

.4 For polished asphalt, StreetBond Adhesion Promoter should be applied directly to the asphalt and allowed to dry completely prior to the first layers of coating.

.5 For concrete surfaces, StreetBond WB Concrete Primer or StreetBond QS Concrete Primer should be applied and allowed to cure prior to the first layers of coating. Please consult Technical Data sheets for more details on applications.

.6 The first layer of coating shall be spray applied then broomed to work the coating material into the pavement surface. Subsequent applications shall be sprayed then broomed or rolled. Each application of coating material shall be allowed to dry to the touch before applying the next layer.

.7 The Contractor shall apply the StreetBond coatings only when the air temperature is 50°F / (10°C) and rising and will not drop below 50°F / (10°C) within 24 hours. No precipitation should be expected within 24 hours.

3.4 COATING COVERAGE & THICKNESS

.1 Coating coverage and thickness is as outlined in TABLE 4 below. Actual coverage may be affected by the texture of the asphalt pavement substrate and the imprint pattern selected. There will be less coverage with the first layer and higher coverage with subsequent layers.

TABLE 3: Coating Coverage & Thickness

# OF LAYERS	COVERAGE (approx.)		THICKNESS (approx.)			
	NON-TEXTURED		WET		DRY	
	sq ft / unit	sq m / unit*	mm	mil	mm	mil
3	200	18.6	0.84	33	0.48	19

3.5 RECOMMENDED COATING COVERAGE RATES

.1 Please check with Hub Surface Systmes in advance to confirm the recommended application for the climate conditions at the project location.

TABLE 4: Recommended Coating Coverage Rates

Application	Hot Dry Climate	Temperature/Winter Climate
Pedestrian only	3 layers at 600 ft^2 (56m^2) per 5 gallon (20 Litre) unit for a net coverage of 200 ft^2 (18.6 m^2) per 5 gallon (20 Litre) unit	3 layers at 600 ft^2 (56 m^2) per 5 gallon (20 Litre) unit for a net coverage of 200 ft^2 (18.6 m^2) per 5 gallon (20 Litre) unit

.1 Additional layers of StreetBond SB120 coatings may be used to provide additional build thickness in high wear areas.

.2 A maintenance program may be required for applications exposed to:
- .1 abrasive materials (such as salt and sand)
- .2 abrasive equipment (such as snow removal equipment)
- .3 Studded winter tires

3.6 **OPENING TO USE**

.1 Minimally, StreetBond SB120 coating must be 100% dry and sufficient curing time must be allowed before traffic is permitted on the surface. Refer to manufacturer's installation instructions.

.2 If StreetBond coatings are applied when moisture cannot evaporate, then the coating will not dry. The drying and curing of StreetBond coatings have a direct impact on performance.

END OF SECTION

PART 1 - GENERAL

1.1 SECTION INCLUDES

.1 Resilient, interlocking, playground safety surfacing tiles.

1.2 RELATED SECTIONS

.1	Aggregate Base Course	Section 31 11 00
.2	Furnishings	Section 32 33 00
.3	Cast-in-Place Concrete	Section 03 30 00
.4	Concrete Paving and Curbs	Section 32 13 13

1.3 REFERENCES

.1 ASTM International:

.1	ASTM C 67	Standard Test Methods for Sampling and Testing Brick and Structural Clay Tile.
.2	ASTM C 501	Standard Test Method for Relative Resistance to Wear of Unglazed Ceramic Tile by the Taber Abrader.
.3	ASTM D 412	Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers-Tension.
.4	ASTM D 573	Standard Test Method for Rubber-Deterioration in an Air Oven.
.5	ASTM D 624	Standard Test Method for Tear Strength of Conventional Vulcanized Rubber and Thermoplastic Elastomers.
.6	ASTM D 2047	Standard Test Method for Static Coefficient of Friction of Polish-Coated Floor Surfaces as Measured by the James Machine.
.7	ASTM D 2859	Standard Test Method for Ignition Characteristics of Finished Textile Floor Covering Materials.
.8	ASTM D 3676	Standard Specification for Rubber Cellular Cushion Used for Carpet or Rug Underlay.
.9	ASTM E 303	Standard Test Method for Measuring Surface Frictional Properties Using the British Pendulum Tester.
.10	ASTM F 1292	Standard Specification for Impact Attenuation of Surface Systems Under and Around Playground Equipment.

.11 US Consumer Product Safety Commission (CPSC) Handbook for Playground Safety.

1.4 SUBMITTALS

.1 Comply with Section 01 33 00 - Submittal Procedures.

.2 Product Data: Submit manufacturer's product data, including installation and subsurface instructions.

.3 Samples: Submit manufacturer's sample of 1 full tile.

.4 Test Reports: Submit certified test reports from qualified independent testing agency indicating results of the following tests:

.1	Impact Attenuation:	ASTM F 1292.
.2	Freeze Thaw:	ASTM C 67.
.3	Rubber Deterioration/Air Oven:	ASTM D 573.
.4	Slip Resistance:	ASTM D 2047 and E 303.
.5	Tensile Strength:	ASTM D 412.
.6	Elongation at Break:	ASTM D 412.
.7	Tear Strength:	ASTM D 624.
.8	Peak Load:	ASTM D 624.
.9	Density :	ASTM D 3676.
.10	Taber Abrasion:	ASTM C 501.
.11	Flammability:	ASTM D 2859

.5 Certificate of Compliance: Submit manufacturer's certificate of compliance indicating materials comply with specified requirements.

.6 Manufacturer's Project References:

.1 Submit list of 15 successfully completed projects.

.2 Include project name and location, name of architect, and type and quantity of playground safety surfacing tiles furnished.

.7 Installer's Project References:

.1 Submit copy of manufacturer issued installation certification.

.8 Maintenance Instructions: Submit manufacturer's maintenance and cleaning instructions.

.9 Warranty: Submit manufacturer's standard warranty.

1.5 **QUALITY ASSURANCE**

.1 Manufacturer's Qualifications: Manufacturer shall meet a minimum of 1 of the following 2 requirements.

.1 Continuously engaged in manufacturing of playground safety surfacing tiles of similar type to that specified, with a minimum of 10 years successful experience.

.2 Furnished a minimum of 15,000,000 square feet of playground safety surfacing tiles of similar type to that specified.

.2 Installer's Qualifications:

.1 Certified by manufacturer for installation of playground safety surfacing tiles.

.2 Approved by manufacturer.

1.6 **DELIVERY, STORAGE, AND HANDLING**

.1 Delivery: Deliver materials to site in manufacturer's original, unopened containers and packaging, with labels clearly identifying product name and manufacturer.

.2 Storage:

.1 Store materials in accordance with manufacturer's instructions.

.2 Playground Safety Surfacing Tiles:

.1 Store tiles in a dry area at a minimum temperature of 50 degrees F (10 degrees C) for a minimum of 72 hours before installation.

.2 Protect tiles from direct sunlight before installation.

.3 Adhesive: Store adhesive in a dry area at a minimum temperature of 50 degrees F (10 degrees C).

.3 Handling: Protect materials during handling and installation to prevent damage.

1.7 **ENVIRONMENTAL REQUIREMENTS**

.1 Tile Temperature: Ensure surface temperature of playground safety surfacing tiles is a minimum of 50 degrees F (10 degrees C) at time of installation.

.2 Air Temperature: Ensure air temperature is a minimum of 40 degrees F (4 degrees C) for a minimum of 24 hours before and during installation.

.3 Tile or Air Temperatures: Consult manufacturer's installation instructions for modified installation procedure when tile or air temperatures are above 85 degrees F (29 degrees C).

1.8 **WARRANTY**

.1 Materials and Workmanship: Playground safety surfacing tiles shall be warranted for defects in materials and workmanship for the lifetime of the playground.

.2 Performance: Playground safety surfacing tiles shall be warranted to meet drop height performance requirements of ASTM F 1292 for the lifetime of the playground.

PART 2 - MATERIALS

2.1 **MANUFACTURER**

.1 Basis of Design:

.1 SofSURFACES, Inc., 4393 Discovery Line, PO Box 239, Petrolia, Ontario N0N 1R0, Canada. Toll Free (800) 263-2363. Phone (519) 882-8799. Fax (519) 882-2697. Website www.sofsurfaces.com. E-mail nigel@sofsurfaces.com

2.2 PLAYGROUND SURFACING TILES

.1 Tiles: SofTILE DuraSAFE Series
- .1 Series: Premium 95 Series.
- .2 Description: Resilient, interlocking, playground safety surfacing tiles.
- .3 Compliance: Meet and exceed CPSC guidelines for impact attenuation.
- .4 Material: Compression-molded, recycled rubber and binding agents.
- .5 Tile Locking: U-shaped male and female configuration on all 4 sides to lock tiles to adjacent tiles.
  Edge Cut Grove on the vertical edge of all sides that creates a bridge for additional Tile to tile adhesion.
- .6 Top Edges: Chamfered.
- .7 Tile Bottom: Hollow core stanchion pattern.
- .8 Wear Layer: Premium Series: Virgin EPDM Skins. Minimum 0.0625 inch thick.
- .9 Size: 24 1/8" X 24 1/8" Nominal.
  Installed size: 24" X 24"
- .10 Thickness: Critical Fall Height 3 Feet: 2 inches.
- .11 Minimum Weight Each Tile:
  - .1 Premium Series:
    - .1 2.00-Inch Thickness: 25.00 pounds.
- .12 Colors:
  - .1 Premium 95 Series: RT1: Sangria
    RT2: Azure
    RT3: Sedona

.2 Test Results:
- .1 Impact Attenuation, ASTM F 1292:
  - .1 g-max Score: Less than 125.
  - .2 Head Injury Criteria (HIC) Score: Less than 700.
- .2 Freeze Thaw, ASTM C 67: No deterioration.
- .3 Rubber Deterioration/Air Oven, ASTM D 573: No deterioration.
- .4 Slip Resistance:
  - .1 ASTM E 303:
    - .1 Dry: 51 minimum.
    - .2 Wet: 44 minimum.
  - .2 ASTM D 2047:
    - .1 Plus: 0.533.
    - .2 Premium: 0.601.
- .5 Tensile Strength, ASTM D 412:
  - .1 Premium Series: .636 Mpa.
- .6 Elongation at Break, ASTM D 412:
  - .1 Plus Series 68.5 percent.
  - .2 Premium Series 35.3%.
- .7 Tear Strength, ASTM D 624:
  - .1 Premium Series: 2.4 kNm.
- .8 Flammability:
  - .1 Burning Pill, ASTM D 2859: Pass.
- .9 Density, ASTM D 3676:
  - .1 Premium Series: 859 kg/m3.
- .10 Taber Abrasion, Wear index, ASTM C 501:
  - .1 Premium Series: 77

PART 3 - EXECUTION

3.1 EXAMINATION OF SITE

.1 Examine areas to receive playground safety surfacing tiles. Notify Architect if areas are not acceptable. Do not begin installation until unacceptable conditions have been corrected.

3.2 PREPARATION

.1 Prepare subsurface in accordance with manufacturer's instructions to ensure proper slope, support and drainage for playground safety surfacing tiles.

.2 Fill Type F1 200mm thickness, refer to 32 11 00 - Aggregate Base Course.

3.3 INSTALLATION

.1 Install playground safety surfacing tiles in accordance with manufacturer's instructions at locations indicated on the Drawings.

.2 Ensure prepared subsurface and tiles are dry and clean.

.3 Layout tile surface in accordance with manufacturer's instructions.

.4 Apply adhesive in accordance with manufacturer's instructions for tile-to-tile as well as tile-to-base for all keystone and strategic tile rows.

.5 Installation to be completed by a factory trained and certified installer.

3.4 FIELD QUALITY CONTROL

.1 Installed Surface Performance Test: ASTM F1292

.1 Perform impact attenuation testing according to ASTM F1292 in presence of Owner's representative within 30 days of installation.
  .1 Confirm Impact Attenuation Performance of Surfacing Tiles:
    .1 g-max Score: Less than 125
    .2 Head Injury Criteria (HIC) Score: Less than 700

.2 Test Equipment Operator Qualifications:
  .1 National Recreation and Parks Association/National Playground Safety Institute (NRPA/NPSI) Certified Playground Safety Inspector (CPSI).
  .2 Trained in the proper operation of Triax test equipment by competent agency.

.3 Determine compliance with ASTM F 1292, unless otherwise specified in this section.

3.5 CLEANING

.1 Remove adhesive spills from playground safety surfacing tiles in accordance with manufacturer's instructions.

.2 Clean tiles in accordance with manufacturer's instructions.

3.6 **PROTECTION**

.1 Protect playground safety surfacing tiles from foot traffic for a minimum of 12 hours after installation.

.2 Protect completed tiles from damage during construction.

END OF SECTION

PART 1 - GENERAL

1.1 WORK INCLUDED

.1 Supply and install black vinyl clad galvanized steel chain link fencing and gates where indicated on drawings.

.1 Provide 1200mm high chain link fence with single gate as indicated on Site Plan.

.2 Gates shall be PVC coated, supplied with galvanized malleable iron hinges, latch and latch catch and hasp for padlock. Provide single gates, 900mm wide in fence at Kindergarten Play Area as shown on drawings.

.3 Refer to Architectural Site Plan.

.2 Work includes all chain link fencing, posts, miscellaneous hardware, outriggers, accessories and concrete footings as detailed or required for a complete installation of chain link fencing.

1.2 RELATED WORK

.1	Construction fencing	Section 01 56 00
.2	Concrete	Section 03 30 00
.3	Vehicle gates	Section 05 52 00
.4	Grading	Section 31 22 00
.5	Topsoil	Section 32 91 00
.6	Sodding	Section 32 92 23

1.3 REFERENCES

.1 ASTM International:

.1	ASTM A53M	Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated Welded and Seamless.
.2	ASTM A90M	Test Method for Weight of Coating on Zinc-Coated (Galvanized) Iron or Steel Articles.
.3	ASTM A123/A123M	Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products
.4	A153/A153M	Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware
.5	ASTM F668	Standard Specification for Polyvinyl Chloride (PVC), Polyolefin and Other Polymer-Coated Steel Chain Link Fence Fabric
.6	ASTM F934	Standard Specification for Standard Colors for Polymer-Coated Chain Link Fence Materials
.7	ASTM F1664	Standard Specification for Poly(Vinyl Chloride) (PVC) and Other Conforming Organic Polymer-Coated Steel Tension Wire Used with Chain-Link Fence
.8	ASTM F2329/F2329M	Standard Specification for Zinc Coating, Hot-Dip, Requirements for Application to Carbon and Alloy Steel Bolts, Screws, Washers, Nuts, and Special Threaded Fasteners

.2 CSA Group:
- .1 CSA-A23.1/ A23.2 Concrete Materials and Methods of Concrete Construction/ Test methods and standard practices for concrete

.3 Canadian General Standards Board:
- .1 CAN/CGSB-138.1-M Fence, Chain Link, Fabric
- .2 CAN/CGSB-138.2-M Fence, Chain Link, Framework, Zinc-Coated, Steel
- .3 CAN/CGSB-138.3-M Fence, Chain Link - Installation
- .4 CAN/CGSB-138.4-M Fence, Chain Link, Gates

1.4 **SHOP DRAWINGS**

.1 Submit shop drawings in accordance with Section 01 33 23. Shop drawings shall indicate locations of posts, all fencing materials and hardware.

PART 2 - MATERIALS

2.1 **MATERIALS - CHAINLINK FENCE**

.1 Fencing components: as indicated on drawings

.2 Concrete mixes and materials: to Section 03 30 00, Cast-in-Place Concrete, and CAN/CSA-A23.1.

.3 Chain-link fence fabric:
- .1 to CAN/CGSB-138.1 with 50mm x 6 ga. mesh, zinc treated and vinyl coated before weaving.
- .2 [Vinyl coating shall be as specified below. Gauge indicated is core wire, before coating.]
- .3 Selvedges shall be knuckled; no twisted selvedges will be accepted.

.4 Posts, braces and rails:

.1 to CAN/CGSB-138.2, hot dipped galvanized tubular schedule 40 steel pipe with black gloss finished with polyester powder coat to a minimum 5 mil thickness. Proper cleaning and preparation of the materials prior to finishing is required.

- .1 End and straining posts: 90mm O.D.
- .2 Line posts: 60mm O.D.
- .3 Rails and braces: 43mm O.D.
- .4 Gate frames: 43mm O.D.

.5 Tie wire fasteners: single strand, vinyl coated steel wire conforming to requirements of fence fabric, 6 gauge.

.6 Tension bar: minimum 5 x 20mm, black gloss polyester powder coated galvanized steel.

.7 Tension bands: minimum 3 x 20mm, black gloss polyester powder coated galvanized steel.

.8 Fittings and hardware:
.1 To CAN/CGSB-138.2, cast aluminum alloy, galvanized steel or malleable or ductile cast iron.
.2 Post caps to provide waterproof fit, to fasten securely over posts and to carry top rail.
.3 Hot dipped galvanized and black gloss polyester powder coated.

.9 Grounding Rod: 16mm diameter x 3000mm long, copper well rod

2.2 **FINISHES**

.1 Galvanizing:

.1 For chain link fabric: to CAN/CGSB-138.1 Grade 2.

.2 For pipe: 550 g/m2 minimum to ASTM A90.

.3 For other fittings: to CAN/CSA-G164.

.2 Vinyl Coated Fencing:

.1 All wire mesh fabric, fasteners, and fittings shall be finished with black vinyl coating, 0.25 mm dry film thickness, in accordance with ASTM 668 Class 2B, fused and bonded. Vinyl coating shall be continuously bonded to the galvanized wire, under pressure, before the wire is woven into fabric.

.2 All posts, braces, rails, tension bands, tension bars and other framing shall have black gloss finished with polyester powder coat to a minimum 5 mil thickness.

.3 Refer to drawings to confirm locations of fencing.

2.3 **GATES - CHAIN LINK FENCE**

.1 Fabricate gates with electronically welded joints; hot dip galvanize after fabrication.

.2 Fasten fabric to gates, with knuckled selvage at top and bottom.

.3 Provide galvanized malleable iron hinges, latch and latch catch and hasp for padlock.

2.4 **CONCRETE**

.1 Concrete mixes and materials to conform to Section 03 30 00, Cast-in-Place Concrete, and CAN/CSA-A23.1.

PART 3 - EXECUTION

3.1 **ERECTION OF CHAINLINK FENCE**

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

.2 Excavate post holes to dimensions indicated.

.3 Space line posts maximum 3000mm apart, measured parallel to ground surface.

.4 Install end posts at ends and corners of fence, and at gates. End posts and gate posts adjacent to walls of the building or storage bunkers, shall be installed such that the gap between the posts and the walls is not more than 75mm.

.5 If distance between end or corner posts exceeds 150 metres, provide straining posts equally spaced at maximum 150m o.c. Install additional straining posts at sharp changes in grade.

.6 Place concrete in post holes and embed posts into concrete to depths indicated. Ensure that concrete is not above ground level. Brace to hold posts in plumb position and true to alignment and elevation until concrete has set. Concrete for bases shall be 20 Mpa concrete at 28 days in accordance with Division 3 of these specifications. Bases shall be 300mm diameter x 1.2m deep, with top sloped away from post. Concrete bases for fence at Play Area may be minimum 250mm diameter.

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

.8 Install brace between end posts and nearest line posts; gate posts and nearest line posts; and on both sides of corner and straining posts. Braces to be placed in centre of panel, parallel to grade.

.9 Install top and bottom rails between posts and fasten securely to posts and secure waterproof caps.

.10 Lay out fence fabric. Stretch tightly to tension recommended by manufacturer and fasten to end, corner, gate and straining posts with tension bar secured to post with tension bar bands spaced at 300mm intervals. Knuckled selvedges are required at top and bottom.

.11 Secure fabric to top rails, line posts and bottom rail with tie wires at maximum 450mm intervals. Give tie wires minimum two twists.

.12 Nuts and Bolts for fittings shall be installed with the head on the exposed side of the fence. Bolts shall be peened over to prevent removal of the nut.

.13 Clean fence and touch up finishes at completion of installation.

3.2 **GATE INSTALLATION**

.1 Swing gateposts shall be installed in accordance with ASTM F 567. Direction of swing shall be as indicated on drawings.

.2 Gates shall be plumb in the closed position having a bottom clearance of maximum 75 mm. Hinge and latch offset opening space shall be no greater than 75 mm in the closed position.

.3 Determine position of centre gate rest for double gate. Cast gate rest in concrete. Concrete to be sloped to drain water.

.4 Provide spring loaded casters, as specified above, on each section of gate that exceeds 1220mm in width.

3.3 **ELECTRICAL GROUNDING**

.1 Grounding shall be installed by a licensed electrician.

3.4 **CLEAN UP**

.1 The area shall be left clean, neat and free of any debris resulting from the fence installation. Dispose of surplus material off site.

.2 Clean fences at completion of installation. Touch up any damaged galvanizing with zinc rich coating specified above.

.3 Touch up paint work as required and to the satisfaction of the Consultant.

END OF SECTION

PART 1 - GENERAL

1.1 DESCRIPTION

.1 This section specifies the supply and installation of site furnishings.

1.2 RELATED WORKS

.1	Cast-In-Place Concrete	Section 03 30 00
.2	Grading	Section 31 22 00
.3	Asphalt Paving	Section 32 12 16

PART 2 - PRODUCTS

2.1 MATERIALS

.1 Triple hoop:

.1 Henderson GA 102, each panel top be different primary colour; Red, yellow, blue. Max height to 1500mm Above FF. Install as per manufacturer's instructions.

.2 Mud Kitchen:

.1 Nature's Instruments, N1-Pg-507-01.03. Kindergarten Height (610 mm). Install as per manufacturer's instructions.

.3 Creative Panel:

.1 Nature’s Instruments, NI-PG-30X-01, 4"x4" cedar posts chalk surface. Install as per manufacturer’s instructions.

.4 Horizontal Log Border

.1 Nature’s Instruments, NI-PG-605-02-hardwood, 300mm dia.

.2 Mitre logs as per Site Plan drawings.

.3 Install as per manufacturer’s instructions.

PART 3 - EXECUTION

3.1 INSTALLATION

.1 Installation locations as indicated on drawings.

.2 Install all products as per manufacturer’s specifications. Ensure all furnishings are installed level.

.3 Touch up all finished surfaces according to manufacturer’s specifications, as required.

.4 Install creative panel, triple hoop, and umbrella, in concrete, using sonotube forms, minimum 1.2m deep, top of concrete to be 50 mm minimum below finished grade.

END OF SECTION

PART 1 - GENERAL

1.1 SCOPE OF WORK

.1 All areas of site indicated as sod are to be prepared with topsoil, graded and fertilized, and finished with first quality sod. Sod is to be watered and maintained until ready for first mowing, and mowed as detailed below.

.2 Newly sodded areas are required to be protected with temporary fencing, at the Contractor's expense, until the time of acceptance; refer to Section 01 56 00, Temporary Barriers and Controls.

1.2 RELATED WORK

.1	Temporary fencing of sodded areas	Section 01 56 00
.2	Grading	Section 31 22 00

1.3 SOURCE QUALITY CONTROL

.1 Obtain approval from Consultant of source of sod.

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

1.4 SCHEDULING

.1 Schedule sod laying to closely follow topsoil operations.

1.5 WARRANTY

.1 Warrant sodded areas for a period covering two full growing seasons from the date of final acceptance and or the date of Substantial Performance of the Contract, whichever comes later.

PART 2 - MATERIALS

2.1 MATERIALS

.1	Nursery sod:	Number one Kentucky Bluegrass sod, nursery grown solely from seed of cultivars of Kentucky Bluegrass with a minimum mixture of 3 Kentucky Bluegrass cultivars. All sod to conform to Canadian Standards for Nursery Stock, latest edition.
.2	Topsoil:	As required.
.3	Water:	potable.
.4	Herbicide:	type, rate, and method of application as approved by Owner.
.5	Fertilizer:	complete, synthetic, slow release fertilizer with maximum 35% water soluble solution.

.6 Wooden Pegs: Used for pegging sod on steep slopes shall be hardwood pegs, minimum 230mm long and approximately 25mm x 25mm square, or approved equal. In all cases, pegs shall be of sufficient length to ensure satisfactory anchorage of the sod.

PART 3 - EXECUTION

3.1 GENERAL

.1 Prior to laying of sod, submit the following to the Consultant:
- .1 Test results for the composition of top soil
- .2 Written confirmation of the depth of top soil
- .3 Written confirmation of the composition of the sod that is being used
- .4 Written confirmation that the sod has been fertilized
- .5 Survey indicating finished grades

.2 Do not proceed with laying of sod until in receipt of written acceptance of the grading and top soil from the Consultant.

3.2 CUTTING, HANDLING AND STORAGE

.1 Sod shall be cut by approved methods in accordance with recommendations of the Nursery Sod Growers Association of Ontario. In addition it shall be cut in pieces, approximately one (1) square metre in area with the soil portion having a minimum of 20mm.

.2 Sod shall be rolled or folded prior to lifting in such a manner as to prevent tearing or breaking.

.3 Sod shall be protected during transportation to prevent drying out and shall arrive at the site in a fresh and healthy condition.

.4 Sod shall be installed immediately after arrival. If there is any delay in installation the sod shall be kept moist and cool at all times until installation.

.5 All commercial fertilizer shall be packed in standard containers, clearly marked with the name of the manufacturer, weight and analysis.

.6 Fertilizer shall be stored in a weatherproof storage place and in such a manner that it will stay dry and its effectiveness is not impaired.

3.3 LAYING OF SOD

.1 All rough grading, filling, spreading of topsoil and fine grading and other preparation work required, shall be executed and completed as described in the appropriate sections of these specifications.

.2 The specified fertilizer shall be applied to and well worked into the topsoil by discing, raking or harrowing, at the rate specified. This shall be done 48 hours before laying sod.

.3 The finished surface shall be smooth, firm against footprints, with a fine, loose texture before sod is placed.

.4 Sodding operations shall take place during suitable weather conditions and on ground which is free from frost, snow and water. Sod shall be laid as soon as possible after delivery to prevent deterioration. Sod shall be laid closely knit together in such a manner that no open joints are visible, or pieces are overlapping. Sod shall be laid smooth and flush with adjoining grass areas and paving and top surface of curbs unless shown otherwise on the drawings.

.5 On any slopes of 4.1 and steeper, sod shall be laid perpendicular to the slope, and every row shall be pegged with wooden pegs at intervals of not more than 600mm. Pegs shall be driven flush with sod. For drainage swales place 5 pegs per square metre.

.6 After installation of sod, the area shall be watered immediately with sufficient amounts to saturate the sod and upper 100mm of soil.

.7 After sod and soil has dried sufficiently to prevent damage, the area shall be rolled with a roller providing 680kg pressure per square metre, to ensure a good bond between sod and soil and to remove minor depressions and irregularities.

3.4 **PROTECTION**

.1 Provide temporary chainlink fencing around all newly laid sod areas until vigorous, hardy, even growth is established, and to time of acceptance as specified below.

.2 Temporary fencing is specified in Section 01 56 00, Temporary Barriers and Controls.

.3 Remove fencing completely once sod is established, and accepted by the Owner. Repair any areas impacted by the fencing.

3.5 **MAINTENANCE**

.1 Maintenance for sodded areas shall begin immediately after sod has been installed and shall continue until the date of acceptance.

.2 Water sodded areas in sufficient quantities and at frequency required to maintain soil under sod continuously moist to depth of 75mm to 100mm.

.3 Cut grass when required to maintain a maximum height of 65mm. Not more than 1/3 of blade shall be cut at any one mowing. Edges of sodded areas shall be neatly trimmed and hand clipped where necessary. Heavy clippings shall be removed immediately after mowing and trimming. Cut minimum of two (2) times.

.4 Maintain sodded areas weed free by mechanical or chemical means, using locally accepted integrated pest management practices. When herbicides are used they shall be applied in accordance with manufacturer's recommendations. Any damage resulting from Contractor's use of herbicides shall be remedied at his expense. Herbicides are not to be used where prohibited by local bylaws.

.5 Fertilize sodded areas one month after sodding with 2:1:1 ratio fertilizer. Spread fertilizer evenly at rate of 0.5 kg of nitrogen/100m2 and water well.

.6 Erosion occurring as a result of faulty workmanship and/or materials on the part of the Contractor shall be repaired at his expense.

.7 Any sodded areas which show deterioration or bare spots shall be repaired immediately.

3.6 **ACCEPTANCE**

.1 Sodded areas will be accepted when:

.1 Sodded areas are properly established and are in a vigorous growing condition.

.2 Sod is free of bare and dead spots and without weeds.

.3 No surface soil is visible when grass has been cut to height of 50mm.

.4 Sodded areas have been cut minimum two times.

.2 Areas sodded in fall will be accepted in following spring, one month after start of growing season, provided acceptance conditions are fulfilled.

END OF SECTION