TECHNICAL SPECIFICATIONS FOR :

PROJECT: # ACCESSIBILITY RENOVATION TO BURNHAMTHORPE PUBLIC SCHOOL

CLIENT: PEEL DISTRICT SCHOOL BOARD

PROJECT No.: 26105

DATE: MAY 29, 2026

BINDER: A ARCHITECTURAL & STRUCTURAL

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SET NUMBER

PROJECT NAME

Board Tender Number: RFQMA 26-5368
Accessibility Renovation – Burnhamthorpe Public School
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END OF SECTION

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Part 1 General

1.1 PRECEDENCE

.1 This Section contains Articles prepared which represent the Owner standards and policies. In all cases this Section is intended to be read in conjunction with and to coordinate with all other Sections. In the case of discrepancy between this Section and other Sections to more stringent Articles of any applicable Section shall apply.

1.2 CONTRACT

.1 Construct the Work under a single, lump sum, Stipulated Contract. The form of Contract is the *Stipulated Price Contract, Standard Document PDSB, Rev. 2020* attached to these specifications referred to in these specifications as the '*Contract*'.

.2 Contract includes the construction of a new elevator addition including (2) two new washrooms and associated interior and site renovations.

.3 Project Occupancy Requirements

.1 It is the requirement of this Contract that the Addition & Renovation to Allan A Martin Public School, which is to be contracted and completed under the terms of this contract, be Substantially Complete and fit for full legal occupancy as stated on the attached Peel District School Board Invitation to Tender.

.4 Cautionary Note

.1 Bidders, both General Contractors and Subcontractors, are cautioned that they should not submit bids or tenders if they are unsure of their ability to comply with the above stated construction/occupancy schedule and requirements, provide overtime work as necessary and/or are unwilling to be bound by the schedule and Provisions described in these documents.

1.3 RELATIONS OF TRADES

.1 The Contract Specifications have been generally divided into trade sections for the purpose of ready reference.

.2 The Contractor is responsible for coordinating all trades. He is solely responsible for determining the lines of demarcation between Contractor and/or trades. Neither the Consultant nor the Owner, assumes 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 as properly and sufficiently specified and will be part of the Work.

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1.4 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.

1.5 EXISTING SITE CONDITIONS

.1 Work area shall be graded to blend with existing property lines to maintain drainage patterns to existing systems or systems as altered. Refer to grading drawings, survey and site plans and note requirements for additional grading, removals, parking and driveways remediation and service connections and reinstatement for areas beyond property lines and coordinate requirements for Permits, fees, deposits, etc.

.2 At the outset of the contract and before any other work begins, the contractor shall review grades on site to confirm compliance with the contract documents. Failure to do so at this initial stage shall eliminate the contractor's right to make claim regarding incorrect grades or site surface conditions at any later stage for the work.

.3 Contractor is responsible to quantify all on-site material to achieve design grades and is responsible for the importation or exportation of material from the site as required.

.4 Ascertaining the specific site and building conditions as they relate to the project is the responsibility of the contractor. Notwithstanding this overriding responsibility the consultant has made every effort to properly represent existing site conditions as they are evident at the time of tender.

.5 The Contractor shall assume the work site based on the existing conditions as shown on the drawings and visible on the job site at the time of the closing of the tender. All excavation, stockpiling, removal, importing and/or grading of soils is to be included in the work of this Contract. Refer to site plan drawings. The contractor shall also refer to the recommendations of the soils investigation records which are included for information, and report any discrepancies to the consultant prior to submitting a tender.

.6 Inspection of the site during the tender period is mandatory for all Contractors. In addition, Peel District School Board Invitation to Tender for the time of a *conducted* mandatory contractors' site tour.

.7 Minor adjustments to the level of sodded areas, berms, etc., may be permitted, to the prior approval of the Consultant and owner. It must be stressed that it will be the contractor's responsibility to negotiate and obtain approval for any such changes with the Authorities having Jurisdiction over lot grading approvals for this project. Completion delays due to such approvals shall not be entertained.

1.6 ADDITION AND RENOVATION TO AN EXISTING OCCUPIED BUILDING

.1 Refer also to *Section 01 35 23 – 'Site Safety Protocol for Occupied Buildings'*.

.2 The contractor is reminded that work to these projects shall begin during the months of the active school year. Access restrictions to portions of the work apply and are outlined within this section under Construction Sequencing. Therefore, precise scheduling and

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sequencing of the various work areas is required as addressed herein. Refer also to drawings for locations as described.

.3 At all times it is the Owner of the school who is the authority responsible for the well-being of the school occupants. As such, the Contractor's Site Superintendent must establish a working rapport with the Owner or his/her designee, suitable to provide daily notification of proposed construction timing and activities.

.4 During the occupied school year absolutely no contracting personnel are allowed in the school building during operating hours other than in those work areas designated within this Section under Construction Sequencing, or by express permission of the Owner and under the direct supervision of the Contractor's Site Superintendent.

.5 During the school year, the General Contractor shall designate a full-time flag person to control construction traffic access and egress to any construction access points and at times as stipulated in articles in this Section and elsewhere in these specifications. Costs for compliance to execute work under these terms is to be carried by all trades as part of the base contract price.

.6 Connection of any services must be made after hours and in such a way that it leaves no disturbance to materials or systems, nor any exposed construction conditions within the operating school area.

.7 The General Contractor shall maintain construction fencing and hoarding and through access to fire routes at all times.

.8 Catering trucks are not permitted on the school site whatsoever.

.9 During the school year, the Contractor shall minimize nuisances to the school operation such as loud noise, percussion sounds from power tools, dust, odours. Due to noxious fumes, roofing and asphalt paving shall be done after hours (after 4:00 p.m., or during the weekends). Hot asphalt kettles may not be heated until after 4:00 p.m. on weekdays without prior permission from the school Owner and Owner Project Manager.

.10 *Refer also to Section 01 52 00- 'Construction Facilities' and Section 01 56 00- 'Temporary Barriers and Enclosures'*

1.7 CONSTRUCTION SEQUENCING

.1 Basic Scope outline

Interior renovations to various areas of the school including main office, library and various classrooms to add a two storey internal elevator, universal toilet room and barrier free washrooms.

.1 Complete selective demolition as described on drawings and specifications
.2 Construct renovations to all interior areas of the school as described in drawings and specifications.
.3 Complete renovations to existing areas and site works such that the work is Fit for Occupancy/Substantially Performed by the required date for occupancy in the Contract.

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.4 Following Substantial Performance complete deficiencies to renovations to the existing building such that project Total Completion is achieved by the required date

.2 Coordinate sequencing with all trades and advise sub-trades of these sequencing requirements prior to the close of Tenders.

.3 Ensure that door replacement throughout school is done in a manner to not leave existing rooms unlocked and unsecure. Contractor to remove and replace doors sequentially.

1.8 CONTRACTOR PARKING

.1 Refer to section 01 52 00 Construction Facilities.

1.9 BYLAWS, PERMITS AND APPROVALS

.1 Nothing indicated on the Drawings or Specifications is intended to be in conflict with any law, by-law or regulation of Municipal, Provincial, or similar Authority Having Jurisdiction.

.2 Work of this Contract must conform with such laws, by-laws and/or regulations. Any required variation to, or deviation from, the drawings and specifications, shall be performed in accordance with the Contract contained in these specifications.

.3 Furnish inspection certificates and/or permits as may be applicable as evidence that the installed Work conforms with laws, by-laws and regulations of Authorities Having Jurisdiction.

.4 Each subtrade shall obtain and pay for all permits and licenses required by Municipal, Provincial, or other authorities having Jurisdiction, particular to their trade.

.5 It is the final responsibility of the General Contractor to obtain all the required approvals and permits and include in his Total Stipulated Price, the cost of such approvals, permits and fees. The only exception is the Building Permit, which will be applied for by the Consultant and paid for by the Owner. It is the contractor's responsibility include in the base tender amount any additional permit or connection fees not specifically identified in the Cash Allowance, and to provide any deposits or securities required by Authorities Having Jurisdiction.

.6 Any revisions or deviations to Contract Documents required by any Authorities Having Jurisdiction must be reviewed by the Consultants before implementation.

1.10 ORGANIZATION

.1 Organize the Work of each section as required for satisfactory and expeditious completion of the Work. Take field dimensions required for the Work. Fabricate and install work to suit field dimensions and conditions.

.2 If applicable, take into account existing work to ensure best arrangements of components in available space. Contact the Consultant prior to commencing Work in critical locations and interface with other Contractors' Work.

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.3 Provide all forms, templates, anchors, sleeves, inserts and accessories required to be installed in the Work. Set in place, or instruct the applicable subtrade as to their location. Pay costs of extra work, if required, as a result of a failure to comply with these requirements at the proper time.

.4 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 effects his own work, and the General Contractor shall promptly notify the Consultant IN WRITING, if any condition exists that will prevent any Subcontractor from giving a satisfactory result in his own work.

.5 Should any 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.

1.11 CANADIAN PRODUCTS AND LOCAL LABOUR

.1 To the extent that the same are available and consistent with the proper economy and expeditious completion of the Contract, Canadian equipment, materials, products and other such applicable items are preferred by the Owner to be used in the Work, wherever possible and practical.

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

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

.5 All Contractors will do 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.

.6 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.

.7 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.

.8 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.

.9 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.

.10 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.

.11 Lay out mechanical and 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.

.12 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.

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

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

1.13 QUALITY CONTROL

.1 Refer also to Section 01 45 00.

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

.3 The General 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.

.4 If the General Contract 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.

.5 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 General 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.

.6 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 General

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 General Contractor shall pay all associated costs for retesting and reinspection.

.7 The General 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.)

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

.9 The General 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.

.10 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 Consultant.

.1 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 pleasure and convenience of the Owner, but within the first year of the warranty period.

1.14 OVERTIME AND OVERTIME SCHEDULING

.1 The General Contractor must include in his Total Stipulated Tender Price, all costs for overtime work which may be necessary to complete the various portions of the Work, in accordance with the Completion Dates specified in the *Stipulated Price Bid Form.* The Owner shall not entertain requests for any payments in connection with overtime work that may be required by the General Contractor, or any of his subtrades, in order to comply with the above referenced dates.

.2 Similarly, it is the Contractor's responsibility to ensure, prior to the close of tenders that all subtrades will meet the requirements for overtime, as required, with no additional costs to the owner, in order to meet the Completion Dates specified in the Form of Tender.

.3 The contractor shall recognize the critical importance that the schedule for full occupancy must be met by the dates stated in the *Stipulated Price Bid Form*. Note that local by-laws may be enforced restricting morning and evening and Sunday work hours.

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.4 Note that at no time will the Owner entertain additional charges or claims from the General Contractor or his subcontractors for premium, overtime or after–hours work.

.5 Only claims for scope changes or conditions beyond the control of the Contractor may be submitted for review by the Consultants and must be submitted and accepted in advance of the work taking place and at the outset of the condition or scope change arising. No claims additional charges or delays will be accepted if not reviewed and formally accepted in advance.

.6 Notwithstanding sentence 5 above, for any work that remains incomplete after school occupancy by students on September 4, 2015, all access and work shall be restricted to after hours only: i.e.: after 4:00 p.m. and before 7:00 a.m.. No additional costs for overtime or after hours work shall apply.

1.15 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 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.

1.16 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.

1.17 SUPPLY AND INSTALL

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

1.18 OCCUPATION BEFORE COMPLETION

.1 If the General Contractor, for any reason, does not have the Project completed by the specified 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.

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1.19 GENERAL REQUIREMENTS

.1 All Contractors 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 Contractors shall co-operate and co-ordinate their work for the proper completion of the work, including co-ordination of delivery dates and commencement of subtrades work.

.3 The responsibility and costs for all work, including temporary structures, shoring, shoring design (if applicable) and erection shall at all times rest with the General 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 General Contractor.

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

.5 The General Contractor shall be fully responsible for coordinating 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.

1.20 COORDINATION

.1 The General Contractor shall coordinate all work and preparation on which subsequent work depends to facilitate mutual progress, and to prevent any conflict.

.2 The General Contractor shall ensure that each trade makes known, for the information of the General 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.

.3 The General Contractor shall ensure that each trade, before commencing work, knows the requirements for subsequent work and that each trade is assisted in the execution of its preparatory work by trades whose work depends upon it.

.4 The General Contractor shall ensure that shop and layout drawings, templates, and 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 cooperative location and installation by other trades and that such information is communicated to the applicable installer.

.5 The General Contractor shall ensure that delivery of materials supplied by one trade to be installed by another is well before the installation begins.

.6 The General Contractor shall inform all trades that giving installation information in error, or too late to incorporate in the work, shall be responsible for any extra work

caused thereby, unless impractical and where required, cutting shall be done by each respective trade, and patching shall be done by the general contractor.

1.21 ACCESS TO THE PROJECT

.1 The General Contractor for this Work shall, at all times allow the Consultants, the Owner, or any other Owner commissioned contractor or their employees, access into 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 The General Contractor shall cooperate fully with any and all Owner commissioned Contractors.

1.22 SUBTRADE AWARDS

.1 The Contractor shall, on notice of award of the contract, obtain the Consultants 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. The General Contractor 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 specified in Divisions 26 and 33.

1.23 SAFETY DATA SHEETS

.1 The General Contractor shall ensure that the following material and safety data sheets are submitted prior to commencing installation and application of at least the following:

.1 Lead-free solder
.2 Resilient flooring
.3 Painting and finishing
.4 Fertilizers
.5 Glues and adhesives
.6 Pesticides
.7 Herbicides
.8 Any other product which may give off air borne particles after installation.
.9 Sealants and caulking

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

.3 Contractor The General 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.

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.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 General Contractor with his authorized stamp/signature.

.7 The Completion Security Account will not be paid to the Contractor without submission of all required affidavits and requested material and safety data sheets.

1.24 REGULATING DOCUMENTS

.1 The General Contractor and all of his Subcontractors, Suppliers/Installers etc., must conform to the latest editions in force at the time of tender of each and all of the following: Ontario Building Code, Canadian Electrical Code (CEC), The Occupational Health and Safety Act, Ontario, the National Fire Code, the local Municipal Fire Code, and all other applicable Codes and Building By-Laws. All must also 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 hoarding, scaffolding and shoring, 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. The General Contractor and all of his Subcontractors, Suppliers/Installers must meet or exceed the requirements of specified standards.

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

1.25 SITE SUPERINTENDENTS AND PROJECT MANAGERS

.1 It is the requirement under the work to this Contract that the Contractor provide on-site, full-time, *Site Superintendent* for the entire project duration through to the end of Deficiency completion. Superintendent shall have qualifications of previous experience with similar projects. Superintendent shall remain assigned full time to the project until completion of all deficiencies. This is a base bid requirement and the Contractor shall include this cost in the Tender Amount.

1.26 GENERAL CONTRACTOR'S RESPONSIBILITIES

.1 The list of General 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 General Contractor and is reproduced only as a reminder. The Consultants and the Owner advise the General 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.

.1 The General 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.

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

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

.4 The General Contractor shall comply with, and shall ensure that all of his Subcontractors, Suppliers, Installers etc., comply with all Federal, Provincial and Municipal Safety Codes and Regulations and the Occupational Health and Safety Act.

.5 The General Contractor shall supply competent personnel to implement his safety program and ensure that all Subcontractors comply with the Owner's standards, and those of the Occupational Health and Safety Act.

.6 The Owner will provide 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 canceled and the General Contractor removed from the site.

.7 The Owner may hire Commissioners to perform inspections of building systems at the closing stages of the work of this contract. If so contracted and identified in the *Instructions to Bidders*, the General Contractor shall cooperate with and coordinate the work of the Owner's Commissioners on site.

.8 The General Contractor will 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 General Contractor's or any of his Subcontractors' execution of the work.

.9 The General Contractor will include all provisions of this contract in any agreement with Subcontractors, and hold them equally responsible for safe work performance.

.10 If the General 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 sole opinion of the Owner's Representative and Consultant, to avoid delay in the final completion of the work or any operations thereof.

1.27 MANUFACTURERS' INSTRUCTIONS

.1 Unless otherwise specified, the General Contractor and all his Subcontractors shall comply with manufacturer's latest printed instructions for materials and installation methods.

.2 The General Contractor shall notify the Consultant in writing of any conflict between the Specifications and Manufacturer's Instructions and have same clarified.

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1.28 AIR AND VAPOUR SEAL

.1 The General Contractor shall 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.

1.29 FIRE SAFETY

.1 The General Contractor and all of his Subcontractors must comply with requirements of standard for Building Construction Operations, issued by the Fire Commissioner of Canada.

.2 The appropriate clauses of the Ontario Building Code relating to fire protection shall be strictly followed.

.3 The General Contractor shall provide and maintain free access to temporary or permanent fire hydrants acceptable to local fire department.

1.30 CONSTRUCTION SAFETY

.1 Refer also to *Section 01 35 23 – 'Site Safety Protocol for Occupied Buildings'*

.2 The General Contractor and all his trades must observe and enforce construction safety measures required by Canadian Construction Safety Code, Workplace Safety & Insurance Owner, and Municipal statutes. In particular, the Ontario Construction Safety Act, the regulations of the Ontario Department of Labour and Ontario Hydro Safety Requirements shall be strictly enforced. In event of conflict between any provisions of above authorities the most stringent provisions will apply.

.3 The General Contractor is reminded, once again, that it is he who 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.

.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, health working environment by providing the education necessary to perform these activities or duties safely.

.5 The Owner is vitally interested in the health and safety of all Contractors and their workers performing work for the Owner. Cooperation and support of the General Contractor in the protection of workers from injury or occupational disease is a major, continuing object of the Owner. To achieve these goals, the Owner, in concert with the Contractors, will endeavor 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.

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.6 The General 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, including without limitation, Bill 208 (the "Act") in connection with all work performed by either the Contractor, Subcontractors, or any Other Contractor on, or in connection with, the Project.

.7 Without limiting the foregoing, for the purposes of this Contract, the General Contractor agrees that they 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 General Contractor, Subcontractors and Other Contractors on or in connection with the Project.

.8 The General 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 (hereinafter collectively referred to as the "Owner") 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 General Contractor shall assume all liability and responsibility in connection with same.

.9 The General 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 defense 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 General 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 General Contractor of any of its covenants, agreements and obligations under this Contract.

.10 The General 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 General 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.

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

.12 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.

.13 The General 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 General Contractor. The Contract Price must include the General Contractor's fees for the coordination and supervision of the work of all Other Contractors.

.14 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.

.15 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.

.16 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 General Contractor, in their entirety, throughout the duration of the construction project.

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

.18 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 General 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 Owner's Representative, who shall copy and inform the Owner's Supervisor of Health and Safety and/or the Owner's Joint Health and Safety Committee, containing such information and particulars as may be described.

.19 Where a person is killed or critically injured from any cause at the work place, the General Contractor shall immediately call the Ministry of Labour. A written notice from the General 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 Architect and the Owner's Representative.

.20 The General 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.

1.31 INDEPENDENT TESTS AND INSPECTIONS

.1 The Contractor shall appoint inspection firms as directed by the 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.

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.4 Mill tests and certificates of compliance.

.5 Re-testing as already described in *Quality Control* of this Section.

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

.3 The General 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.

.4 The General Contractor shall notify Inspection Firms sufficiently in advance of operations to allow for assignment of laboratory personnel and scheduling of test.

.5 Where materials are specified to be tested, the General Contractor shall deliver representative samples in required quantity to testing laboratory.

1.32 PERIODIC CLEANING

.1 Refer also to Section 01 74 11.

.2 As part of the Tender, the General Contractor shall provide all necessary garbage bins through the duration of the project. The General Contractor shall ensure that the following is accomplished:

.1 Keep all areas of the Work clean and orderly, free from accumulation of dirt, debris, garbage, oily rags, excess material, or such other trash items. Remove such items for all areas of the Work on a daily basis.

.2 Vacuum and/or broom interior building areas when ready to receive painting and other finishes. Continue cleaning on an “as needed” basis until the building is ready for inspection and takeover.

.3 Schedule cleaning operations so that resulting dust and other contaminants do not affect wet, newly painted surfaces.

.4 In preparation for Substantial Performance and Occupancy, conduct inspections of all exposed interior and exterior surfaces.

.5 Remove grease, dust, dirt, stains, labels, fingerprints, and other foreign materials from all exposed interior and exterior finishes, including glass and other polished surfaces.

.6 Remove all protective film from switch plates and hardware, particular kick plates.

.7 Clean lighting reflectors, lenses and other lighting surfaces.

.8 Broom clean paved surfaces and rake clean other disturbed surfaces in the area of the Work, to remove site debris caused by the Work of this Contract. Inspect for damages and make good.

.9 Remove debris and surplus materials from the roof areas and accessible concealed spaces.

□

.10 Replace heating, ventilation and/or air conditioning filters through the entire building to the extent that they supply or return from the work areas, whether or not, the units were operated during construction operations.

.11 Refer to "cleaning" sections of the specifications for additional specific periodic and final clean up requirements.

.3 The General Contractor must note the Owner insists that tiled (VCT) and sheet good floors (vinyl or linoleum) be broom swept only. Wet mopping and waxing/polishing will be done by the Owner's Caretaking Staff.

.4 Do not provide sealants and waxes on terrazzo, ceramic and other hard surfaced floors without reviewing products and methods of application with the Owner's Caretaking Staff. Failure to comply with this requirement will result in the contractor stripping these floors in their entirety.

.5 The contractor shall also ensure that the appropriate measures including a stone mud mat are installed and maintained at all construction entrances, to avoid contamination of City roads and sewers. It is the Contractor's responsibility and not the Owner's to ensure that site entrances and roadways in front of the site are maintained in clean condition acceptable to the municipality or Subdivision Engineer, as the case may be for un-assumed subdivisions.

.6 The contractor shall inspect the existing elevator sump pump on a weekly basis for the duration of construction. The sump pump is located within the construction hoarding area.

1.33 TEMPORARY PROTECTION

.1 Refer also to Articles 1.8, in this Section.

.2 The General Contractor to provide temporary dustproof and fire resistant barricades, screens or barriers to separate all work areas from other parts of the building and/or as directed by the Consultant and/or authorized Owner Representative, for the safety of persons, or for dividing the Work from portion or portions of the building or site that may be required for use by the school, or others.

.3 Properly protect the Work from any damage by the elements. In cold weather cover all exterior openings in the work areas likely to cause water damage.

.4 During off hours and/or stages of suspended operations for whatever reasons, the General Contractor must assume all responsibility for protection against the elements, theft and/or vandalism. This applies to all work in progress and to any materials, products, tools, equipment, or other such items left at the work site.

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

.6 The General Contractor must keep floors free of oils, grease or other such materials likely to discolour them and/or affect bonding of applied surfaces.

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.7 The General Contractor must 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.

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

.9 The General Contractor must provide and maintain, in good working order, appropriately labeled ULC fire extinguishers, to the approval of Authorities Having Jurisdiction.

.10 The General Contractor must provide a minimum of two safety helmets on site at all times for the use of the Consultant and any other Owner authorized visitors to the site. It is the General 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.

1.34 COMPLETION

.1 Upon completion of the Work, all protection erected shall be removed, all damage to the Work and adjoining Work due to the lack or failure of such protection shall be made good and 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 Staff. The General Contractor shall give written notice to the Consultant, requesting final inspection of the completed Project.

.2 Refer to the pertinent sections of the Specifications for requirements with respect to submission of *Record Documents, Maintenance Materials, Special Tools* and *Spare Parts.*

1.35 GUARANTEES

.1 Refer to individual specifications sections for additional information on warrantees. In the event an extended warranty is listed in the specific Section, that section will have precedence over this list. If no extended warranty is listed, this list will govern:

.1	Entire Building, General Contract	1
.2	Finish Carpentry	2
.3	Caulking	2
.4	Finish Hardware	3
.5	Panic Devices and Door Closers	5
.6	Acoustic Ceilings	2
.7	Built Up Roofing (installation)	2
.8	Built Up Roofing (manufacturer's)	10
.9	Concrete Floors	3
.10	Ceramic Tile	5
.11	Painting (OPCA warranty)	2
.12	Resilient Tile	3

□

.2 The guarantee period shall start on the date of issue of the Certificate of Substantial Performance of the Contract by the Consultant.

1.36 CONTINGENCY ALLOWANCE

.1 Include in the Tender Amount a Contingency Allowance in the amount of **one hundred and fifteen thousand dollars, ($115,000.00) not including HST.**

.2 Expend Contingency Allowance as directed by the Consultant, in writing, in accordance with the Contract

.3 Contractor's charges for expenses and profit on Contingency Allowance expenditure shall not be included in Contract Price. Refer to the Contract and Supplementary Conditions for percentages of mark-ups.

.4 Such charges shall be added to the net trade cost of each expenditure from the Contingency Allowance at the percentage rates noted in the PDSB Stipulated Price Contract rev. 2020.

.5 *Changes to the Work shall be added to, or deducted from, the Contingency Allowance, not from the Owner approved Contract. The Contract shall be adjusted by Owner approval, only once - at the end of the Project.* Credit the Contract with any unused portion of the Contingency Allowance only in the final payment statement.

1.37 CASH ALLOWANCES

.1 Include in the Contract Price, a Cash Allowance in the amount of **sixty-five thousand dollars, ($65,000.00) not including HST.**

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

.3 The Contract Price, *and not the Cash Allowance*, includes the General Contractor's profit and coordination costs in connection with all Cash Allowance expenditures.

.4 The Contract Price will be adjusted by written order by the Consultant to provide for an excess or deficit to each Cash Allowance. Any unused portions of these allowances shall be returned to the Owner on the conclusion of the Contract.

.5 A schedule shall be prepared jointly by the Consultant and the General Contractor to show when items called for under Cash Allowances, so that the progress of the Work is not delayed.

.6 Exclusive of Deposits, which are the contractor's sole responsibility to provide as required of Authorities Having Jurisdiction, the following is a summary of the scope Cash Allowances to be included in the contract:

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.7 Expend both Cash Allowances as directed by the 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 Cash Allowance Breakdown of Items

.1 Testing and Inspections (requested by Consultant, Owner or imposed by Authorities)

.2 Interior signage (supply and installation)

.3 PA/Telephone System Supply and Install (addition requirements requested by Board in addition to what is included in base contract)

.4 Computer Components System (rough-ins included in base contract)

.5 Preparation of digital as-built drawings (if completed by the Consultants)

1.38 ALLOWANCES CARRIED IN DIVISIONS 15 AND 16

.1 No Additional Cash Allowances are included in the work of Divisions 15 and 16.

1.39 SCHEDULE OF ALLOWANCES

.1 Material Allowances shall include the following:

.1 Net cost of Material

.2 Applicable taxes and duties

.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 (i.e. contract co-ordination)

.5 Overhead and profit

.3 Material and Installation Allowances shall include the following:

.1 Net cost of material

.2 Applicable taxes and duties

.3 Deliver to site

.4 Handling at site, including unloading, uncrating, storage and hoisting

.5 Labour, installation and finishing

1.40 POLYCHLORINATED BIPHENYL (PCB)

.1 Conform to the Environmental Protection Act and Regulations, Ontario Regulation 11/82 as amended.

1.41 USE OF CONSULTANTS'S DIGITAL DRAWINGS

.1 Where a contractor wishes to obtain a digital copy of consultant drawings for shop drawings or survey purposes, the consultant may elect to provide this drawing for a

nominal fee. As this is the consultants' option, the contractor shall not anticipate provision of these digital drawings to meet the contract schedule.

1.42 BUILDING DIMENSIONS

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

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

.3 Check and verify all dimensions referring to the work and the interfacing of all services. Verify all dimensions, with the trade concerned when pertaining to the work of other trades. Be responsible to see that Subcontractors for various trades co-operate for the proper performance of the Work.

.4 Avoid scaling directly from the drawings. If there is ambiguity or lack of information, immediately inform the Consultant. Be responsible for any change through the disregarding of this clause.

.5 All details and measurements of any work which is to fit or to conform with work installed shall be taken at the building.

.6 Advise Consultant of discrepancies and if there are omissions on drawings, including layout of items which affect aesthetics, or which interfere with services, equipment or surfaces. DO NOT PROCEED without direction from the Consultant.

.7 Prepare interference drawings AND SUBMIT AS SHOP DRAWINGS IN ADVANCE OF PRODUCTION to properly co-ordinate the work in all ceiling spaces and where necessary. Coordinate these drawings with all Divisions. Refer also to Section 013300.

1.43 SETTING OF WORK AND REQUIRED SURVEYS

.1 As part of the base tender amount, provide and pay for the services of a Land Surveyor acceptable to the Consultant, registered in the Province of Ontario to establish the property boundaries and the location of the building addition.

.2 Lay out building lines for the work and provide substantial stakes, batter Owners or monuments to preserve lines and levels.

.3 Verify on the site all grades, lines, levels, dimensions and location of hydrants, existing structures, manholes, overhead and buried utilities, existing trees, roadways, sidewalks and the like, shown on the drawings, and report omissions, errors, or inconsistencies, before commencing work.

.4 Upon completion of layout work and before commencement of any excavation, give ample notification to allow for inspection of lines and levels. Such inspection does not in any way mitigate the Contractor's responsibility for accuracy of layout.

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.5 Provide the consultant with a Surveyor's Certificate describing the location of all perimeter foundation walls relative to property lines before construction proceeds on those walls.

1.44 LAYOUT OF WORK

.1 Layout work with respect to the work of all trades. Arrange mechanical and electrical work such as piping, ducts, conduits, panels, equipment and the like to suit the architectural and structural details.

.2 Alterations necessary due to conflict and interference between trades, to be executed at no cost to the Owner unless notification is given in writing before Tender Closing Date.

1.45 DOCUMENTS REQUIRED AT START, DURING & CLOSE-OUT OF CONSTRUCTION

.1 At Commencement of Contract

.1 Supply Performance Bond and Labour and Material Bond, in accordance with Section 00 21 13, Instructions to Bidders.

.2 Supply Public Liability and Property Damage Insurance Certificates, also Builder's Risk and Boiler Insurance as required of the Contract.

.3 Supply Certificates of good standing from WSIB for the General Contractor and all Subcontractors.

.4 Supply a complete Contract Sum Breakdown of all subtrades or parts of work and general expense items for approval by all consultants. Include Mechanical and Electrical Breakdowns for review and acceptance by Consultants.

.5 Supply a competent detailed Construction Schedule that has been reviewed and approved by major subtrades. Identify critical milestone dates for Renovations.

.6 Supply Cash Flow schedule of monthly progress payments in coordination with the Construction Schedule and plot as 'S' curve chart.

.7 Supply Schedule of Shop Drawing Submissions and identify list of long-lead items.

.8 Apply for and post and supply a copy of Notice of Project.

.9 Supply a copy of Health & Safety policy as well as post at the job site.

.10 Supply Shoring Designs of all load bearing areas if any required of the construction sequence or if required by the Structural Engineer.

.11 Supply interference drawings for all areas requested by the Architect, Mechanical Engineer or Electrical Engineer.

.2 During Construction

.1 Maintain as-built record drawings in clean condition.

.2 Organize regular Trade Coordination meetings.

.3 Organize separate, regular Owner and Consultant Job Meetings in accordance with Section 012200.

.4 Maintain a copy of up to date records on site including, but not limited to Permit Sets, Contract Documents updated with all addenda, all Changes and Supplementary Instructions issued by Consultants.

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.3 Monthly with Each Progress Payment Application

.1 Supply Monthly Progress Reports and Construction Schedule in accordance with Section 012200.

.2 Adjust Allowances, as required.

.3 Current WSIB Form

.4 Confirm that payments are being made to subcontractors and suppliers by submission of original copies of the current versions of Statutory Declarations with the second and subsequent Progress Payment Application. Include both Statutory Declarations Form CCDC-9A for the General Contractor and CCDC-9B from subcontractors with each monthly Progress Payment Application. No payment will be made for unincorporated material on the site, unless Bill of Sale in proper format is provided.

.4 Prior to Substantial Completion

.1 Provide detailed Completion Schedule a minimum of 90 days prior to Substantial Completion. Schedule to illustrate all trades and sequences required for completion and legal occupancy. Issue to Consultants and upon acceptance, to all trades.

.2 Coordinate Completion Schedule with Building Commissioner at least 60 days prior to substantial completion or as directed by Consultant.

.3 Prior and as a requirement of owner acceptance of Substantial Completion of the work the following to be observed, executed and submitted:

.1 DEFICIENCIES ARE LISTED: prior to Substantial Completion, the contractor shall prepare a room by room deficiency list in electronic format on an MS Excel spreadsheet provided by the Consultant. Contractor shall print and review on site with consultants at a site meeting and post on each room or area. Contractor shall reissue back to Consultant, when updated, in Excel electronic format. This list will be acted upon by all trades and coordinated and updated weekly as a minimum by the General Contractor to ensure all deficiencies are addressed by the date required for Total Performance. Confirm in writing to the Architect when and on what dates each deficiency has been completed in a satisfactory manner. The Consultant's site review will be final approval.

.2 Acceptable preliminary submissions of all Mechanical and Electrical Operations and Maintenance Manuals have been reviewed by Consultants.

.3 Acceptable preliminary submissions of all Warranty and Shop Drawing Records have been reviewed by Consultants.

.4 All final clean-up to have been executed, as specified in Section 01 74 11.

.5 Complete preliminary balancing and provide preliminary Balancing Reports.

.4 Failure to comply with these requirements shall have amounts withheld on Progress Payments and delay issuance of Certificate of Substantial Completion.

.5 Note that Prior to the Release of Holdback, a similar Progress Claim is required, and must include current Statutory Declaration Forms CCDC-9A for the General Contractor and CCDC-9B from subcontractors updated to refer to the Previous Certificate of Payment.

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.5 Upon Completion (Refer also to 01 78 00 Close-Out Submittals)

.1 Upon completion of work before the Final Certificate of Payment is issued, the following to be observed, executed and submitted:

.2 DEFICIENCIES ARE COMPLETE. Confirm in writing to the Architect when and on what dates each deficiency has been completed in a satisfactory manner. The Consultant's site review will be final approval.

.3 Finishing Hardware, Inspection and Verification. Note requirements for qualified installation and inspection in Section 08 71 10- Door Hardware.

.4 Organize a Final Inspection tour at which to be present: the Owner's authorized representative; the Architectural, Structural, Mechanical and Electrical Consultants, and their supervisory personnel, if any; the Contractor and his superintendent.

.5 Where the above procedure is impossible or where any deficiencies remain outstanding, the Owner's representative and the Consultant concerned, to inspect and accept the affected work and/or material upon notification by the Contractor, that all deficiencies involving this Consultant have been made good.

.6 A complete release of all liens arising out of this Contract, other than his own. If a subcontractor or supplier refuses to furnish a release of such a lien, furnish a bond satisfactory to the Owner to indemnify him against any claim under such a lien.

.7 Certificates of good standing from the WSIB, for the General Contractor and all Subcontractors.

.8 All reference records, as specified, under Section 01 78 00.

.9 Certificate of Inspection from Mechanical and Electrical Engineers.

.10 Copies of all Lists of Deficiencies with each Deficiency verified when complete by only this project's job Superintendent. The Final List of Deficiencies to be signed, completed by all concerned, if accepted.

.11 Statement of Completion from General Contractor.

.12 Final adjustment of all Allowances.

.13 Certificates required by Provincial, Municipal and other authorities having jurisdiction. Including signed Building Permit.

.14 2 sets of marked up prints of complete Architectural, Structural, Mechanical and Electrical drawings in addition to the digital copies required below.

.15 Digital copy of Site Services, Architectural, Structural, Mechanical and Electrical and 2 sets As-Built Drawings

.16 Final copies of all Maintenance Manuals.

Part 2 Products

2.1 NOT USED

.1 Not used.

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Part 3 Execution

3.1 NOT USED

.1 Not used.

END OF SECTION

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Part 1 General

1.1 PROJECT MEETINGS FOR COORDINATION

.1 In consultation with the Consultant not later than the second week of construction, arrange for site meetings weekly or every 2 weeks as appropriate to the stage of construction, for project coordination. Such meetings shall fall at the same time each week the meeting is scheduled.

.2 Responsible representatives of the Contractor's and Subcontractor's office and field forces and suppliers shall be obliged to attend.

.3 Inform the Owner, Consultant, and those others whose attendance is obligatory, of the date of each meeting, in sufficient time to ensure their attendance.

.4 Provide physical space for meetings, prepare an agenda, chair and record the minutes of each meeting. Relevant information must be made available to all concerned, in order that problems to be discussed may be expeditiously resolved. Identify "action by: _____".

.5 Within three days after each meeting, distribute two copies of the minutes to each invited person.

1.2 PRECONSTRUCTION MEETING

.1 Refer to *Section 01 35 23 – 'Site Safety Protocol for Occupied Buildings"* for additional measures and items in addition to this section.

.2 Refer to *Section 01 11 00 – "General Instructions and Summary of Work", article – 'Demolition and Construction Scheduling and Sequencing"* for additional measures and items in addition to this section.

.3 Within 5 days after award of Contract, request a meeting of parties in contract to discuss and resolve administrative procedures and responsibilities.

.4 Include in the agenda the following:

.1 Appointment of official representative of participants in the Work.
.2 Scheduling of Work. Schedule to include a detailed breakdown of mechanical and electrical works.
.3 Interference with ongoing business.
.4 Work by other Contractors.
.5 Schedule of submission of shop drawings and samples.
.6 Requirements for temporary facilities, site sign, offices, storage sheds utilities.
.7 Delivery schedule of specified equipment.
.8 Site security.

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.9 Contemplated change notices, change orders, procedures, approvals required, mark-up percentages permitted, time extensions, overtime, administrative requirements.

.10 Record drawings.

.11 Maintenance manuals.

.12 Take-over procedures, acceptance, warranties.

.13 Monthly progress claims, administrative procedures, photographs, holdbacks.

.14 Appointments of inspection and testing agencies or firms.

.15 Insurances, transcript of policies.

.16 Schedule for progress meetings.

.17 The Architect will issue a sample agenda and minutes; the contractor will record and issue minutes within 5 days after the meeting.

1.3 PROJECT MEETINGS FOR PROGRESS OF WORK

.1 Conduct progress meetings in accordance with the schedule and/or decisions made at Preconstruction meeting.

.2 Inform the Owner, Consultant, project consultants, Subcontractors and suppliers and those whose attendance is obligatory, of the date of the meeting, in sufficient time to ensure their attendance.

.3 Include in the agenda the following:

.1 Review, approval of minutes of previous meeting.

.2 Review of Work progress since previous meeting.

.3 Field observations, problems, conflicts.

.4 Problems which impede construction schedule.

.5 Review of off-site fabrication delivery schedules.

.6 Corrective measures and procedures to regain projected schedule.

.7 Revisions to construction schedule.

.8 Progress during succeeding work period.

.9 Review submittal schedules: expedite as required.

.10 Maintenance of quality standards.

.11 Pending changes and substitutions.

.12 Review proposed changes for effect on construction schedule and on completion date.

.13 Other business.

1.4 PROGRESS RECORDS

.1 Maintain a permanent written record on the site of the progress of the work using standard OGCA form. This record shall be available to the Consultant at the site, and a copy shall be furnished to same on request. The record shall contain:

.1 Daily weather conditions, including maximum and minimum temperatures.

.2 Dates of the commencement and completion of stage or portion of the work of

each trade in each area of the project.

.3 Conditions encountered during excavation.

.4 Dates of erection and removal of formwork, in each area of the project.

.5 Dates of pouring the concrete in each area of the project, with quantity and Particulars of the concrete.

.6 Work force on project daily per trade and active hours.

.7 Visits to site by personnel of Consultant, Jurisdictional Authorities and testing companies.

.8 Review records with Architect at the Architect's periodic site visit and fax to his/her office.

1.5 PROGRESS REPORTS

.1 Submit to the Architect, Monthly Progress Reports consisting of a concise narrative and a marked-up summary schedule showing physical percentage complete by item and in total. These progress calculations must agree with the Progress Payment Claims.

1.6 DIGITAL CONSTRUCTION SCHEDULES

.1 At the outset of the project, General Contractor to provide and maintain a digital project schedule including Milestone Dates and listing all trades.

.2 Update and issue to Consultant in hard copy and electronic copy not less than monthly and at each Progress Draw. To be issued in format compatible with Microsoft Project program.

.3 At 70% completion of Project, develop a detailed Completion Schedule outlining final coordination and sequences to completion.

1.7 DOCUMENTS REQUIRED AT START, DURING & CLOSE-OUT OF CONSTRUCTION

.1 At Commencement of Contract

.1 Supply Performance Bond and Labour and Material Bond, including Bonds required for Mechanical and Electrical sub-contractors in accordance with Section 00 21 13, Instructions to Bidders.

.2 Supply Public Liability and Property Damage Insurance Certificates, also Builder's Risk and Boiler Insurance as required of the Contract.

.3 Supply Certificates of good standing from WSIB for the General Contractor and all Subcontractors.

.4 Supply a complete Contract Sum Breakdown, of all subtrades or parts of work and general expense items for approval by all consultants. Include Mechanical and Electrical Breakdowns for review and acceptance by Consultants. Consultant will assist with division of Allowances.

.5 Required for Pre-Construction meeting: Supply a competent detailed Construction Schedule, in electronic and printed form, that has been reviewed and approved by major subtrades. Identify critical milestone dates ("critical path"). Electronic Form shall be updated against baseline original schedule.

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.6 Supply a forecast Cash Flow Schedule, showing values of monthly progress to illustrate work volume to achieve Substantial Completion and Total Performance dates.

.7 Supply Schedule of Shop Drawing Submissions.

.8 Apply for and post and supply a copy of Notice of Projects.

.9 Supply a copy of Health & Safety policy as well as post at the job site.

.10 Supply Shoring Designs for Demolition Areas of all load bearing areas if so required or requested by the Structural Engineer.

.11 Supply Method Statements for all areas involving demolition of load bearing walls, for all areas requested by Architect or the Structural Engineer.

.12 Supply interference drawings for all areas requested by the Architect, Mechanical Engineer or Electrical Engineer.

.2 During Construction

.1 Maintain as-built record drawings in clean condition.

.2 Organize regular Trade Coordination meetings and take minutes. Have minutes available for review on site by consultant.

.3 Organize separate, regular Owner and Consultant Job Meetings in accordance with this Section.

.4 Maintain a copy of up to date records on site including, but not limited to Permit Sets, Contract Documents updated with all addenda, all Changes and Supplementary Instructions issued by Consultants, inspections by Authorities and their remarks, Inspection and Testing company reports and filed reviews.

.3 Monthly with Each Progress Payment Application

.1 Supply Monthly Progress Reports and Construction Schedule in accordance with Section 012200, Meetings and Progress Reports.

.2 Updated Cash Flow Schedule.

.3 Updated Construction Schedule, showing baseline and actual progress.

.4 Adjust Allowances, as required.

.5 Current WSIB Form

.6 Confirm that payments are being made to subcontractors and suppliers by submission of original copies of the current versions of Statutory Declarations with the second and subsequent Progress Payment Application. Include both Statutory Declarations Form CCDC-9A for the General Contractor and CCDC-9B from subcontractors with each monthly Progress Payment Application. No payment will be made for unincorporated material on the site, unless Bill of Sale in proper format is provided.

.4 Prior to Substantial Completion and to achieve Substantial Completion

.1 Refer also to Section 01 78 00 – '*Close-out Submittals'*.

.2 Prior to Substantial Completion of the work the following to be observed, executed and submitted:

.3 DEFICIENCIES ARE LISTED: prior to Substantial Completion, the contractor shall prepare a room by room deficiency list in electronic format (template to be supplied by the Consultant), print and review on site with consultants at a site

meeting and post on each room or area. This list will be acted upon by all trades and coordinated and updated weekly as a minimum by the General Contractor to ensure all deficiencies are addressed by the date required for Total Performance. Confirm in writing to the Architect when and on what dates each deficiency has been completed in a satisfactory manner. The Consultant's site review will be final approval.

.4 Acceptable preliminary submissions of all Mechanical and Electrical Operations and Maintenance Manuals have been reviewed by Consultants.

.5 Acceptable preliminary submissions (90% complete) of all Warranty and Shop Drawing Records have been reviewed by Consultants.

.6 All final clean-up to have been executed, as specified in Section 017411, Cleaning.

.7 Preliminary Balancing Reports.

.8 Failure to comply with these requirements shall have amounts withheld on Progress Payments and delay issuance of Certificate of Substantial Completion.

.9 Note that Prior to the Release of Holdback, a similar Progress Claim is required, and must include current Statutory Declaration Forms CCDC-9A for the General Contractor and CCDC-9B from all major subcontractors/suppliers, updated to refer to the Previous Certificate of Payment.

.5 Upon Completion

.1 Upon completion of work before the Final Certificate of Payment is issued, the following to be observed, executed and submitted:

.2 DEFICIENCIES ARE COMPLETE. Confirm in writing to the Architect when and on what dates each deficiency has been completed in a satisfactory manner. The Consultant's site review will be final approval. **Refer to required timelines below**.

.3 Finishing Hardware, Inspection and Verification. Note requirements for qualified installation and inspection in Section 087110- Door Hardware. Inspection only is paid for from Cash Allowances.

.4 Organize a Final Inspection tour at which to be present: the Owner's authorized representative; the Architectural, Structural, Mechanical and Electrical Consultants, and their supervisory personnel, if any; the Contractor and his superintendent.

.5 Where the above procedure is impossible or where any deficiencies remain outstanding, the Owner's representative and the Consultant concerned, to inspect and accept the affected work and/or material upon notification by the Contractor, that all deficiencies involving this Consultant have been made good.

.6 A complete release of all liens arising out of this Contract, other than his own. If a subcontractor or supplier refuses to furnish a release of such a lien, furnish a bond satisfactory to the Owner to indemnify him against any claim under such a lien.

.7 Certificates of good standing from the WSIB, for the General Contractor and all Subcontractors.

.8 All reference records, as specified, under *Section 17800, Close Out Submittals*

.9 Certificate of Inspection from Mechanical and Electrical Engineers.

□

.10 Copies of all Lists of Deficiencies with each Deficiency verified when complete by only this project's job Superintendent. The Final List of Deficiencies to be signed, completed by all concerned, if accepted.

.11 Statement of Completion from General Contractor.

.12 Final adjustment of all Allowances.

.13 Certificates required by Provincial, Municipal and other authorities having jurisdiction. Including signed Building Permit.

.14 Final Balancing Reports showing completed adjustments

.15 Digital copy of Architectural, Mechanical and electrical and 1 set of manual As-Built Drawings.

.16 As-Built Survey by O.L.S. (2 copies and diskette)

.17 Final copies of all Maintenance manuals.

.6 **Requirement for Completion of Deficiencies**.

.1 The owner requires that following Substantial Completion that the date for Total Completion including all deficiencies is respected.

.2 Should deficiencies remain beyond the required date for Total Completion, the owner and consultant may engage other contractors to complete the work and deduct the costs from the Completion Security Account plus administrative costs. At all times the Contractor must communicate with Consultant on his schedule of activities and he must perform supervision and coordination of the completion of all deficiencies, regardless of subtrade performance.

Part 2 Products

2.1 NOT USED

.1 Not used.

Part 3 Execution

3.1 NOT USED

.1 Not used.

END OF SECTION

□

Part 1 General

1.1 SECTION INCLUDES

.1 Shop drawings and product data.

.2 Samples.

1.2 SHOP DRAWINGS

.1 Submit to Architect, for review, shop drawings, product data and samples specified.

.2 Until submission is reviewed, work involving relevant product must not proceed.

1.3 RELATED SECTIONS

.1 Section 011100 – Summary of Work.

1.4 REFERENCES

.1 Stipulated Price Contract for Peel District School Board

1.5 SHOP DRAWINGS AND PRODUCT DATA

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

.2 Drawings to be originals prepared by Contractor, Subcontractor, Supplier or Distributor, which illustrate appropriate portion of work; showing fabrication, layout, setting or erection details as specified in appropriate Sections.

.3 Identify details by reference to sheet and detail numbers shown on Contract Drawings.

.4 If sheet size exceeds 11” x 17” to a maximum sheet size 606 x 909 mm then one set of reproducible transparencies plus opaque prints shall be submitted for copying.

1.6 PROJECT 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 Above will only be accepted if they conform to 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 Show wiring diagrams (when requested) and controls.

1.7 COORDINATION OF SUBMISSIONS

.1 Review shop drawings, product data and samples prior to submission.

.2 Verify:

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

.3 Co-ordinate each submission with requirement of work and Contract documents. Individual shop drawings will not be reviewed until all related drawings are available.

.4 Contractor's responsibility for errors and omissions in submission is not relieved by Architect's review of submittals.

.5 Contractor's responsibility for deviations in submission from requirements of Contract documents is not relieved by Architect's review of submission, unless Architect gives written acceptance of specified deviations.

.6 Notify Architect, in writing at time of submission, of deviations from requirements of Contract documents.

.7 After Architect's review, distribute copies.

1.8 SUBMISSION REQUIREMENTS

.1 Schedule submissions at least fourteen (14) days before dates that reviewed submissions will be required to be returned.

.2 Submit one reproducible transparency, plus six (6) opaque “white prints” of shop drawings, product data to Architect for review.

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

.1 Date.
.2 Project title and number.
.3 Contractor's name and address.
.4 Number of each shop drawing, product data and sample submitted.
.5 Other pertinent data.

.4 Submissions must include:

.1 Date and revision dates.
.2 Project title and number.
.3 Name of:
  .1 Contractor.
  .2 Subcontractor.
  .3 Supplier.

.4 Manufacturer.

.5 Separate detailer when pertinent.

.5 Identification of product or material:

.1 Relation to adjacent structure or materials.

.2 Field dimensions, clearly identified as such.

.3 Specification Section number.

.4 Applicable standards, such as CSA or CGSB numbers.

.5 Contractor's stamp, initialed or signed, certifying review of submission, verification of field measurements and compliance with Contract documents.

1.9 INTERFERENCE DRAWINGS

.1 Prepare interference drawings for all work in confined space: ceiling space. Coordinate with all trades. Submit as shop drawings in advance of fabrication or installation of components. Site conditions requiring corrections, due to failure to provide interference drawings as required will be corrected at no additional cost to the owner.

1.10 SHORING DESIGN DRAWINGS

.1 As part of the base bid price, the contractor shall provide in advance of any demolition work of or adjacent to any load-bearing building components, detailed Shoring design drawings bearing the seal of a Professional engineer registered in the Province of Ontario and also a Method Statement describing the work sequence and timing/duration of each stage.

.2 Submit to the Consultants as shop drawings in advance of the work. Discuss and update as required and at all regular job site meetings.

.3 Recognize that shoring design may be required for both dead and live load conditions adjacent to occupied areas. Shoring shall be designed to avoid interruptions in the use of the occupied areas.

.4 Costs for shoring and design as required above shall be included in the Tender price.

1.11 SHOP DRAWINGS BEARING THE SEAL OF A PROFESSIONAL ENGINEERS

.1 In addition to any the similar requirements for shop drawings of any mechanical or electrical systems, Shop Drawings for all structural components or components required to perform in conjunction with other structural or building envelope components, cladding and the like shall bear the seal of a professional engineer licensed in the Province of Ontario.

.2 In addition, all components to be attached to or suspended from the walls and ceiling areas shall also bear the seal of a professional engineer licensed in the Province of Ontario.

1.12 SUBMISSIONS TO INSPECTION AGENCIES

.1 Note that Millwork shop drawings are also to be submitted to AWMAC as part of the Guarantee Inspection program.

.2 Note that Paint formulations specified are also to be submitted to the OPCA with set up documentation upon award of Contract.

Part 2 Products

2.1 NOT USED

.1 Not Used.

Part 3 Execution

3.1 NOT USED

.1 Not Used.

END OF SECTION

Part 1 General

1.1 DESCRIPTION

.1 This Section outlines the mandatory minimum Health and Safety protocols for all renovation, addition and new school construction Projects where all or a portion of the existing school building remains occupied and in use.

.2 These Health and Safety protocols are mandatory minimum requirements, procedures and standards that the Peel District School Board insists are fully complied with by all parties involved with Peel District School Board Projects.

.3 **All aspects of this section apply for periods when the school is occupied and/or for all work that extends beyond September 1, 2025**.

1.2 RELATED SECTIONS

.1 These specifications apply to all Divisions of this Project specification. It is the responsibility of the Contractor to apply these provisions wherever practical within specification limits to all products and services used on this Project.

.2 The requirements of this Section supersede those of all other specification Sections and Drawings. Where conflicts exist in procedures, methods or materials, they shall immediately be brought to the attention of the Consultant and Board Project Manager. Where clarification is not immediately available, the Contractor shall assume the specifications contained in this Section are a minimum standard and the more stringent specification shall apply.

.3 The Contractor must receive approval from Board Project Manager for any deviations from this specification Section.

.4 The General Contractor shall recognize that it is *he* who is the Constructor of the Project. The General Contractor shall also recognize that he is solely responsible for site safety at the Place of the Work and compliance with the requirements of this Section does not limit or remove his total responsibility for site safety as Constructor of the Project.

1.3 REFERENCES

.1 Applicable related regulations, standards and laws related to safety include but are not limited to:

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

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

.1 Material Safety Data Sheets (MSDS).

.3 Province of Ontario

1. Occupational Health and Safety Act and Regulations for Construction Projects, R.S.O. [1990 June 2002].

1.4 COMPLIANCE SPECIFICATION

.1 Notwithstanding the requirements of this Section, the Contractor must comply with all applicable health, safety and environmental regulations and statutes.

1.5 BEYOND COMPLIANCE SPECIFICATION

.1 These specifications apply in addition to all applicable health, safety and environmental compliance regulations. They are incorporated here to reflect the Board's intention to develop a specification which provides the safest practical procedures and policies for construction project sites that are occupied and in use by staff, students and visitors during the execution of the Construction Contract.

.2 Beyond compliance specifications recognize that performance well beyond the minimum regulatory standard is often desirable, possible and affordable, often with no cost or low cost options. It also recognizes that application methods or protocols may be as important as the material specified. Therefore, these specifications cover both material and methods.

.3 These provisions apply to both indoor and outdoor applications equally.

Part 2 Products

2.1 NOT USED

Part 3 Execution and Compliance Requirements

3.1 APPLICATION OF COMPLIANCE REQUIREMENTS

.1 The articles setout herein are to be applied together as a set of related policies and procedures to achieve a comprehensive Health and Safety working protocol.

.2 The Contractor shall execute all of the procedures and meet all of the requirements set out herein and apply these protocols from the outset of the Construction Phase.

.3 These procedures or requirements are to be maintained for the duration of the Construction Phase. The Contractor shall not discontinue any of the individual procedures or requirements without the prior approval of the Board Project Manager.

3.2 SITE SUPERVISOR (SITE SUPERINTENDENT)

.1 A full-time Site Supervisor (Site Superintendent) is required on site, regardless of the number of active workers on site.

.2 Site Superintendent shall have as a minimum:

.1 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.

.2 Successful completion of a multi-session Supervisor's training course conducted by a recognised Construction Association in Ontario.

.3 Site Superintendent 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.

.4 Site Superintendent must have means of live phone or walkie-talkie communication with the site Flagman during all work hours.

.5 Site Superintendent shall not be changed throughout project unless confirmed and approved by the Board Project Manager.

3.3 ONTARIO OCCUPATIONAL HEALTH & SAFETY ACT AND REGULATIONS FOR CONSTRUCTION PROJECTS

.1 General Contractor to comply with the Ontario Occupational Health & Safety Act and Regulations for Construction Projects, latest edition– including all amendments.

.2 Beyond compliance in item .1 above, regardless of the number of labourers active on the Project, the General Contractor shall form a contractors' Health & Safety Committee at the outset of construction. This Committee shall then follow the standard requirements for such a Committee as set out in the *Occupational Health & Safety Act and Regulations for Construction Projects.*

3.4 ON-SITE COMMUNICATIONS

.1 At the outset of the project the General Contractor shall provide to the Board Project Manager all relevant contact information for the Site Superintendent, GC Project Manager and key sub-contractors including names and cell phone numbers.

.2 The General Contractor shall provide at least one "emergency contact" telephone number at which the Contractor's representative can be reached directly during all work hours and have the ability to have voicemail recorded during all non-work hours including weekends and holidays. As outlined below, this may be designated to the Site Superintendent's cell phone number.

.3 Regardless of compliance method for the emergency contact telephone number stated above, the Site Superintendent 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.

.4 Site Superintendent must have means of live phone or walkie-talkie communication with the site Flagman during all work hours.

.5 The Contractor is to ensure that the Board Project Manager is immediately apprised of any safety issues as each arises and the related request and/or resolution. The Board Project Manager is responsible for any decisions that have an effect on the contract execution.

.6 Notwithstanding the reporting to the Project Manager noted above the Site Superintendent shall liaise with school principal or designate on all safety related matters as required on a daily basis.

.7 In the event of a safety issue requiring contractual clarification or action (i.e. Change Notice, etc.), the contractor shall ensure that, where applicable, the action is followed up with appropriate documentation.

3.5 FULL-TIME ON-SITE FLAGMEN

.1 A full-time, designated Flagman is required at all vehicular construction entrances.

.2 In the event there is more than one entrance to the hoarded/fenced construction area, there must be a separate Flagman for each entrance.

.3 Flagman may not be same person as Site Superintendent or other construction worker.

.4 Flagman shall not be changed throughout the Project unless confirmed and approved by the Board Project Manager.

.5 Flagman must have means of phone communication with Site Superintendent (phone or walkie-talkie).

.6 The Flagman shall not be designated for any other duties than to act as a Flagman for safety purposes as described herein.

.7 The Flagman shall meet and escort any construction traffic from the site **entrance** into and out of the hoarded/fenced construction area (including through open site areas until entrances to hoarding.

.8 The Flagman shall only open hoarded areas when construction traffic moves through and immediately re-close gates.

.9 The Flagman shall control construction parking at the school site (including vehicles parking or traveling in unauthorized areas).

.10 The location of the Flagman shall be set to ensure the safe guarding of staff, student, and pedestrian traffic.

.11 If not designated on the Contract Documents, the location of the Flagman shall be confirmed with the Board Project Manager and Consultant at the outset of the project and before the placement of hoarding and fencing.

.12 Where the Contractor deems it necessary, in order for the Flagman to carry out the required full-time duties, the cost of a temporary shelter shall be included in the Tender Price.

.13 The Flagman shall be properly attired to carry out his duties, including the use of safety equipment (e.g. wear reflective vest, have appropriate traffic hand-held "Stop" sign and have a visible identification tag).

3.6 SITE SAFETY SIGNAGE

.1 Standardised Safety Signage is required at all construction entrances.

.2 If not designated on the Contract Documents, the location of the Safety Signage shall be confirmed with the Board Project Manager and Consultant at the outset of the Project and before the placement of hoarding and fencing.

.3 Safety Signage is to be posted at all street entrances to school site and at each entrance to hoarded/fenced construction area.

.4 Total surface area of signage is to avoid exceeding municipal standards that would require a separate signage permit.

.5 Access signage text shall include cell phone contact number for Site Superintendent.

.6 Signage posted at gates shall state restrictions on hours of entry and egress as described in the Contract Documents and under no circumstances shall construction traffic be allowed within 30 minutes prior to school start, during recess, lunch break, and 30 minutes after dismissal periods.

3.7 ACCESS/EGRESS CONTROLS

.1 At the outset of the Contract, the General Contractor shall advise all suppliers and subcontractors of the protocols listed herein and of the requirement to contact the Site Superintendent by Cell phone prior to entering the site.

.2 The drivers of all construction vehicles entering the site, including delivery vehicle drivers, are to contact site Superintendent by cell phone prior to entering site; the Site Superintendent shall, in turn, give notice to the Flagman to be aware of the traffic and authorize the Flagman to allow entry of that vehicle.

.3 Vehicular Gates are only for entry and exit of for construction purposes such as construction personnel, Authorities performing inspections, Board representative, delivery personnel, and disposal pickup and ONLY under escort by the Flagman. As such vehicular gates must remain closed and locked at all times and only opened for access/egress under escort by the Flagman, then closed and locked again.

.4 Gates are to be lockable swing gates for vehicles and man gates at all access points to the hoarded/fenced construction area.

3.8 CONTRACTOR PARKING

.1 Contractor parking shall be restricted to hoarded areas or designated parking areas only where pre-approved by Board Project Manager and Principal.

.2 Contractor parking is restricted from all off-site street areas that interfere with site specific parent drop-off and parking areas.

3.9 REQUIRED PRE-CONSTRUCTION MEETINGS

.1 Meeting 1: Contractor shall receive approval from the Architect and the Board Project Manager for parking, vehicular movement, access/egress strategies at a Pre-construction meeting taking place in advance of mobilizing on site.

.2 Meeting 2: Once hoarding and fencing is erected BEFORE site construction is fully active and vehicles or equipment is mobilized on site, an initial site meeting shall take place at which time the layout of trailers and staging, deliveries, storage of materials, parking areas and vehicular movement to be reviewed and approved by the Board Project Manager.

.3 See article *3.12- 'Site Meetings'* following.

3.10 CONSTRUCTION FENCING AND HOARDING

.1 Construction hoarding requirements shall be a site based decision to be determined by the Architect and the Board Project Manager at the design stage and shown on Contract Documents.

.2 No fencing or hoarding shall be less than a continuous 1800 mm high.

.3 In portions of the site where chain link is approved, it shall be continuous 1800 mm high chain link fencing, wire-tied to staked iron 'tees' at 1800 mm on centre - OR - leased, modular 'quick fencing' if staked down and wire tied together.

.4 All fenced and hoarded areas to be gated with lockable vehicular and man gates-minimum construction to be steel rail and chain link construction.

.5 Plastic snow fencing is NOT permitted.

.6 All hoarding and fencing shall be maintained in a stable condition, for duration of construction period as part of the base contract price and to include Superintendent's inspection at the beginning and end of each work day.

.7 All Fire Routes to be outside all fenced and hoarded areas and maintained clear at all times.

.8 'Covered way' protection shall be provided when accesses or pathways are in proximity to construction, in accordance with Ministry of Labour *Occupational Health & Safety Act* Regulations.

3.11 PEEL DISTRICT SCHOOL BOARD HEALTH, WELLNESS & SAFETY DEPARTMENT REPRESENTATIVE

.1 A representative of the Board's Health, Wellness & Safety Dept. ('Environment, Health and Safety Officer') may visit site at any anytime throughout the duration of the Contract to review the site, as it relates to the safety of the occupied areas of the site. Such site review shall neither constitute an inspection or approval for the Contractor.

.2 Concerns or issues identified by the representative from the Board's Health, Wellness & Safety Dept. shall be communicated through the Board Project Manager and the school Principal for corrective action.

.3 Contractor shall ensure full access to all site areas, at all times, for the Board's Health, Wellness & Safety Department Representative.

3.12 SITE MEETINGS

.1 Coordinate the requirements of this Section with *Section 01 22 00 – 'Meetings and Progress Reports'*.

.2 Initial site meeting to take place after erecting fencing and hoarding but prior to the mobilisation of any vehicles, equipment or start of Work.

.3 Contractor shall ensure that the Board Project Manager, School Principal and a representative of the Board's Health, Wellness & Safety Department and the School Principal attend the initial site meeting.

.4 The initial meeting shall review and approve a standardised agenda for all site meetings and a thorough review of the Site Safety Protocol.

.5 The standardised agenda shall include a Checklist and Report of Health and Safety items at the beginning of the agenda. This Checklist shall be included and each item reviewed at all site meetings for the duration of the project.

.6 The Checklist of Site Safety items shall include but not be limited to:

.1 Contractor's report of site safety record and report of recent site activities, precautions or actions.

.2 Review any visits to the site and actions required by Ministry of Labour or Board Health, Wellness & Safety representatives or other Authorities Having Jurisdiction.

.3 Contractor's Health & Safety policy manual posted in site trailer.

.4 Copy of Ministry of Labour *Occupational Health & Safety Act and Regulations for Construction Projects* in site trailer.

.5 Name of General Contractor H&S representative.

.6 Continuing compliance with Safety Signage.

.7 Hoarding & fencing layout and condition.

.8 Access and egress measures and any breaches of requirements.

.9 Confirmation of communications link between Site Superintendent & Flagman.

.10 Work that may produce any noxious odours and the containment measures, (*i.e.*: schedule, type, approvals required therefore).

.11 Copies of Material Safety Data sheets in site trailer.

.12 Complete meeting minutes including details of Safety Checklist shall be copied to Architect, Board Project Manager and Principal.

.7 Contractor to produce record of written Memorandum to all subtrades and suppliers detailing but not limited to: hours of delivery; site access procedures and restrictions; use of existing facilities.

.8 Contractor to prepare detailed and accurate written record of all meetings to be kept and issued to all parties.

3.13 CONTRACTOR'S HEALTH AND SAFETY COMMITTEE MEETINGS

.1 As required in item 3.1.2, the Contractor shall form a Health and Safety Committee, hold meetings and record minutes of meetings for the duration of the Contract.

.2 Contractor to maintain a copy of Health & Safety Committee minutes on site for review by Ministry of Labour or Board representative(s).

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

.1 Health and safety considerations required to ensure that the Owner shows due diligence towards health and safety on construction sites. While the following articles do not fully detail all of the Owner's Health and Safety policies, the Contractor shall follow these guidelines for all Board construction projects as a minimum.

1.2 RELATED SECTIONS

.1 These specifications apply to all divisions of this project specification. It is the responsibility of the Contractor to apply these provisions wherever practical within specification limits to all products and services used on this project.

.2 Recognized that currently specified materials and methods may conflict with the basic intention of this section. Where reasonable alternate materials and methods exist that are not specified here, and that do not compromise quality or create additional cost for the Owner, notify the Consultant of such alternate materials or methods. Do not proceed to use alternate materials or methods to those specified without the express approval of the Consultant.

.3 Elsewhere, apply the provisions of this section to all work. Exceptions can only be made when signed off by the Consultant. Suitability of all products used is the responsibility of the Contractor.

1.3 REFERENCES

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

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

.1 Material Safety Data Sheets (MSDS).

.3 Province of Ontario

.1 Occupational Health and Safety Act and Regulations for Construction Projects, R.S.O. 1990 June 2002.

1.4 COMPLIANCE SPECIFICATION

.1 The Contractor must comply with all applicable health, safety and environmental regulations.

1.5 BEYOND COMPLIANCE SPECIFICATION

.1 These specifications apply in addition to all applicable health, safety and environmental compliance regulations. They are incorporated here to reflect the Owner's intention to develop a specification which maximizes environmentally "friendly" materials and methods wherever possible within current technical and budget limitations.

.2 Beyond compliance specifications recognize that performance well beyond the minimum regulatory standard is often desirable, possible and affordable, often with no cost or low cost options. It also recognizes that application methods or protocols may be as important as the material specified. Therefore these specifications cover both material and methods.

.3 The primary goal of beyond compliance specification is to reduce the use of products or methods which have negative health and environmental impacts both during and after construction. These considerations may include full life cycle impacts, associated with raw materials, manufacturing, transport, deconstruction and their eventual fate.

.4 These specifications will specifically address primary categories of readily identifiable products, ingredients and methods.

.5 These provisions apply to both indoor and outdoor applications equally.

1.6 HAZARDOUS MATERIALS

.1 The Ontario Health and Safety Act requires the Board 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. The Peel District School Board has arranged for the removal of readily identifiable hazardous materials that would impact on Construction, in particular, Asbestos-containing building materials (designated substance) and PCB-containing electrical equipment (non-designated substance) prior to the work of this project.

.2 Other 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 found 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; and

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

.4 Also note avoidance of other products noted below.

.5 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.

1.7 EXCEPTIONS

.1 These specifications recognize that not all substitutes are equal and therefore exceptions can be made based on substantive evidence of necessary and superior performance. Special considerations may be given to restricted substances when secondary provisions are made such as sealed in place (contained) applications. All such exceptions must be approved in writing by the Consultant.

1.8 PRODUCTS OR SUBSTANCES TO BE AVOIDED OR LIMITED IN USE

.1 No product containing the following substances may be used on this project when an equivalent product without or with a lower concentration of this substance is suitable and

available. All products containing substances which are known to cause health effects including but not limited to cancer, mutagenic, neurological, or behavioral effects should be avoided if suitable substitutes not containing or containing lower concentrations are available. This provision shall be limited to information contained on Material Safety Data Sheets, therefore MSDS sheets must be reviewed for all products for which such sheets are required. Applications for exceptions must be accompanied by related MSDS and product application and performance sheets, clearly showing a need for the exception.

1.9 VOLATILE ORGANIC COMPOUNDS

.1 No product containing volatile organic compounds (in over simplified terms volatile petro chemical or similar plant derived solvents) may be used on this project when a suitable non VOC or failing that a low VOC substitute is available. Manufacturers may refer to the U.S. EPA definition of VOC's for guidance or alternatively use the low molecular weight organic compound descriptor.

.1 Example: Paints, Coatings, Primer, Adhesives, Chalks, Firestops, etc.

.2 Waterborne equivalents are available for most of the solvent borne products used in construction and in most cases would be the preferred alternative. Waterborne products may in some instances have high VOC contents; therefore the fact that a product is waterborne does not automatically make it acceptable.

1.10 CHLORINATED SUBSTANCES

.1 Poly Vinyl Chloride (vinyl) and other chlorinated products should be avoided if suitable substitutes are available.

1.11 PLASTICIZERS

.1 Plasticizers which off-gas (low molecular weight) should be avoided.

1.12 MAN MADE MINERAL FIBRES

.1 Products containing mineral fibres which can be emitted or abraded should be avoided.

.1 Examples: duct liner, mineral fibre ceiling tiles, etc.

1.13 RADIATION

.1 Products or methods which result in the lowest emission of Electro Magnetic Fields are preferred.

1.14 BIOCIDES

.1 Products containing biocides (pesticides, miticides, mildeweides. fungicides, rodenticides, etc.) are not to be used if suitable alternatives are available. Highly stable, low human toxicity biocides such as Portercept may be acceptable substitutes. Biocide formulas which break down, emit powders of offgass should be avoided.

1.15 HEAVY METALS

.1 Heavy metals such as lead, cadmium, mercury etc. should be avoided.

1.16 ALUMINUM

.1 Raw aluminum should be avoided, anodized or factory painted aluminum is acceptable. This is particularly applicable to surfaces which people can touch.

1.17 OZONE DEPLETING SUBSTANCES

.1 Products which contain or which use Ozone Depleting Substances such as Bromide, Chlorofluorocarbons (CFC) or Hydrofluorocarbons (HFC) etc. should be avoided if suitable substitutes are available.

1.18 GREENHOUSE GASES

.1 Products which contain, use or generate Greenhouse gasses such as CO2 should be avoided if suitable substitutes are available.

1.19 BITUMINOUS (Tar) PRODUCTS

.1 Products containing tar compounds should not be used if suitable substitutes are available.

1.20 CHEMICAL COMPOUNDS

.1 Products containing the following chemical compounds should not be used if suitable substitutes are available: Neoprene, Latex, Butyl, ABS, and Formaldehyde.

1.21 ADHESIVES

.1 Adhesives containing solvents or other non preferred ingredients should be avoided if suitable substitutes are available, including systems designs which do not need adhesives or can use mechanical etc. fastening alternatives

1.22 COMPOSITE PRODUCTS

.1 Some composite products contain adhesives such as formaldehyde which are not preferred, and some composites such as Fibre Reinforced Plastics are not practical for recycling. These products should be avoided if suitable substitutes are available.

1.23 ASBESTOS

.1 Asbestos removal is NOT anticipated in the Contract.

.2 Should the Contractor encounter limited areas of asbestos (pipe joint insulation, etc.), the Contractor may be requested to engage an independent abatement company and testing and Inspection company to inspect the removal and make tests in the areas affected. If the contractor is requested to perform these duties, such costs will be reviewed in advance as possible additional work to the contract.

.3 Significant findings of unanticipated asbestos shall be considered and reviewed by the Owner and the Consultant. Costs for such removal, testing and Inspection will be paid by the owner, who may opt to pay from the Cash Allowance.

.4 Any abatement or removal of unanticipated asbestos shall be considered at the sole discretion and direction of the Owner, in consultation with the Consultant.

.5 For any areas of unforeseen asbestos, Comply with the requirements of Regulations respecting Asbestos on Construction Projects and in Buildings and Repair Operations - made under the Occupational Health and Safety Act, as amended.

.6 Comply with the requirements of the Peel Board of Education's Section 2 -Procedures General, Subsection 2.2.1-Asbestos Management Program.

1.24 POLYCHLORINATED BIPHENYL (PCB)

.1 Conform to the Environmental Protection Act and Regulations, Ontario Regulation 11/82 as amended.

1.25 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 scrapping 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 The maintenance of the water pipe may produce some exposure to lead fume during the sweating on of lead solders but for a short duration of time. Inhalation is the source of entry and exposure is not very significant

.7 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 sweating on of lead solders but for a short duration of time. Inhalation is the source of entry and exposure is not very significant.

.8 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

1.26 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 Board for disposal through commercial recyclers. The other forms (light tubes and painted surfaces that have not been concentrated) can be disposed of as regular waste.

1.27 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.

1.28 CLEANERS AND SOLVENTS

.1 Products, equipment, and methods which require the use of cleaners and solvents are not preferred if suitable substitutes are available. Examples of preferred products would include No Wax floors, or primerless caulks and adhesives, or products not requiring caulks and adhesives.

Part 2 Products

2.1 NOT USED

.1 Not used.

Part 3 Execution

3.1 NOT USED

.1 Not used.

END OF SECTION

Part 1 General

1.1 FIRES

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

1.2 DISPOSAL OF WASTES

.1 Do not bury rubbish and waste materials on site.

.2 Do not dispose of waste or volatile materials, such as mineral spirits, oil or paint thinner into waterways, storm or sanitary sewers.

1.3 DRAINAGE

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

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

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

1.4 SITE CLEARING AND PLANT PROTECTION

.1 Protect trees and plants on site and adjacent properties where indicated.

.2 Wrap in burlap, trees and shrubs adjacent to construction work, storage areas and trucking lanes, and encase with protective wood framework from grade level to height of [2] m.

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

.4 Replace trees and shrubs designated on plans with identical species of same or larger caliper.

1.5 POLLUTION CONTROL

.1 Maintain temporary erosion and pollution control features installed under this contract and as requested by local Municipal and Regional Authorities.

.2 Install, maintain, restore, replace sediment control fence as required by Municipal and Regional authorities. The fence shall be in accordance with Municipal standards.

3. Install, maintain, restore, replace catch basin sediment protection at all existing on-site and street roadside catch basins in accordance with Municipal standards.

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.3 Install, maintain, restore, replace catchbasin sediment barrier immediately after installation of new catch basins on the property in accordance with Municipal Standards.

.4 Install and maintain a mud mat at the construction access made consisting of clear stone as shown on drawings.

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

.6 Prevent sandblasting and other extraneous materials from contaminating air beyond application area, by providing temporary enclosures.

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

Part 2 Products

2.1 NOT USED

.1 Not Used.

Part 3 Execution

3.1 NOT USED

.1 Not Used.

END OF SECTION

□

Part 1 General

1.1 SECTION INCLUDES

.1 Inspection and testing, administrative and enforcement requirements.

.2 Tests and mix designs.

.3 Samples and Mock-ups.

.4 Mill tests.

.5 Equipment and system adjust and balance.

1.2 RELATED SECTIONS

.1 Section 13300 - Submittal Procedures.

.2 Section 017800 - Closeout Submittals.

.3 Section 011100 – Summary of Work

1.3 REFERENCES

.1 Stipulated Price Contract for Peel District School Board

1.4 INSPECTION

.1 General: Materials and workmanship shall be subject to inspection at any time. Cooperate in permitting access for inspection to all places where work is being done or stock is being stored.

.2 Owner's quality control inspection and testing is specified in the technical sections and will be paid from Cash Allowance except as otherwise specified. Pay for inspections and retesting to verify acceptability of corrected work.

.3 Allow Consultant access to Work. If part of Work is in preparation at locations other than Place of Work, allow access to such Work whenever it is in progress.

.4 Allow sufficient time for testing, evaluation, alterations and retesting so as not to interrupt the Progress Schedule for the Project.

.5 Give timely notice requesting inspection if Work is designated for special tests, inspections or approvals by Consultant instructions, or law of Place of Work.

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

.7 The Consultant may require testing of connections and special prefabricated inserts, as part of the work of this Section.

1.5 ACCESS TO WORK

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

.2 Co-operate to provide reasonable facilities for such access.

1.6 PROCEDURES

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

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

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

1.7 REJECTED WORK

.1 Remove defective Work, whether result of poor workmanship, use of defective products or damage and whether incorporated in Work or not, which has been rejected by Consultant as failing to conform to Contract Documents. Replace or re-execute in accordance with Contract Documents.

.2 Make good other Contractor's work damaged by such removals or replacements promptly.

1.8 TESTS AND MIX DESIGNS

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

.2 The cost of tests and mix designs beyond those called for in Contract Documents or beyond those required by law of Place of Work shall be appraised by Consultant and may be authorized as recoverable.

.3 Allow sufficient time for testing, evaluation, alterations and retesting so as not to interrupt the Progress Schedule for the Project.

.4 The Consultant may require testing of connections and special prefabricated inserts, as part of the work of this Section.

1.9 SAMPLES AND MOCK-UPS

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

.2 Construct in all locations as specified in specific specification Sections or as acceptable to the Consultant.

.3 Prepare mock-ups for Consultant's review with reasonable promptness and in an orderly sequence, so as not to cause any delay in Work.

.4 Failure to prepare mock-ups in ample time is not considered sufficient reason for an extension of Contract Time and no claim for extension by reason of such default will be allowed.

.5 If requested, Consultant will assist in preparing a schedule fixing dates for preparation.

.6 Unless through prior approval of the Consultant to incorporate an acceptable mock-up into the work, remove mock-up at conclusion of Work or when acceptable to Consultant.

1.10 MILL TESTS

.1 Submit mill test certificates as required of specification Sections.

1.11 EQUIPMENT AND SYSTEMS

.1 Submit adjustment and balancing reports for mechanical, electrical and building equipment systems.

.2 Refer to Mechanical and Electrical Sections for definitive requirements.

1.12 SEALANTS

.1 Sealants used for the various building envelope assemblies shall be selected from those specified in the respective assembly Section, and shall be coordinated with the sealant being provided under other building envelope Sections. Preferably, one sealant by the same manufacturer shall be used throughout. If different sealants are selected, from those specified, it is the responsibility of the respective Section to ensure compatibility between selected sealant, substrates, and sealants of other Sections which come in contact with the selected sealant.

Part 2 Products

2.1 NOT USED

.1 Not Used.

Part 3 Execution

3.1 NOT USED

.1 Not Used.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

.1 Section 015200 - Construction Facilities.

.2 Section 015600 - Temporary Barriers and Enclosures.

.3 Section 011100 - Summary of Work

1.2 INSTALLATION AND REMOVAL

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

.2 Remove from site all such work after use.

1.3 DEWATERING

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

1.4 WATER SUPPLY

.1 Water will be made available from the existing building services

1.5 TEMPORARY HEATING AND VENTILATION

.1 As applicable to the work period, pay for cost of temporary heat and ventilation used during construction, including costs of installation, fuel, operation, maintenance and removal of equipment. Use of direct-fired heaters discharging waste products into work areas will not be permitted unless prior approvals given by the Owner.

.2 Furnish and install temporary heat and ventilation in enclosed areas, as required to:

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

.3 Maintain minimum temperature of 10 degrees C or higher where specified as soon as finishing work is commenced and maintained until acceptance of structure by Engineer.

.4 Ventilating:

- .1 Prevent hazardous accumulations of dust, fumes, mists, vapours or gases in areas occupied during construction.

.2 Provide local exhaust ventilation to prevent harmful accumulation of hazardous substances into atmosphere of occupied areas.

.3 Dispose of exhaust materials in manner that will not result inharmful exposure to persons.

.4 Ventilate storage spaces containing hazardous or volatile materials.

.5 Ventilate temporary sanitary facilities.

.6 Continue operation of ventilation and exhaust system for time after cessation of work process to assure removal of harmful elements.

.5 Maintain strict supervision of operation of temporary heating and ventilating equipment to:

.1 Conform with applicable codes and standards.

.2 Enforce safe practices.

.3 Prevent abuse of services.

.4 Prevent damage to finishes.

.5 Vent direct -fired combustion units to outside.

.6 The Board may permit the use of a permanent system providing agreement can be reached on:

.1 Conditions of use, special equipment, protection and maintenance.

.2 Guarantees will not be affected.

.3 Approval of the Owner.

7. Refer to Section 011100, article 1.51-'Periodic Cleaning' for replacement of filters at time of final acceptance of work.

1.6 TEMPORARY COMMUNICATION FACILITIES

.1 Provide the Site Superintendent with the use of a dedicated mobile cellular for contact at all times during the contract period.

.2 In addition, provide and pay for temporary telephone/fax hook up, lines and equipment necessary for own use and use of Consultant. Fax and Telephone are to be separate lines.

1.7 FIRE PROTECTION

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

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

1.8 DRAINAGE

.1 Refer to Section 013543 for site drainage and pumping requirements.

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1.9 POWER

.1 Arrange, pay for and maintain temporary electrical power supply in accordance with governing regulations and ordinances.

.2 Install temporary facilities for power such as pole lines and underground cables to approval of local power supply authority.

.3 Existing electrical power and lighting systems and new electrical power and lighting systems installed under this Contract may be used for construction requirements with prior approval of Owner, provided that guarantees are not affected. Make good damage. Replace lamps which have been used over period of three (2) months.

.4 Basic temporary power is available from the school services. Temporary power may be routed from existing services, subject to after hours installation, access and provided no damage to existing facilities. Coordinate locations on site with consultants. Construction power shall be on independent circuits and connected at the expense of the Contractor. Power fluctuations in the school caused by construction shall not be tolerated. If this is not feasible, arrange, for and maintain separate, temporary electrical power supply in accordance with governing regulations and ordinances.

Part 2 Products

2.1 NOT USED

.1 Not Used.

Part 3 Execution

3.1 NOT USED

.1 Not Used.

END OF SECTION

□

Part 1 General

1.1 RELATED SECTIONS

.1 Section 015100 - Temporary Utilities.

.2 Section 015600 - Temporary Barriers and Enclosures.

.3 Section 011100 - Summary of Work

1.2 REFERENCES

.1 Stipulated Price Contract for Peel District School Board.

.2 Canadian General Standards Board (CGSB)

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

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

.3 Canadian Standards Association (CSA International)

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

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

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

1.3 INSTALLATION AND REMOVAL

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

.2 Remove from site all such work after use.

1.4 SCAFFOLDING

.1 All necessary scaffolding shall be provided and constructed according to all by-laws and safety regulations. It shall be removed promptly and completely when no longer required.

.2 As required by Ministry or Labour, design of scaffolding or hoarding shall be by a Professional Engineer.

1.5 ACCESS

.1 Provide and maintain adequate access to project site. Refer to Section 011100 Summary of Work and drawings for locations of access points and routes to be maintained.

.2 The General Contractor for this Work shall, at all times allow the Consultants, the Board, or any other Board commissioned contractor or their employees, access into 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.

.3 The General Contractor shall cooperate fully with any and all Board commissioned Contractors.

1.6 HOISTING

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

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

1.7 SITE STORAGE/LOADING

.1 Provide adequate weather tight sheds with raised floors, for storage of materials, tools and equipment which are subject to damage by weather.

1.8 CONSTRUCTION PARKING

.1 Refer to drawings for locations of contractor parking. While school is occupied, contractors shall be restricted to particular areas to be designated by the Board Project Manager after contract award or at such time these are required. At all times maintain full-time clear aisle access to all fire-routes. Arrange gates and fencing accordingly.

.2 Only on weekends and holidays and at times other than the regular school year, the existing parking lot is available for contractor's use. Ensure no damage to pavement or curbs.

1.9 OFFICES

.1 Due to space constraints in the existing school, make provide in the base contract amount, for an exterior site office trailer in a location to be determined by the Board Project Manager after contract award. Refer to drawings for location.

.2 Provide office heated or cooled to 22 degrees C, lighted 750 Lx and ventilated, of sufficient size to accommodate site meetings and furnished with drawing lay down table, telephone, and facsimile machine. Pay telephone not acceptable.

.3 Maintain in clean condition.

.4 Provide and maintain in clean condition: two separate plans layout tables, minimum 1200 x 1800 each. One table shall be used by the General Contractor and subcontractors at their discretion. The second shall be provided for use by subcontractors and by the consultant or Inspection and Testing Companies during site visits or project meetings.

.5 Subject to Board approval after contract award but prior to mobilization, the Board and school staff may, at their discretion, allow the contractor to utilize a room in or adjacent to the work area, provided it will not affect the area or sequence of work. Maintain in clean condition. In such case the contractor will be requested to credit price for the cost of a site trailer for the applicable duration not required.

1.10 EQUIPMENT, TOOL AND MATERIALS STORAGE

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

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

1.11 SANITARY FACILITIES

.1 Provide sanitary facilities for the work force external to the occupied building and within the hoarded area.

.2 Before the school year, at the discretion of the owner, an existing washroom in the school may be designated available for contractors' use. Use of existing washroom is subject to contractors maintaining facilities in clean and undamaged condition. Failure to comply will mean contractor shall provide other sanitary facilities outside the school.

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

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

1.12 JOBSITE SIGN

.1 Job identification sign not required.

.2 If so directed by Consultants, install and maintain consultant-provided professional identification signage or project signage at the site in location to be designated on site at no additional cost to the contract price. Return signage to consultants in undamaged condition at the end of the project.

Part 2 Products

2.1 NOT USED

.1 Not Used.

Part 3 Execution

3.1 NOT USED

.1 Not Used.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

.1 Section 011100 – Summary of Work, articles 1.8 and 1.9

.2 Section 015100 - Temporary Facilities.

.3 Section 015200 - Construction Facilities.

1.2 REFERENCES

.1 Canadian General Standards Board (CGSB)

.1 CGSB 1.189M- [84], Primer, Alkyd, Wood, Exterior.

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

.2 Canadian Standards Association (CSA International)

.1 CSA-O121- [M1978], Douglas Fir Plywood.

1.3 INSTALLATION AND REMOVAL

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

.2 Remove from site all such work after use.

1.4 HOARDING, CONSTRUCTION FENCING AND COVERED WAY PROTECTION

.1 Construct and maintain all hoarding and covered way protection at the outset of construction for the work area affected. Assign and maintain in clean condition the contractor compounds within these areas.

.2 Refer also to drawings and *Section 011100 - Summary of Work, article 1.8* for a description of required hoarding, fencing and covered way, as applicable

1.5 SITE ENCLOSURES

.1 Full site enclosure not applicable to this project.

1.6 WEATHER ENCLOSURES

.1 Provide temporary weathertight enclosures protection for exterior openings until permanently enclosed.

.2 Erect enclosures to allow access for installation of materials and working inside enclosure.

.3 Design enclosures to withstand wind pressure.

.4 Close off floor areas where walls are not finished; seal off other openings; enclose building interior work for temporary heat.

1.7 DUST TIGHT SCREENS

.1 Provide dust tight screens or [insulated] partitions to localize dust generating activities, and for protection of workers, finished areas of Work and public.

.2 Maintain and relocate protection until such work is complete.

1.8 ACCESS TO SITE

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

1.9 PUBLIC TRAFFIC FLOW

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

1.10 FIRE ROUTES

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

1.11 PROTECTION FOR OFF-SITE AND PUBLIC PROPERTY

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

.2 Be responsible for damage incurred.

1.12 PROTECTION OF BUILDING FINISHES

.1 Provide protection for finished and partially finished building finishes and equipment during performance of Work.

.2 Provide necessary screens, covers, and hoardings.

.3 Confirm with Consultant locations and installation schedule 3 days prior to installation.

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

1.13 TEMPORARY FENCING TO SODDED AREAS

.1 For areas to be re-instated and re-sodded following site service work near the elevator additions, supply and install temporary, leased 1800 high chain link fencing. Stake with iron “T’s” at minimum 2400 o.c. and maintain for a minimum of 6 weeks while sod is maintained as part of this contract and is deemed established. Sod shall be placed a **minimum** of 4 weeks prior to end of the growing season to allow for establishment of

sod prior to winter. Remove fencing at end of a 48 day (6 week minimum) ***growing*** period.

.2 Cost of fencing for this period to be included in Tender Price. If sod is placed later Contractor shall be responsible for the cost of fencing for a longer period for sod to become established, if required due to weather at no additional cost to the contract. This may include the entire winter period if sod becomes dormant prior to being established.

Part 2 Products

2.1 NOT USED

.1 Not Used.

Part 3 EXECUTION

3.1 NOT USED

.1 Not Used

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

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

.2 The responsibilities of this section includes but is not limited to the following item(s), including all related labour and materials necessary to successfully complete the installation of same as detailed on the Drawings.

.3 The cutting, removal and disposal of existing masonry wall in locations of all new electrical panels and for all mechanical ducts passing through masonry walls or walls of any other construction.

.4 The patching of existing unit masonry or gypsum board walls in locations of all new electrical or mechanical units removed from masonry walls or walls of any other construction.

.5 The cutting, removal and patching of all penetrations required for mechanical and electrical services through existing floors and ceilings and new or existing walls.

.6 The removal of existing millwork and fixtures in the existing rooms as described on drawings.

.7 The removal of existing resilient flooring and adhesive in the rooms as described on drawings that have not previously been removed by an Abatement contract.

.8 The supply and installation of backfill materials and concrete slab on grade, as specified in other sections to infill slab areas where sub-slab equipment has been removed as part of the separate Abatement contract. Refer to Drawings.

.9 The supply and installation of a Portland cement based leveling skim slab to level floors and to provide an acceptable surface for the installation of new VCT tile to any rooms as described on drawings to receive new flooring. Contractor shall anticipate this requirement for the entirety of rooms in Area A.

.10 Where not previously removed by Abatement under separate contract, the removal and repair of existing VCT and porcelain tile floors and cove base repair at modified doorway and wall locations adjacent to corridors and the removal and repair of existing floor finishes cut for under slab services. Make good to match existing using identical colour materials. Refer to drawings for locations.

.11 The removal and repair of existing terrazzo corridor floors and terrazzo cove base at modified doorway and wall locations adjacent to corridors and the removal and repair of existing floor finishes cut for under slab services. Make good to match existing using identical colour materials. Refer to drawings for locations. This work shall only be completed by a member of the TTMAC.

.12 The removal, repair and reinstallation as required to make good existing acoustic unit ceilings or gypsum board ceilings and bulkheads where required to be removed or modified for new services.

.13 Removal and reinstallation and/or salvaging as indicated, of any existing chalkboards or tackboards, window coverings and other wall mounted fixtures.

.14 All other work not listed in other Sections, but detailed on the Drawings.

1.2 RELATED SECTIONS

.1 Section 011100 - Summary of Work.

.2 Section 02 41 15 – Selective Demolition

.3 Section 042113 - Brick Masonry

.4 Section 013300 - Submittal Procedures.

.5 Section 081114- Metal Doors and Frames

.6 Section 087115 – Finish Hardware

.7 Section 099122- Painting

.8 Section 092116- Gypsum Board Assemblies

.9 Section 095113- Acoustic Panel Ceilings

.10 Section 101125- Manufactured Specialties

.11 Mechanical and Electrical Sections.

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

1.3 SUBMITTALS

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

.1 Structural integrity of any element of Project.
.2 Integrity of weather-exposed or moisture-resistant elements.
.3 Efficiency, maintenance, or safety of any operational element.
.4 Visual qualities of sight-exposed elements.
.5 Work of Owner or separate contractor.

.2 Include in request:

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

.8 Date and time work will be executed.

1.4 MATERIALS

.1 Required for original installation.

.2 Change in Materials: Submit request for substitution in accordance with Section 01 33 00 - Submittal Procedures.

.3 Concrete lintel block, reinforcing steel and concrete fill for openings if required at new penetrations in walls or existing penetrations in walls where steel lintels or lintel blocks may be missing.

.4 Portland Cement based Concrete Patching Compound compatible with existing slab or other flooring to make good a smooth, suitable surface to accept the direct application of new VCT tile.

.5 Portland Cement based Concrete for new floor openings or floor leveling, or patching of floor openings.

.6 All other materials not listed in other Sections, but detailed on the Drawings.

1.5 EXECUTION

.1 The Trades requiring cuts, holes or sleeves for their work shall locate them.

.2 Do not cut, drill or sleeve load-bearing members without obtaining prior written approval from the Consultant for each condition.

.3 Cut holes carefully, leaving holes no longer than required, with clean, true and smooth edges.

.4 Fit items to the tolerances established by Industry practice for applicable type of work.

.5 Make patches undetectable in the finished work. All other work not listed in other Sections, but detailed on the Drawings, is to be done in a Professional manner and to the Industry Standard for the described work.

.6 Execute cutting, fitting, and patching [including excavation and fill,] to complete Work.

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

.8 Uncover Work to install ill-timed Work.

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

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

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

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

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

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

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

.16 At penetration of fire rated wall, ceiling, or floor construction, completely seal voids with firestopping material, full thickness of the construction element.

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

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

Part 2 Products

2.1 NOT USED

.1 Not Used.

Part 3 Execution

3.1 NOT USED

.1 Not Used.

END OF SECTION

Part 1 General

1.1. RELATED SECTION

.1 Section 01 11 00 – General Instructions and Summary of Work.

1.2 REFERENCE STANDARDS

.1 Stipulated Price Contract for Peel District School Board

1.3 GENERAL CLEANINESS DURING CONSTRUCTION

.1 Refer also to Section 01 11 00, article -'Periodic Cleaning' and coordinate with this Section.

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

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

.4 Prevent accumulation of wastes which create hazardous conditions.

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

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

.7 Provide on-site dump containers for collection of waste materials, and rubbish.

.8 Remove waste materials, and rubbish from site.

.9 Vacuum clean interior building areas when ready to receive finish painting, and continue vacuum cleaning on an as-needed basis until building is ready for substantial completion or occupancy.

.10 Schedule cleaning operations so that resulting dust and other contaminants will not fall on wet, newly painted surfaces.

.11 Maintain project grounds, and public properties free from accumulations of waste materials and rubbish. Clean streets as often as required by the local authorities

1.4 FINAL CLEANING

.1 At completion of Work, remove waste materials, rubbish, tools, equipment, machinery, and surplus materials, and clean all surfaces exposed to view; leave project clean and ready for occupancy.

.2 Employ experienced workers, or professional cleaners, for final cleaning.

.3 Remove grease, dust, dirt, stains, labels, fingerprints, and other foreign materials from all sight-exposed interior and exterior finished surfaces; polish resilient and ceramic surfaces so designated to shine finish. Vacuum carpet.

.4 In preparation for Substantial Performance or Fitness for Occupancy status, whichever occurs first, conduct final inspection of interior and exterior surfaces exposed to view, and of concealed spaces.

.5 Clean and polish glass and mirrors.

.6 Clean all horizontal surfaces on fitments and fixtures prone to trapping constriction dust such as sills, millwork, chalkboard/tackboard frames, etc.

.7 Clean Millwork, inside and out, removing all cuttings from installation.

.8 Repair, patch and touch-up marred surfaces to specified finish, to match adjacent surfaces.

.9 Broom-clean paved surfaces; rake clean other surfaces of grounds.

.10 Clean exposed ductwork and structure.

.11 Replace filters.

.12 Clean bulbs and lamps and replace those burned out.

.13 Clean diffusers and grilles.

.14 Clean sinks, faucets, and water closets and controls.

.15 Remove snow and ice from access to building, if applicable.

.16 Maintain cleaning until project, or portion thereof, is occupied by Owner.

.17 Completely remove temporary facilities from site, including signs and foundations, making good any damage when no longer required.

Part 2 Products

2.1 NOT USED

.1 Not Used.

Part 3 Execution

3.1 NOT USED

.2 Not Used.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

.1 Section 014500 - Quality Control.

.2 Section 011100 – *Summary of Work*, article: 'Documents Required at Start, During Contract and Close Out'.

1.2 SUBMISSION

.1 Submit one copy of completed volumes in final form minimum of 15 days prior to substantial performance. For equipment put into use with Owner's permission during construction, submit Operating and Maintenance Manuals within 10 days after start-up. For items of Work delayed materially beyond date of Substantial Performance, provide updated submittal within 10 days after acceptance, listing date of acceptance as start of warranty period.

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

.3 Copy will be returned after inspection with Consultant's comments.

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

.5 Submit 2 copies of revised volumes of data in final form within 10 days after final inspection.

.6 For contract drawings (architectural, structural, mechanical, and electrical)**,** transfer neatly as-built notations onto second and third set and submit all three sets**.** Preliminary submission of all manuals is required for Substantial Completion to be issued. Submission of final manuals to the Architect is a mandatory requirement of Total Performance of the Contract.

1.3 FORMAT

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

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

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

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

.5 Arrange content under Section numbers and sequence of Table of Contents.

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

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

1.4 CONTENTS - EACH VOLUME

.1 Table of Contents: provide title of project;

.1 date of submission; names,

.2 Addresses, and telephone numbers of Consultant and Contractor with name of responsible parties;

.3 Schedule of products and systems, indexed to content of volume.

.2 For each product or system:

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

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

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

.5 Typewritten Text: as required to supplement product data. Provide logical sequence of instructions for each procedure, incorporating manufacturer's instructions.

1.5 AS-BUILTS AND SAMPLES

.1 In addition to requirements in Sections 002113 Instructions to Bidders, 011100 Summary of Work and Stipulated Price Contract-1998, maintain at the site for Owner one record copy of:

.1 Contract Drawings.

.2 Specifications.

.3 Addenda.

.4 Change Orders and other modifications to the Contract.

.5 Reviewed shop drawings, product data, and samples.

.6 Field test records.

.7 Inspection certificates.

.8 Manufacturer's certificates.

.2 Store record documents and samples in field office apart from documents used for construction. Provide files, racks, and secure storage.

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

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

.5 Keep record documents and samples available for inspection by Consultant.

1.6 RECORDING ACTUAL SITE CONDITIONS

.1 Record information on set of black line opaque drawings, and in copy of Project Manual, provided by Consultant. Refer to Division 26 and 33 for additional mechanical and electrical requirements.

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

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

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

- .1 Measured depths of elements of foundation in relation to finish first floor datum.
- .2 Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements.
- .3 Measured locations of internal utilities and appurtenances, referenced to visible and accessible features of construction.
- .4 Field changes of dimension and detail.
- .5 Changes made by change orders and Addenda
- .6 Details not on original Contract Drawings.
- .7 References to related shop drawings and modifications.

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

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

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

1.7 DIGITAL AS-BUILT DRAWINGS

.1 Retain the services of a CAD drafting company acceptable to the Consultant.

.2 Transfer to digital file all information recorded on As-Built drawings. Layering of information as per Consultant’s instructions.

.3 The Consultant will provide CAD file of contract document.

.4 The cost for preparing digital As-Built drawings will be deducted from the Cash Allowances.

1.8 EQUIPMENT AND SYSTEMS

.1 Each Item of Equipment and Each System: include description of unit or system, and component parts. Give function, normal operation characteristics, and limiting conditions. Include performance curves, with engineering data and tests, and complete nomenclature and commercial number of replaceable parts.

.2 Panel board circuit directories: provide electrical service characteristics, controls, and communications.

.3 Include installed colour coded wiring diagrams.

.4 Operating Procedures: include start-up, break-in, and routine normal operating instructions and sequences. Include regulation, control, stopping, shut-down, and emergency instructions. Include summer, winter, and any special operating instructions.

.5 Maintenance Requirements: include routine procedures and guide for trouble-shooting; disassembly, repair, and reassembly instructions; and alignment, adjusting, balancing, and checking instructions.

.6 Provide servicing and lubrication schedule, and list of lubricants required.

.7 Include manufacturer's printed operation and maintenance instructions.

.8 Include sequence of operation by controls manufacturer.

.9 Provide original manufacturer's parts list, illustrations, assembly drawings, and diagrams required for maintenance. Provide installed control diagrams by controls manufacturer.

.10 Provide Contractor's coordination drawings, with installed colour coded piping diagrams.

.11 Provide charts of valve tag numbers, with location and function of each valve, keyed to flow and control diagrams.

.12 Provide list of original manufacturer's spare parts, current prices, and recommended quantities to be maintained in storage.

.13 Include test and balancing reports as specified in Mechanical Sections.

.14 Additional requirements: As specified in individual specification sections.

1.9 MATERIALS AND FINISHES

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

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

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

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

1.10 MAINTENANCE MATERIALS

.1 On completion of project, submit to Architect two (2) copies of Operations Data and Maintenance Manual in English, made up as follows:

.1 Bind data in vinyl hard covered, 3 ring loose leaf binder for 215 x 280 mm size paper.

.2 Enclose title sheet, labeled "Operation Data and Maintenance Manual", project name, date and list of contents.

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

.2 Include following information, plus data specified.

.1 Maintenance instruction for finished surface and materials.

.2 Copy of hardware and paint schedules.

.3 Description, operation and maintenance instructions for equipment and systems, including complete list of equipment and parts list. Indicate nameplate information such as make, size, capacity, serial number.

.4 Names, addresses and phone numbers of sub-contractors and suppliers.

.5 Guarantees, Warranties and bonds showing:

.1 Name and address of project.

.2 Guarantee commencement date (date of Final Certificate of Completion).

.3 Duration of guarantee.

.4 Clear indication of what is being guaranteed and what remedial action will be taken under guarantee.

.5 Signature and seal of Contractor.

.6 Additional material used in project listed under various Sections showing name of manufacturer and source of supply.

.3 Neatly type lists and notes. Use clear drawings, diagrams or manufacturers' literature.

.4 Include one complete set of final shop drawings (bound separately) indicating corrections and changes made during fabrication and installation.

.5 Preliminary submission of <u>all</u> manuals is required for Certificate of Substantial Completion to be issued. Submission of final manuals to the Architect is a mandatory requirement of Total Performance of the Contract.

1.11 STORAGE, HANDLING AND PROTECTION

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

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

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

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

.5 Remove and replace damaged products at own expense and to satisfaction of Consultant.

1.12 GUARANTEES, WARRANTIES AND BONDS

.1 **Bonds:** Refer to Section 01102 'Stipulated Price Contract-PBE-1998', Section 011100 'Summary of Work' and to Section 002113 'Instructions to Bidders' for bonding requirements for this project, both at the time of tender submission and throughout the duration of the construction period.

.2 Refer to Section 'Stipulated Price Contract-PBE-1998 for Warranty requirements and conditions for the standard warranty which is required for the work of this contract.

.3 Refer to Section 011100 'Summary of Work', under 'Warranties' and also individual specifications sections for requirements of extended warranties required for particular sections or items of work.

.4 Extended warranties are required to be issued by manufacturers, fabricators, suppliers and/or installers, sometimes jointly, due to their unique position in the construction process and their ability to guarantee a particular section of work. Refer to individual requirements of extended warranties requested.

.5 Unless specifically noted otherwise, all extended warranties shall commence on the date of Substantial Performance of the Work as certified by the Consultant.

.6 Separate each warranty or bond with index tab sheets keyed to the List of Contents listing.

.7 List subcontractor, supplier, and manufacturer, with name, address, and telephone number of responsible principal. Use Guarantee/Warranty Form as provided in Section 017810 whenever standard preprinted trade or manufacturer's Guarantee/Warranty forms are not available. Provide written form for each warranty specified in each Section or if none, in Section 011100, article 1.24.

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

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

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

.11 Co-execute submittals when required.

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

Part 2 Products

2.1 NOT USED

.1 Not Used.

Part 3 Execution

3.1 NOT USED

.1 Not Used.

END OF SECTION

1. Notes

1. To be made out on the letterhead of Guarantor or Warrantor which usually is a Subcontractor.

2. This format is to be used only when standard preprinted trade or manufacturer's forms are not available. Preprinted forms are to include all elements of information shown on this sample or as a minimum.

3. Comply with Requirements for Guarantee/Warranty as specified in Section 017810, Closeout Submittals.

To: Peel District School Board
H.J.A.B. Education Centre
5650 Hurontario Street
Mississauga, ON L5R 1C6

Date: _____

SECTION _____

TITLE _____

GUARANTEE/WARRANTY TO:

OWNER The Peel District School Board

PROJECT Accessibility Renovation to Burnhampthorpe Public School

ARCHITECT Hossack Architecture

REFERENCE (to specifications or drawings)

TIME Period of Guarantee/Warranty:_____ years

GUARANTEE/ WARRANTY Starting Date: Substantial Performance as certified by Architect

Date: _____

(Description of Guarantee/Warranty)

_____

_____

_____

Upon written notification from the Owner or the Consultant that the above work is defective any repair or replacement work required shall be to the Consultant's satisfaction at no cost to the Owner.

This guarantee shall not apply to defects caused by the work of others, maltreatment of materials, negligence or Acts of God.

SUBCONTRACTOR

_____ _____
Signature Date

Authorized Signing Officer:

_____
(Name Printed)

_____
Title

Name of Firm: _____

Address: _____

Telephone Number _____

CONTRACTOR

_____ _____
Signature Date

Authorized Signing Officer:

_____ _____
(Name Printed)

_____
Title

Name of Firm: _____ CORPORATE SEAL

Address: _____

Telephone Number _____

END OF SECTION

Part 1 General

1.1 QUALITY ASSURANCE

.1 This Section includes parameters for the general design and performance for the work of Sections which comprise the building envelope including but not limited to, masonry cavity walls, metal cladding, soffits, windows, entrances and roofing.

.2 Performance of the building envelope shall be guaranteed by the Contractor.

1.2 DESIGN

.1 General: Design and engineer as required, fabricate, erect, and/or install building envelope in compliance with the Ontario Building Code, other regulations and requirements of authorities having jurisdiction.

.2 Take into account construction tolerance limitations, creepage, deflection and other movements of the structure.

.3 Accommodate, by means of expansion and contraction provisions, any movement in the building envelope assemblies themselves and between the assemblies and the building structure. Allow for expansion and contraction of components caused by ambient temperature range, surface temperature variation of components, wind, seismic forces, structural deflection and racking; without causing misalignment of joints, breakage of joints and air/vapour barriers, water and air penetration through the assembly, glass breakage, or other defects detrimental to appearance or performance.

.4 Method of attachment to the structure shall take into account site peculiarities so that site and air vibrations or normal temperature movements of the building do not loosen, weaken and/or fracture the connection between building envelope assembly components and the structure or between the components themselves.

.5 Reinforce building envelope assembly components, as required, so that the members can safely sustain design loads.

.6 Assemble and secure assemblies in manner which will keep stresses on sealants within the sealant manufacturer's recommended maximum performance levels.

.7 Rain Screen Principle: Except where detailed otherwise, construct building envelope assemblies based on the "Rain Screen" principle as advocated by the National Research Council of Canada. All voids between the assembly components as well as those between components and the structure shall have:

.1 Gaskets, baffles, overlaps, seals and compartmentalization as required providing a barrier "Rain Screen" to effectively prevent excessive rain water entry into any of the building envelope cavities but to allow pressure equalization of cavity air spaces.

.2 Air barriers and seals are required to prevent entry of interior building air into building envelope cavities, and exterior air into the building. Air barriers and seals shall be able to withstand wind design pressures.

.3 such provisions in the form of openings between cavities and the building exterior of sufficient cross sections to provide adequate pressure equalization. All openings shall be effectively baffled against direct rain water entry. Air spaces

shall be baffled and compartmentalized to prevent chimney effect within the air spaces vertically and horizontally.

.4 Thermal separators, isolators and seals placed to eliminate contact between interior humid air and a cold surface or structural component to prevent condensation and ice build-up on such surfaces during cold weather.

1.3 WATER, VAPOUR AND MOISTURE

.1 Comply with the design and performance requirements specified in the building code, and as specified herein, including the following principles:

.2 Drain to the exterior face of the assembly, any water entering at joints and any condensation occurring within the building envelope assembly.

.3 Design, fabricate and install the assembly to be watertight to the interior under the interior and exterior design conditions in combination with movements occurring due to loads imposed.

.4 At design conditions no water penetration to the building interior side of the assembly shall occur.

.5 The requirements for an air barrier and a vapour barrier are intended to be provided at the same plane in the building envelope design unless otherwise indicated or specified. In such cases, the Drawings and Specifications refer to "air/vapour barrier". The definition of the air/vapour barrier for the purpose of these Specifications is "a continuous membrane including joints of membrane between components and to adjacent construction which prevents or retards penetration of moisture laden air and the diffusion of water vapour through it".

.6 The maximum water vapour transmission of all components forming the vapour barrier shall be (1.72 ng/Pa x s x sq.m.) (0.3 Imperial Perms) unless specified otherwise.

.7 At design conditions no condensation shall occur on room side surfaces.

.8 Sound: Provide completed installations free from vibrations, wind whistles and noise due to thermal and structural movement and wind pressure.

.9 Seismic: Fabricate and erect cladding assemblies to prevent damage due to earthquake forces as required by The Ontario Building Code.

Part 2 Products

2.1 NOT USED

.1 Not Used.

Part 3 Execution

3.1 NOT USED

.1 Not Used.

END OF SECTION

PART 1 GENERAL

1.1 Related Sections

1. Section 01 11 00 - Summary of Work
2. Section 01 56 00 – Temporary Barriers and Enclosures
3. Section 01 73 03 – Execution Requirements (Cutting and Patching)
4. Section 04 21 13- Brick and Block Masonry
5. Section 01 33 00 - Submittal Procedures
6. Section 08 11 14- Metal Doors and Frames
7. Section 08 71 15 – Finish Hardware
8. Section 09 91 22- Painting
9. Section 09 21 16- Gypsum Board Assemblies
10. Section 09 51 13- Acoustic Panel Ceilings
11. Section 10 11 25- Manufactured Specialties
12. Mechanical and Electrical Sections

1.2 Scope

1. Scope includes but is not limited to:

   .1 Demolition or alteration of all structural, architectural, mechanical, electrical or site components, equipment, fitments and finishes as required to execute the work.

   .2 The removal, repair and reinstallation as required to make good of existing acoustic unit ceilings gypsum board bulkheads, hollow metal screens and partition walls where required to be removed for routing new services or revising demising walls.

   .3 Removal and reinstallation as indicated of any existing fixed in place millwork, chalkboards or tackboards or similar fitments or devices identified to remain and be reinstalled.

   .4 Grinding and patching of walls where chalkboards or fitments have been removed and surface adhesives or similar surface deficiencies remain.

   .5 Cutting and removal of slabs on grade to remove existing drains, oil interceptors, trenches and sub slab services contained within them, not previously removed by Abatement work..

   .6 Making good of all walls and floors remaining where sections of walls or floors have been removed and surfaces require repair.

   .7 Making good of all finishes to remain as result of selective demolition.

1.3 Existing Conditions

1. Take over structures to be demolished or altered based on their condition on date that tender is accepted, at time of examination prior to tendering.
2. Contractor may confirm the prior removal of all asbestos containing materials in documentation left on site following prior abatement work contract. Should areas of asbestos be found which are not documented as removed or included in the scope of this

work for removal, it shall be reported to the Consultant and Owner's representative for review and instructions for removal.

3. Prior to beginning alteration or demolition, confirm with Owner that no items to be salvaged or turned over to the owner remain in the work areas.

1.4 Protection

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

.2 Take precautions to support structures and, if safety of building being demolished or adjacent structures or services appears to be endangered, cease operations and notify Consultant.

.3 **Refer to Section 01 11 00 and Section 01 33 00 for requirements to provide Shoring Designs and Method Statements**.

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

Part 2 Products

NOT USED

Part 3 Execution

3.1 Work

.1 Dispose of demolished materials except where noted otherwise and in accordance with authorities having jurisdiction. Confirm in Divisions 15 and 16 for removal and re-use of mechanical and electrical materials and equipment.

.2 Refer to drawings for furniture, materials or equipment to be removed and turned over to the owner. Carefully remove such items and store in location designated by Owner.

3. For a scope of work refer to all Drawings and also coordinate items to be altered, re-built, cleaned or otherwise "made good" as a result of the cutting and patching scope of work described in Section 01 73 03 Execution Requirements or other Sections.

3.2 Preparation

.1 Disconnect electrical, telephone/PA and data service lines in work areas without disrupting main service to building and in accordance with regulations of authorities having jurisdiction. Post warning signs on electrical lines and equipment which must remain energized to serve other properties during period of demolition.

.2 Disconnect and cap designated mechanical services in accordance with requirements of local authority having jurisdiction.

.1 Natural gas supply lines, if applicable to be removed by gas company by qualified tradesman in accordance with gas company instructions.

.2 Remove, cap or dispose of other underground services as indicated in drawings.

.3 Do not disrupt active or energized utilities traversing premises designated to remain undisturbed.

.3 Floor scans to locate hidden or buried services in the work area have NOT previously been done. Prior to cutting, demolition or removal of any slabs on grade or areas where services may be concealed, engage a **private locate firm to provide magnetic and X-ray scans** of all areas involved. This is the responsibility of the General Contract and costs for such scans are to be included in the base contract price.

3.3 Disconnection and Removal of Materials and Equipment

.1 Contractor shall cooperate with the Owner to determine which materials are to be removed and retained by Owner. The Owner will decide which items or equipment they wish to retain as their property and all other materials shall be removed from the premises by this Contractor. The equipment which is to be retained by the Owner shall be stored on site where directed by the Owner.

.2 Refer to mechanical and electrical drawings and for disconnection and removal and/or relocated existing electrical, ductwork, piping and/or equipment.

3.4 Temporary Removals and Replacement

.1 All items to be removed and installed shall be completed so that replaced materials are left in a clean undamaged state. If required to be replaced due to damage, the contractor shall include in his price for the component to be replaced and installed at no additional cost to the Contract.

3.5 Selective Demolition

.1 Follow best trade practices for all demolition and alteration work. This includes but is not limited to the following items.

.1 The school will be vacant for the specified construction period until September 1, 2010. Despite this, ensure demolition work does not disrupt any ongoing aspect of the operation of the school.

.2 Confirm all demolition work (including potential noise, vibration, tools or equipment noise, etc.) in advance with the principal of the school on a daily basis. Similarly, notify all building occupants in advance at each possible interruption in services or utilities.

.3 Protect all areas from damage and intrusion by means of locking rooms under construction when not in use, use of dust tight screens and temporary partitions and hoarding. Demolish to minimize dusting. Refer to drawings for locations and other Specification Sections for requirements.

.4 Signage to be posted at all times. Take precautions to demolish only areas as necessary to complete the work, and avoid damage to adjacent areas. Make good all areas affected by demolition or renovation activities, whether specifically included in the contract documents or not.

.5 The Contractor shall be responsible for damage to all areas affected by renovation or alteration activities.

.6 Prior to demolition, the Contractor shall carefully examine the drawings in relation to the site conditions, to ensure that all intended work can be carried out without ambiguity. Incorrect demolition of any work by the Contractor, will be back-charged to him. Any discrepancies between the drawings and the site conditions, must be

reported to the Consultants immediately.

.7 Demolish or remove interior and exterior elements as indicated.

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

.9 At end of each day's work, leave work in safe condition so that no part is in danger of toppling or falling. Protect interiors of parts not to be demolished from exterior elements at all times.

.10 Demolish masonry and concrete walls in small sections. Salvage existing imperial block units in coordination with Section 04 21 13 to re-use as patching in existing imperial unit masonry. Also coordinate with Section 04 21 13 for detail of edge condition required to match new Metric Units to existing Imperial block units.

.11 Carefully remove and lower structural framing and other heavy or large objects as required. Where partial walls of exposed concrete block masonry is to remain, grind all exposed edges to a bullnose and patch as required suitable for final painting.

.12 Do not sell or burn materials on site.

.13 Remove contaminated or dangerous materials from site and dispose of in safe manner to minimize danger at site or during disposal, in accordance with all governing legislation.

.14 Saw cut and existing terrazzo floor and base as required and remove to nearest metal ‘panel’ joint to enable replacement at a full panel.

.15 Following demolition and removals of floor trenches, walls and fitments, coordinate with Section 01 73 03. As part of the work of this section, scarify or otherwise grind existing or new slabs in preparation for slab in-fills and a self leveler skim slab by Section 01 73 03. That Section is responsible for the provision of a backfill, slab on grade patching and self leveling skim coat where required in advance of new VCT finishes by Section 09 65 19.

.16 Patch and make good existing wall, ceiling and floor finish with identical original materials if affected by temporary protection or by previous Abatement contract.

3.6 Repair to all Finishes and Colours

.1 Repaint all walls in rooms or areas modified as indicated in the Finish Schedule, or as directed by the Consultant.

.2 Repair and make good all fixtures, finishes, trims and surfaces to all floor, wall and ceiling areas in rooms or areas whether or not they have been modified or affected by the work or by previous Abatement Contract.

.3 Existing paint colours are to be matched exactly using computer colour matching.

END OF SECTION

Part 1 General

1.1 ASBESTOS ABATEMENT – FOR INFORMATION ONLY

.1 Asbestos Abatement has been completed under a separate contract in advance of this contract.

Therefore, the Pre-Renovation Hazardous Building Materials Survey as prepared by OHE Consultants is enclosed in Binder C.

.2 The specification sections entitled "Asbestos Abatement…" contains information that is not prepared by the Architect or his sub consultants. While every effort has been made to attempt to provide comprehensive abatement testing information for the purposes of design and tendering, the Architect claims no responsibility for the accuracy of the information contained in the report.

.3 Refer also to Section 01 35 30, item 1.6 'Hazardous Materials' and item 1.23 'Asbestos' and coordinate with this section.

Part 2 Products

2.1 Not applicable

Part 3 Execution

3.1 Not Applicable

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

.1 Section 02 20 00 – Earthwork

.2 Section 03 20 00 - Concrete Reinforcement

.3 Section 03 30 20 - Cast-in-Place Concrete

.4 Section 07 92 10 - Joint Sealing

1.2 MEASUREMENT PROCEDURES

.1 No measurement will be made under this Section. Include costs in items of work for which concrete formwork and falsework is required.

1.3 REFERENCES

.1 Canadian Standards Association (CSA)

.1 CAN/CSA-A23.1-04, Concrete Materials and Methods of Concrete Construction.
.2 CAN/CSA-O86-01-94(R2006), Engineering Design in Wood (Limit States Design).
.3 CSA O121-M1978(R2003), Douglas Fir Plywood.
.4 CAN3-O188.0-M78, Standard Test Methods for Mat-Formed Wood Particleboards and Waferboard.
.5 CSA S269.1-1975, Falsework for Construction Purposes.
.6 CAN/CSA-S269.3-M92(R2003), Concrete Formwork.

.2 Council of Forest Industries of British Columbia (COFI)

.1 COFI Exterior Plywood for Concrete Formwork.

1.4 SHOP DRAWINGS

.1 Submit shop drawings for formwork and falsework in accordance with Section 01 33 00 - Submittal Procedures.

.2 Indicate method and schedule of construction, shoring, stripping and re-shoring procedures, materials, arrangement of joints, special architectural exposed finishes, ties, liners, and locations of temporary embedded parts. Comply with CSA S269.1, for falsework drawings. Comply with CAN/CSA-S269.3 for formwork drawings.

.3 Indicate sequence of erection and removal of formwork/falsework.

.4 Each shop drawing submission shall bear stamp and signature of qualified professional engineer registered or licensed in Province of Ontario, Canada.

1.5 WASTE MANAGEMENT AND DISPOSAL

.1 Place materials defined as hazardous or toxic waste in designated containers.

.2 Ensure emptied containers are sealed and stored safely for disposal away from children.

.3 Use sealers, form release and stripping agents that are non-toxic, biodegradable and have zero or low VOC's.

Part 2 Products

2.1 MATERIALS

.1 Formwork materials:

.1 For concrete without special architectural features, use wood and wood product formwork materials to CAN/CSA-O86-01.

.2 For concrete with special architectural features, use formwork materials to CAN/CSA-A23.1.

.2 Pan forms: permanent steel as indicated.

.3 Tubular column forms: round, smooth steel forms in two half sections, internally treated with release material.

.4 Form ties:

.1 For concrete not designated 'Architectural', use removable or snap-off metal ties, fixed or adjustable length, free of devices leaving holes larger than 25 mm dia. in concrete surface.

.2 For Architectural concrete, use snap ties complete with plastic cones and light grey concrete plugs.

.5 Form liner:

.1 Plywood: high density overlay, Douglas Fir to CSA O121, T and G edge, 12 mm thick.

.2 Plastic laminate, vinyl, polyethylene, neoprene or approved products new and acceptable to the Consultant to provide the surface texture and forms required for the design as shown.

.6 Form release agent: chemically active release agents containing compounds that react with free lime in concrete resulting in water insoluble soaps.

.7 Form coating: Formaseal as manufactured by Master Builders for wood forms and as recommended by manufacturer for form liner.

.8 Joint tape: non-staining, water-impermeable, self-releasing, where required.

.9 Tie hole plugs: 25mm dia. tapered PVC hole plugs to be provided on all exposed walls.

.10 Falsework materials: to CSA-S269.1.

.11 Sealant: to Section 07 92 10 - Joint Sealing.

Part 3 Execution

3.1 FABRICATION AND ERECTION

.1 Verify lines, levels and centres before proceeding with formwork/falsework and ensure dimensions agree with drawings.

.2 Obtain Consultant's approval for use of earth forms framing openings not indicated on drawings.

.3 Hand trim sides and bottoms and remove loose earth from earth forms before placing concrete.

.4 Fabricate and erect falsework in accordance with CSA S269.1 and COFI Exterior Plywood for Concrete Formwork.

.5 Do not place shores and mud sills on frozen ground.

.6 Provide site drainage to prevent washout of soil supporting mud sills and shores.

.7 Fabricate and erect formwork in accordance with CAN/CSA-S269.3 to produce finished concrete conforming to shape, dimensions, locations and levels indicated within tolerances required by CAN/CSA-A23.1.

.8 Obtain Consultant's permission before framing openings not indicated.

.9 Align form joints and make watertight. Keep form joints to minimum.

.10 Locate horizontal form joints for exposed columns 2700 mm above finished floor elevation.

.11 Use 25 mm chamfer strips on external corners and/or 25 mm fillets at interior corners , joints, unless specified otherwise.

.12 Form chases, slots, openings, drips, recesses, expansion and control joints as indicated.

.13 Line forms for following surfaces:

- .1 Outer face of beams and joists.
- .2 Soffit of girders, beams and slabs that are specified to be exposed.

.14 Clean formwork in accordance with CAN/CSA-A23.1, before placing concrete.

.15 Obtain approval from soils testing engineer for bearing surfaces prior to erection of forms.

3.2 REMOVAL AND RESHORING

.1 Leave formwork in place for following minimum periods of time after placing concrete.

- .1 3 days for walls and sides of beams.
- .2 3 days for columns.
- .3 7 days for beam soffits, slabs, decks and other structural members, or 3 days when replaced immediately with adequate shoring to standard specified for falsework.

.4 2 days for footings and abutments.

.2 Provide all necessary reshoring of members where early removal of forms may be required or where members may be subjected to additional loads during construction as required.

.3 Re-use formwork and falsework subject to requirements of CAN/CSA-A23.1.

.4 Be responsible for the safety of the structure, both before and after the removal of forms, until the concrete has reached its specified 28 day strength.

.5 When forms are stripped during the curing period, cure and protect the exposed concrete in accordance with Section 03300.

.6 Movement and displacement of formwork during construction, variations in excess of specified tolerances and marked and disfigured surfaces that cannot be repaired by specified methods will be considered defective work performed by this Section.

.7 Reconstruct defective formwork and replace concrete and reinforcement placed in defective formwork at no additional cost to the Owner.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

.1 Section 03 10 00 – Concrete Formwork & Accessories

.2 Section 03 30 20 - Cast-in-Place Concrete

.3 Section 04 21 13 - Masonry.

1.2 MEASUREMENT PROCEDURES

.1 Reinforcing steel will be measured in tonnes of steel incorporated into work, computed from theoretical unit mass specified in CAN/CSA-G30.18 for lengths and sizes of bars as indicated or authorized in writing by Consultant.

1.3 REFERENCES

.1 American Concrete Institute (ACI)

.1 ACI 315R-04, Manual of Engineering and Placing Drawings for Reinforced Concrete Structures.

.2 American National Standards Institute/American Concrete Institute (ANSI/ACI)

.1 ANSI/ACI 315-99, Details and Detailing of Concrete Reinforcement.

.3 American Society for Testing and Materials (ASTM)

.1 ASTM A 775/A 775M-91c, Specification for Epoxy-Coated Reinforcing Steel Bars.

.4 Canadian Standards Association (CSA)

.1 CAN/CSA-A23.1-04, Concrete Materials and Methods of Concrete Construction.

.2 CSA-A23.2-14, Test Methods and Standard Practices for Concrete

.3 CAN3-A23.3-04, Design of Concrete Structures for Buildings.

.4 CSA G30.3-M1983(R1991), Cold Drawn Steel Wire for Concrete Reinforcement.

.5 CSA G30.5-M1983(R1991), Welded Steel Wire Fabric for Concrete Reinforcement.

.6 CSA G30.14-M1983(R1991), Deformed Steel Wire for Concrete Reinforcement.

.7 CSA G30.15-M1983(R1991), Welded Deformed Steel Wire Fabric for Concrete Reinforcement.

.8 CAN/CSA-G30.18-M92(R2002), Billet-Steel Bars for Concrete Reinforcement.

.9 CAN/CSA-G40.21-04, Structural Quality Steels.

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

.11 CSA W186-M1990, Welding of Reinforcing Bars in Reinforced Concrete Construction.

1.4 SHOP DRAWINGS

.1 Submit shop drawings including placing of reinforcement in accordance with Section 01 33 00 - Submittal Procedures.

.2 Indicate bar bending details, lists and quantities of reinforcement on shop drawings.

.3 On placing drawings, indicate sizes, spacings, locations and quantities of reinforcement, mesh, chairs, spacers, hangers, and mechanical splices, with identifying code marks to permit correct placement without reference to structural drawings. Prepare reinforcement drawings in accordance with ANSI/ACI 315 and ACI 315R, Manual of Engineering and Placing Drawings for Reinforced Concrete Structure and Reinforcing Steel Manual of Standard Practice - Metric Supplement 2004 by Reinforcing Steel Institute of Ontario.

.4 Design and detail lap lengths and bar development lengths to CAN3-A23.3, unless otherwise indicated. Provide Class B tension lap splices unless otherwise indicated.

1.5 SUBSTITUTES

.1 Substitution of different size bars permitted only upon written approval of the Consultant

Part 2 Products

2.1 MATERIALS

.1 Reinforcing steel: billet steel, grade 400, deformed bars to CAN/CSA-G30.18, unless indicated otherwise. Use Grade 400R bars for all reinforcing unless noted otherwise, to sizes as shown on the drawings.

.2 Cold-drawn annealed steel wire ties: to CSA G30.3.

.3 Deformed steel wire for concrete reinforcement: to CSA G30.14.

.4 Welded wire fabrics: Where no reinforcement is shown, provide 152 x 152 MW 18.7 x MW 18.7 (6" x 6" x 6/6) welded wire fabric at 37mm (1½ ") below the finished surface of slabs on grade or walks, or toppings 62mm (2½") in thickness or greater. Lap ends and sides of fabric in accordance with requirements of CSA Standard CAN/CSA-A23.1, but in any event, not less than 300mm (12").

.5 Chairs, bolsters, bar supports, spacers: to CAN/CSA-A23.1.

.6 Mechanical splices: subject to approval of Consultant.

2.2 FABRICATION

.1 Fabricate reinforcing steel in accordance with CAN/CSA-A23.1, ANSI/ACI 315, and ACI 315R, Manual of Engineering and Placing Drawings for Reinforced Concrete Structures unless indicated otherwise.

.2 Obtain Consultant's approval for locations of reinforcement splices other than those shown on placing drawings.

.3 Upon approval of Consultant, weld reinforcement in accordance with CSA W186.

.4 Ship bundles of bar reinforcement, clearly identified in accordance with bar bending details and lists.

2.3 SOURCE QUALITY CONTROL

.1 Upon request, provide Consultant with certified copy of mill test report of reinforcing steel, showing physical and chemical analysis, minimum 2 weeks prior to commencing reinforcing work.

.2 Upon request inform Consultant of proposed source of material to be supplied.

Part 3 Execution

3.1 STORAGE OF REINFORCING

.1 Reinforcing shall be stored off the ground to keep it free from dirt and to maintain its fabricated form.

3.2 FIELD BENDING

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

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

.3 Replace bars which develop cracks or splits.

3.3 PLACING REINFORCEMENT

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

.2 Prior to placing concrete, obtain Inspector's approval of reinforcing material and placement. Provide minimum 48 hours notice to both Inspector and Consultant, prior to placing concrete.

.3 Locate reinforcing bars to provide proper concrete cover. Reinforcing cover will be carefully inspected by the Consultant, and reinforcing with inadequate cover will not be acceptable.

.4 Fold all the wired behind bars, away from form faces.

.5 Modify bars on site to accommodate box-outs, inserts, etc., as directed by the Consultant.

3.4 FIELD CUTTING OF REINFORCING

.1 Field cut reinforcing bars only where permitted by the Consultant.

END OF SECTION

Part 1 General

1.1 GENERAL REQUIREMENTS

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

1.2 WORK IN OTHER SECTIONS

.1 Related Work Specified in Other Sections

Section 02 20 00 – Earthwork
Section 02 55 00 – Site Services
Section 03 10 00 – Concrete Formwork & Accessories
Section 03 20 00 – Concrete Reinforcing
Section 04 20 00 – Unit Masonry
Section 05 10 00 – Structural Metal Framing
Section 05 50 00 – Miscellaneous Metal
Section 07 46 10 – Cementitious Surfacing System
Division 15 – Mechanical
Division 16 – Electrical

1.3 REFERENCE STANDARDS

CSA-A23.1-14 – Concrete Materials and Methods of Concrete Construction
CSA A23.2-14 – Test Methods and Standard Practices for Concrete
CAN/CSA-A3001: Portland Cement
CAN/CSA-A23.5-M86: Supplementary Cementing Materials
CAN/CSA-A362-93: Blended Hydraulic Cement
CSA G30.18-09 (R2014): Carbon steel bars for concrete reinforcement
CSA G30.3-M1983 (R1998): Cold-Drawn Steel Wire for Concrete Reinforcement
ASTM A820/A820M-16, Standard Specification for Steel Fibres for Fibre Reinforced Concrete.

1.4 SAMPLES

.1 At least (3) weeks prior to commencing work, inform the Consultant of the proposed mix design and proposed source of ready mixed concrete.

.2 A sample of the finishes shall be prepared and remain as the minimum acceptable standard for the project.

1.5 CERTIFICATES

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

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

1.6 QUALITY ASSURANCE

.1 The Contractor shall employ an independent inspection and testing company to carry out all testing and inspection as required. The Consultant will appoint the inspection and testing company. The cost of inspection and testing shall be paid by the Contractor, out of the Cash Allowance carried for this testing under Division 1.

.2 Samples and methods of moulding shall conform to the requirements of CSA-A23.2.

.3 Additional testing shall be made if there is a distinct change in job conditions or if required by the Consultant or the authority having jurisdiction.

.4 Compression tests shall be performed in accordance with CSA-A23.2 and good practice.

.5 Failure to meet strength requirements will result in rejection of materials, strengthening or replacement of those portions that failed to develop the specified strength.

.6 Concrete slump shall be tested at time that cylinders are cast and at such other times deemed necessary.

.7 The addition of water and admixtures on the site is hereby prohibited and unacceptable for the project.

1.7 SUBMITTALS

.1 Submit shop drawings in accordance with Section 01300 Submittals.

1.8 WASTE MANAGEMENT AND DISPOSAL

.1 Designate a cleaning area for tools to limit water use and runoff.

.2 Carefully coordinate the specified concrete work with weather conditions.

.3 Ensure emptied containers are sealed and stored safely for disposal away from children.

.4 Prevent plasticizers, water-reducing agents and air-entraining agents from entering drinking water supplies or streams. Using appropriate safety precautions, collect liquid or solidify liquid with an inert, non-combustible material and remove for disposal. Dispose of all waste in accordance with applicable local, provincial and national regulations.

.5 Choose least harmful, appropriate cleaning method which will perform adequately.

Part 2 Products

2.1 MATERIALS

.1 Formwork: As specified in Section 03100.

.2 Formwork Lumber:

.1 Plywood and wood formwork materials to CSA-A23.1. Formwork materials brought on site shall be new.

.2 Panels shall be fabricated for use as form panels, finished one side with form coating, with sealed edges and a minimum thickness of 17mm.

.3 Panels shall be smooth and free from defects which would show up on concrete surfaces exposed to view.

.4 Form Coating: Formaseal, as manufactured by Sternson Construction Products.

.5 Joint Tape: Non-staining, water impermeable, self-releasing.

.6 Form Ties: Removable or snap-off metal ties, fixed or adjustable length, free of devices leaving holes larger than 25mm diameter in concrete surface, and not leaving metal closer than 25mm to the surface of the concrete.

.7 Tie Hole Plugs: 25mm dia. tapered P.V.C. hole plugs.

.8 Reinforcing Steel: As specified in Section 03200.

.9 Reinforcing Steel: Billet steel, grade 400R, deformed bars to CAN/CSA-G30.18 to sizes shown on structural drawings. Where none is shown, provide 15M bars at 300mm centres as minimum steel.

.10 Wire Mesh: Welded Wire Fabric to sizes and locations shown on drawings. Where none is shown, provide 152x152xMW18.7xMW18.7 W.W.F. one layer as minimum.

.11 Portland Cement: to CAN/CSA-A3001, Type GU.

.12 Water: to CSA-A23.1.

.13 Aggregates: To CSA-A23.1. Coarse aggregates to be normal density. Use blend of 10mm and 20mm for coloured patterned concrete slabs.

.14 Air Entraining Admixture: To CAN/CSA3-A23.5.

.15 Chemical Admixtures: To CAN/CSA3-A23.5 water reducing type WN. Consultant to approve accelerating or set retarding admixtures during cold and hot weather placing.

.16 Colour Admixtures: Integral coloured pigments to C-979-86. Two (2) colours to be selected by Consultants from manufacturer's standard range.

.17 Non-Shrink Grout: Sternson M-Bed Superflow or approved equal.

.18 Floor Hardener: Surflex TR trap rock hardener, shake on, by Euclid Chemical Company. Application rate of 5kg/m^2 (1.0 lb/ft^2).

.19 Interior Cure and Seal Compound: Interior slabs shall be W. R. Meadows "Intex". No resin-based compounds will be accepted.

.20 Exterior Cure and Seal Compound: Exterior concrete slabs and gutters shall be W. R. Meadows "Sealtight CS-309".

.21 Expansion Joint Filler: Shall be Sealtight asphalt expansion joint filler, W. R. Meadows.

.22 Joint and Sawcut Filler: Shall be Loadflex by Sternson or Jointflex by CPD.

.23 Joint Tape: Shall be Sealtight Gusset Tape by W. R. Meadows.

.24 Premoulded Membrane: Shall be Sealtight 7100-312 (PMPC), W. R. Meadows.

2.2 CONCRETE MIXES

.1 Proportion normal density concrete in accordance with CSA A23.1, to give following properties for concrete in foundation walls, footings, composite deck toppings and any other unspecified concrete:
- .1 Cement: Type GU Portland cement, minimum 325 kg/m^3
- .2 Maximum 25% slag cement content
- .3 Minimum compressive strength at 28 days: 25 MPa.
- .4 Nominal size of coarse aggregate: 20 mm.
- .5 Slump at time and point of discharge: 50 to 100 mm.
- .6 Air content: 0 to 3%.

.2 Proportion normal density concrete in accordance with CSA-A23.1, Alternative 1 to give following properties: for concrete in slabs-on-grade, structural slabs and columns:
- .1 Cement: Type GU Portland cement, minimum 325 kg/m^3
- .2 Maximum 25% slag cement content
- .3 Minimum compressive strength at 28 days: 32 MPa.
- .4 Nominal size of coarse aggregate: 20 mm.
- .5 Slump at time and point of discharge: 60 to 100 mm.
- .6 Air content: 0 - 3% maximum.

.3 Proportion normal density concrete in accordance with CSA-A23.1, to give following properties: for concrete in exterior structural slabs and sidewalks/curbs:
- .1 Cement: Type GU Portland cement, minimum 275 kg/m^3
- .2 Maximum 25% slag cement content
- .3 Minimum compressive strength at 28 days: 32 MPa.
- .4 Class of exposure: C-2.
- .5 Nominal size of coarse aggregate: 20 mm.
- .6 Slump at time and point of discharge: 60 to 100 mm.
- .7 Air content: 5 to 8%.

.4 Proportion normal density concrete in accordance with CSA-A23.1, to give following properties: for concrete in grouted masonry blocks and concrete in metal pans.
- .1 Cement: Type GU Portland cement, minimum 275 kg/m^3
- .2 Maximum 25% slag cement content
- .3 Minimum compressive strength at 28 days: 20 MPa.
- .4 Nominal size of coarse aggregate: 10 mm.
- .5 Slump at time and point of discharge: 50 to 100 mm.
- .6 Air content: 0 - 3% maximum.

.5 Proportion normal density concrete in accordance with CSA-A23.1, Alternative 1 to give

following properties: for concrete fill.

.1 Cement: Type GU Portland cement, minimum 250 kg/m^3
.2 Maximum 25% slag cement content
.3 Minimum compressive strength at 28 days: 10 MPa.
.4 Nominal size of coarse aggregate: 10 mm/20 mm.
.5 Slump at time and point of discharge: 100 mm.
.6 Air content: 0 - 4% maximum.

.6 Do not change job mix formula without prior approval of the Consultant.

.7 In addition to 28 day strength tests, 7 days test may be carried out. If average strength at 7 days is less then 70% of specified 28 day strength, check mix at once and adjust to ensure required strength is obtained.

Part 3 Execution

3.1 WORKMANSHIP

.1 All concrete shall be as set forth in CSA-A23.1 and shall be composed of cement, fine and coarse aggregates and water.

.2 Concrete shall be delivered and discharged within 1½ hours after the introduction of the mixing water at the batch plant.

.3 Mixing, placing, compaction, curing, hot and cold weather protection shall conform to CSA-A23.1. Use power vibrators in sufficient number and in location and duration to the Consultant's complete satisfaction as required.

.4 Obtain the Consultant's approval before placing concrete. Provide 24 hour notice prior to placing of concrete.

.5 Pumping of concrete is permitted only after approval of equipment and mix.

.6 Ensure reinforcement and inserts are not disturbed during concrete placement in order to maintain proper coverage.

.7 Prior to placing of concrete obtain the Consultant's approval of proposed method for protection of concrete during placing and curing in adverse weather.

.8 Maintain accurate records of poured concrete items to indicate date, location of pour, quality, air temperature and test samples taken.

.9 Do not place load upon new concrete until authorized by the Consultant.

3.2 FORMWORK

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

.2 Construct forms to produce finished concrete conforming to shape, dimensions, locations and

levels indicated within tolerances required by CSA-A23.1.

.3 Align form joints and make watertight. Keep form joints to minimum.

.4 Use 25mm chamfer strips on all vertical and horizontal corners of exterior retaining walls as indicated on drawings.

.5 All surfaces of formwork which face concrete, which will be exposed to view are to be coated with protective form coating to minimize transfer of wood grain to finished concrete.

.6 Clean formwork in accordance with CSA-A23.1 before placing concrete.

.7 Re-use of formwork is subject to requirements of CSA-A23.1.

.8 When forms are stripped during the curing period, cure and protect the exposed concrete.

.9 Movement and displacement of formwork during construction, variations in excess of specified tolerances and marked and disfigured surfaces that cannot be repaired by specified methods will be considered defective work performed by this Section.

.10 Reconstruct defective formwork and replace concrete and reinforcement placed in defective formwork at no additional cost to the Owner.

3.3 INSERTS

.1 Co-ordinate and verify that the Electrical Contractor has set all ducts, boxes and other inserts and openings as indicated or specified elsewhere. Sleeves and openings greater than 100 x 100 mm not indicated on structural or civil drawings must be approved by the Consultant.

.2 Co-ordinate and verify that the Mechanical Contractor has set all floor drains, cleanouts, trench drains to provide a smooth, flush appearance with the **'FINISHED FLOOR SURFACE'** and to ensure a positive and uniform slope towards the drains.

.3 Do not eliminate or displace reinforcement to accommodate inserts or hardware. If inserts cannot be located as specified, obtain approval of all modifications from the Consultant before placing of concrete.

.4 Set anchor bolts to templates under supervision of appropriate trade prior to placing concrete. With the Consultant's approval, grout anchor bolts in preformed holes or holes drilled after concrete has set. Formed holes to be at least 100 mm in diameter. Drilled holes to be minimum 25 mm larger in diameter than bolts used. Protect anchor bolt holes from water accumulations. Set bolts and fill holes with non-shrink grout or epoxy (as noted on drawings).

.5 Set hollow metal frames, plumbed, squared and braced with blocking in locations shown on drawings.

3.4 GROUTING

.1 Grout underside of steel column bearing plates with non-shrinking grout to manufacturer's instructions. Place grout to cover steel shims left in place.

3.5 FINISHING

.1 Finish all concrete surfaces in accordance with Section 03350.

3.6 EXPANSION CONTROL

.1 Expansion Joints: Install expansion joint material between slabs on grade and masonry walls, for interior slabs and at max. 6000mm spacing for exterior slabs and curbs, and between slabs on grade and concrete curbs.

.2 Control Joints: Sawcut control joints at a maximum spacing of 3000mm in each direction and where noted on drawings. Cut joints within 24 hours of placing and to a depth as detailed on drawings.

3.7 WATER/VAPOUR CONTROL

.1 Butt joints tight together and tight to foundation wall. Seal all joints with gusset tape including foundation wall junctions.

.2 Protect during placing of concrete to ensure the integrity of the barrier is maintained. Repair immediately any penetrations or areas damaged in accordance with the manufacturer's recommendations.

3.8 CURING AND PROTECTION

.1 Cure and protect newly finished slabs and steps in accordance with CSA A23.1.

.2 Coat exterior slabs, curbs with curing compound and leave for 30 days. Apply sealer after curing period has expired.

.3 Cure finished concrete surfaces in a manner which will leave the surface with a uniform appearance and with a minimum of discolouration after drying. Ensure that curing compounds are compatible with adhesives for finishes to be applied later.

.4 For all concrete slabs that are to remain exposed, curing compound is to be applied at a rate required for use as a sealer/hardener, in accordance with the manufacturer's instructions.

3.9 FIELD QUALITY CONTROL

.1 Inspection and testing of concrete and concrete materials will be carried out by a Testing Laboratory designated by the Consultant in accordance with CSA-A23.1.

.2 The Consultant will take additional test cylinders during cold weather concreting. Cure cylinders on job site under same conditions as concrete which they represent.

.3 Inspection or testing by Consultant will not augment or replace contractor quality control nor relieve him of his contractual responsibility.

3.10 TOLERANCES

.1 Cast-in-Place concrete shall be constructed within the dimensional tolerances specified in CSA-A23.1, as specified elsewhere in this section. Concrete floor slabs shall be constructed as moderately flat slabs and within the tolerances listed below.

.2 Conform in line, level and plumbness to the following tolerances. These are maximum values.

.3 Variation from vertical, in lines and surfaces of walls piers:

:	In height of 3m (10')	-	6mm (1/4")

.4 Variation from level or from grades shown in floors grade:

:	In any 3m (10')	-	3mm (1/8")
:	In any bay up to 6m (20')	-	6mm (1/4")
:	In any 12m (40')	-	12mm (1/2")

.5 Variation from straight or from correct position in walls:

:	In length up to 6m (20')	-	12mm (1/2")
:	In any 12m (40')	-	12mm (1/2")

.6 Variation in size and location of sleeves, floor open and the like and in location of bolts, inserts and fastenings:

:		-	6mm (1/4")

.7 Variation in location of bolts, inserts, sleeves and fastenings when in group:

:		-	3mm (1/8")

.8 Variation in cross-section of slabs, walls and piers:

:	Maximum oversize	-	12mm (1/2")
:	Maximum undersize	-	6mm (1/4")

.9 There shall be no variations from required level at junction of walls and floors.

.10 Where drains occur, floors shall be properly and uniformly sloped to allow complete drainage of the area.

3.11 DEFECTIVE CONCRETE

.1 Concrete is defective when:
- .1 Containing visible honeycombing or embedded debris.
- .2 Concrete damaged by freezing or which is unsatisfactory due to placement at too high a temperature.
- .3 Average 28 day strength of any three consecutive strength tests is less than specified minimum 28 day strength.
- .4 Any 28 day strength test result in less than 88% of specified minimum 28 day strength.
- .5 Cracking occurs in locations other than at control and construction joints.
- .6 Curing is not carried out strictly according to the specifications.

.2 Remove and reconstruct in entirety any defective concrete footing, slabs, walls as directed by the Consultant.

3.12 COLD WEATHER PROTECTION

.1 Refer to CSA Standards CSA-A23.1 and CSA-A23.2 Provisions and Publications. Include for tarped heated enclosures - no non-freeze additives such as calcium will be tolerated on this project.

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

.1 Materials and installation for concrete floor hardeners, slip resistant coatings, and sheet curing materials.

1.2 RELATED SECTIONS

.1 Section 01 33 00 – Submittal Procedures

.2 Section 01 51 00 – Temporary Utilities

.3 Section 03 33 00 – Cast-in-Place Concrete

1.3 REFERENCES

.1 Health Canada - Workplace Hazardous Materials Information System (WHMIS)

.1 Material Safety Data Sheets (MSDS).

.2 CSA-A23.1-09: Concrete Materials and Methods of Concrete Construction

1.4 SUBMITTALS

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

.2 Submit WHMIS MSDS - Material Safety Data Sheets.

.1 WHMIS MSDS acceptable to Human Resources Development Canada-Labour and Health Canada for concrete floor hardeners.

.2 Indicate VOC content.

1.5 WASTE MANAGEMENT AND DISPOSAL

.1 Remove from site and dispose of packaging materials at appropriate recycling facilities.

.2 Collect and separate for disposal paper, plastic, polystyrene, and corrugated cardboard, packaging material in appropriate on-site bins for recycling.

.3 Dispose of unused chemical additive materials at an official hazardous materials collections site approved by Consultant.

.4 Unused chemical additive materials must not be disposed of into sewer system, into streams, lakes, onto ground or in other location where it will pose health or environmental hazard.

.5 Fold up metal banding, flatten and place in designated area for recycling.

.6 Dispose of unused chemical additive materials at an official hazardous materials collections site approved by Consultant.

1.6 ENVIRONMENTAL REQUIREMENTS

.1 Temporary lighting:

.1 Minimum 1200 W light source, placed 2.5 m above floor surface, for each 40 m^2 of floor being finished.

.2 Electrical power:

.1 Sufficient electrical power to operate equipment normally used during construction.

.3 Work area:

.1 Water tight protection against rain and detrimental weather conditions.

.4 Temperature:

.1 Maintain ambient temperature of not less than 10 degrees Celsius or C° from 7 days before installation to at least 48 hours after completion of Work and maintain relative humidity not higher than 40% during same period.

.2 Maintain substrate temperature at 10 C° minimum.

.5 Moisture:

.1 Ensure concrete substrate is within moisture limits prescribed by flooring manufacturer.

.6 Safety:

.1 Comply with requirements of Workplace Hazardous Materials Information System (WHMIS) regarding use, handling, storage, and disposal of hazardous materials.

.7 Ventilation:

.1 Ventilate area of work as directed by Consultant by use of approved portable supply and exhaust fans.

.2 Ventilate enclosed spaces in accordance with Section 01 51 00 - Temporary Utilities.

.3 Provide continuous ventilation during and after coating application.

.4 Sufficient to prevent carbon monoxide or high levels of carbon dioxide and other injurious gases from affecting concrete.

1.7 SCOPE OF WORK

.1 Provide liquid hardener at all exposed concrete slab-on-grade areas, and where exposed concrete is indicated on architectural drawings or in room finish schedule.

Part 2 Products

2.1 FLOOR HARDENER

.1 Concrete floor sealer (SCONC): where concrete curing agent/sealer/hardener is required, provide Shur-Seal as manufactured by Paul M. Wolff Co. Inc. (714) 974-0630 or Sure Hard manufactured by Dayton Superior's Canada Limited.

Part 3 Execution

3.1 EXAMINATION

.1 Examine area and conditions under which the work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the work and which do not

conform to manufacturer's recommendations. Do not proceed until unsatisfactory conditions have been corrected.

3.2 INSTALLATION

.1 On freshly poured concrete surfaces, no additional surface preparation will be required. All surfaces must be clean, sound and absorptive. Remove any concrete laitance and patch, fix all cracks and damaged areas. New concrete should be properly cured a minimum of seven (7) days, prior to placing the concrete floor hardener, in accordance with CSA A23.1 by one of the following methods: water, plastic sheeting or burlap.

.2 On areas where forms are recently removed, remove all form oil and breaking compound residue to assure penetration of the product into the surface.

.3 When applying near windows, mask the glass.

.4 Avoid contact with plant life, glass, aluminum, and other finished surfaces. Where contact occurs, immediately wipe with a damp cloth or flush with water.

.5 Avoid contact with asphaltic concrete.

.6 On previously sealed existing concrete floors, completely strip floor of sealers and contaminants prior to application. Apply as for freshly poured surfaces.

3.3 APPLICATION REQUIREMENTS

.1 Two applications are required. The first application at $5m^2$/litre followed by the second application at $10m^2$/litre as final coat in strict accordance with manufacturer's specifications.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

.1 This Section specifies work which shall be performed by:
Section 04 22 00: Concrete Unit Masonry

1.2 QUALITY ASSURANCE

.1 Requirements of Regulatory Agencies:
Modify requirements of the Specifications only as jurisdictional authorities may direct.

1.3 REFERENCES

.1 ASTM C270-89: Standard Specification for Mortar for Unit Masonry.
.2 CSA A179-04 (R2009): Mortar and Grout for Unit Masonry.
.3 CSA A371-04 (R2009): Masonry Construction for Buildings.
.4 CSA S304.1-04: Masonry Design for Buildings (Limit States Design).

1.4 SUBMITTALS

.1 Affidavits:
Submit to Consultants affidavits of an inspection company that mortar and grout materials conform to requirements of the Specifications, if requested.

1.5 DELIVERY, STORAGE AND HANDLING

.1 Handle and store cementitious materials protected against moisture.

.2 Handle and store all mortar materials to prevent contamination by foreign materials, and damage by freezing or excessively high temperatures.

1.6 SITE CONDITIONS

.1 Environmental Requirements:
When air temperature is less than 5° C, mix mortar as specified in CSA A371.

Part 2 Products

2.1 MATERIALS

.1 Use materials only as specified in CSA Standard A179 referenced from CSA A371 and CSA S304.1 as applicable. Ensure that water and aggregate used in mortar, other than in walls buried in earth, will cause no efflorescence.

.2 Incorporate only materials from same source in mortar exposed to view.

.3 Water: Verify that water used contains no salts to cause efflorescence.

.4 Portland Cement: to CAN/CSA-A3001, Type GU; grey colour, unless indicated

elsewhere.

.5 Masonry Cement: to CAN/CSA-A3002, Type S.

.6 Hydrated Lime: to ASTM C207, Type S-Special.

.7 Mortar Aggregate: natural sand, to CSA A179, standard masonry type; clean, dry, protected against dampness, freezing and foreign matter.

.8 Grout Coarse Aggregate: to CSA A179, maximum 10 mm size, 27 percent by volume.

.9 Grout Fine Aggregate: to CSA A179, clean well graded sharp sand; 54 percent by volume.

.10 Water: potable, clean and free of deleterious amounts of acids, alkalies or organic materials.

2.2 ADMIXTURES

.1 Plasticizer: water reducing type, reducing porosity and absorption to increase bond strength.

.2 Water Repellent: mixture of calcium carbonate and hydrous magnesium aluminum silicate powders.

.3 Colour: liquid manufactured or natural oxide pigment, colour and loading as selected by Consultant.

2.3 MIXES

.1 Mortar for Concrete Masonry Units: to CSA A179, Type S using the Proportion Specification Method c/w water repellent addition.

.2 Mortar for Calcium Silicate Masonry Units: to CSA 179, Proportion Specification Method, consisting of 1-1-6 mix of Portland cement, hydrated lime and aggregate, c/w integral colour.

.3 General: Ensure that water and aggregates used are all from same source and will meet required strengths. Batch mortar and grouts are acceptable provided source is approved prior to commencement of work.

.4 Mix mortars as specified in CSA A179. Use only dry aggregate. Test for bulking to determine accurate proportioning.

.5 Do not incorporate calcium chloride in mortar mix. In cold weather non-chloride accelerating admixtures may be utilised such as Accelguard 80 by Euclid Chemical Canada Inc., or equivalent meeting specified requirements of ASTM Specification C270.

.6 Dirt resistant additives: aluminum tristearate, calcium stearate or ammonium stearate.

.7 Use aggregate passing 1.18 mm sieve where 6 mm thick joints are indicated.

.8 Colouring Additive: A mineral-oxide pigment, harmless to mortar set and strength, shall be provided. Colour shall be one (1) colour per masonry unit type, as selected by the Consultant.

2.4 GROUT

.1 Grout in Reinforced Masonry Cores, Bond Beams and Lintels:
: 20 MPa strength at 28 days
: 175 – 200 mm slump, mixed to CSA – A179, fine grout.

Part 3 Execution

3.1 MIXING

.1 Mix mortar to consistency required for working.

.2 Mix grout to semi-fluid consistency.

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

.4 Prehydrate pointing mortar by mixing ingredients dry, then mix again adding just enough water to produce damp unworkable mix that will retain its form when pressed into ball. Allow to stand for not less than 1 hour nor more than 2 hour then remix with sufficient water to produce mortar of proper consistency for pointing.

3.2 INSTALLATION

.1 Grout fully all pockets in concrete foundation walls where structural components installed, under bearing plates at piers and elsewhere as noted on drawings.

.2 Grout solid all reinforcing installed in concrete block walls.

.3 Protect all mortar and grout installed from freezing or from excessive heat which will prevent bonding or decrease the required compressive strength.

3.3 PREPARATION

.1 Protection:
Provide waterproof protection over construction surfaces at mixing areas to prevent deposit on them of mortar and mortar materials.

3.4 MORTAR TYPES

.1 For laying concrete and brick unit masonry, use mortar type:
"S" in masonry walls in contact with earth.
"S" in masonry walls for all structural walls.
"N" in non-structural applications.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

.1 This section to be read in conjunction with Section 04 22 00 for Execution Requirements

.2 Section 01 33 00 – Submittal Procedures

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

.4 Section 05 12 23 – Structural Steel for Buildings

.5 Section 03 41 00 – Plant- Precast Structural Concrete

.6 Section 04 22 00 – Concrete Unit Masonry

.7 Section 07 21 13 – Board Insulation

1.2 REFERENCES

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

.1 ASTM C126-99, Standard Specification for Ceramic Glazed Structural Clay Facing Tile, Facing Brick, and Solid Masonry Units.

.2 Brick Industry Association (BIA).

.1 Technical Note No. 20-2000, Cleaning Brick Masonry.

.3 Canadian Standards Association (CSA International).

.1 CAN/CSA A82-06: Fired Masonry Brick Made from Clay or Shale
.2 CAN/CSA-A165 SERIES-04 (R2009): Concrete Block Masonry Units
.3 CSA-A371-04 (R2009): Masonry Construction for Buildings
.4 CAN/CSA-A3001: Portland Cement
.5 CSA-A8-M88: Masonry Cement
.6 CSA S304.1-04: Design of Masonry Structures

1.3 SUBMITTALS

.1 Product Data.

.1 Submit manufacturer's printed product literature, specifications and data sheet in accordance with Section 01 33 00 - Submittal Procedures.

.2 Manufacturer's Instructions.

.1 Submit manufacturer's installation instructions.

1.4 QUALITY ASSURANCE

.1 Test Reports: certified test reports showing compliance with specified performance characteristics and physical properties.

.2 Certificates: product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.

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.3 For clay units, in addition to requirements set out in referenced CSA and ASTM Standards include data indicating initial rate of absorption for units proposed for use.

1.5 PRODUCT DELIVERY STORAGE AND HANDLING

.1 Ensure that materials are delivered to job site in dry condition.

.2 Except where wetting of bricks is specified, keep materials dry until use.

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

1.6 COLD WEATHER REQUIREMENTS

.1 Supplement Clause 5.15.2 of CSA A371 with the following

.1 Maintain temperature of mortar between 5°C and 50°C until used.

1.7 HOT WEATHER REQUIREMENTS

.1 As per Clause 6.7.4 of CSA A37.

1.8 PROTECTION

.1 Until completed and protected by flashings or other permanent construction, keep masonry dry using waterproof, non-staining coverings that extend over walls and down sides sufficient to protect walls from wind driven rain. Use waterproof coverings draped 600 mm (min.) down each side of wall and securely anchored.

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

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

1.9 WASTE MANAGEMENT AND DISPOSAL

.1 Remove from site and dispose of packaging materials at appropriate recycling facilities.

.2 Collect and separate for disposal paper, plastic, polystyrene, corrugated cardboard, packaging material in appropriate on-site for recycling in accordance with Waste Management Plan.

1.10 JOB MOCK UP

.1 Construct mock-up panel of exterior masonry wall construction, 2000 mm x 2000 mm, showing all masonry materials and colors, fixtures, jointing, coursing, mortar and workmanship.

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Part 2 Products

2.1 MANUFACTURED UNITS

.1 **Clay Brick Masonry Units**:

.1 All units: Clay Brick, Grade "SW", passing Test Methods specified in CSA-A82. Modular size (92 mm x 57 mm x 194 mm) as manufactured by:

.2 **Field Brick:**

.1 Brampton Brick 'Glen-Gery "Château Brown" Type FBS

.3 All brick to be manufactured from single continuous run to ensure minimum colour and texture variations.

.4 Acceptable Alternates by Canada Brick or Permacon matching existing brick. Alternates must be submitted to consultant for review at time of tender during addendum period and must be approved by consultant.

.2 Portland Cement:

.1 To CAN/CSA-A3001.

.3 Masonry Cement:

.1 To CAN/CSA A8.

.4 Hydrated Lime:

.1 To ASTMC207-74.

.5 Aggregate:

.1 To CSA A82.56-M1976.

.6 Water:

.1 Ensure that water contains no salts which may cause efflorescence.

.7 Thru-wall Flashing and Air/Vapour Barrier Sheet Membrane Treatment**:** Self-adhering SBS modified bitumen membrane reinforced with non-woven fibrous glass. Acceptable materials: Blueskin TW by Bakor Inc., Mississauga or sheet air/vapour barrier membrane as specified as in Section 07 27 10 – Air Barriers.

.8 Bolts and Anchors: To CAN3-A370.

.9 Natural Mortar:

.1 Generally: Use materials only as specified in CSA A179. Ensure that weather and aggregate used in mortar, other than in walls buried in earth, will not cause efflorescence.

.2 Bonding Agent**:** Acrylic latex type by Sternson Limited, W.R. Meadows or Thoro Building Products. Use for all mortar except brick.

.3 Mixes: Mix mortars as specified in CSA A179 using the Proportion Specification. Add bonding agent in accordance with manufacturer's instructions.

.4 Mortar Types:

.1 For masonry walls in contact with earth and bedding for bearing plates and lintels: Mortar Type "S".

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.2 For load-bearing walls: Mortar Type "S".

.3 For brick: Mortar Type "N" (1:1:6) premixed "Betomix 1-1-6" Type "S" portland cement hydrated lime as supplied by Daubois Inc., Jiffy Mortar Systems. Mix on site with sand and water.

.4 For all other (non-structural) masonry walls, use regular Type "N" mortar.

.5 Grout: To CSA A179 Table 3.

.10 Mortar Dropping Control Device: "Mortar Net" manufactured by Mortar Net USA (Telephone: 1-800-664-6638).

.11 Weepholes**:** 90 mm x 90 mm x 10 mm purpose made PVC, designed to drain cavities and with mesh to prevent insects from entering. Colour to be chosen by Architect from manufacturer's full range.

.12 Date Stone: Date stone to be 390 x 390 x 90 deep solid limestone. Font: Technic Lite, 100mm high. Beveled edges. Polish finish. Location to be determined by Architect.

.13 Time Capsule Stone: Time capsule stone to be 390 x 390 x 90 deep solid limestone. Font: Technic Lite, 100mm high. Beveled edges. Polish finish. Location to be under display cabinet in Entrance Foyer. Confirm final location and exact beveled wording with Architect.

.14 Veneer Ties: Fero slotted block tie (Type II) c/w V-Tie manufactured from 4.76 mm diameter wire conforming to CSA Standard G30.3, hot dipped galvanized to ASTM A153.

Part 3 Execution

3.1 MANUFACTURER'S INSTRUCTIONS

.1 Compliance: comply with manufacturer's written data, including product technical bulletins, product catalogue installation instructions, product carton installation instructions, and data sheets.

3.2 WORKMANSHIP

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

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

3.3 TOLERANCES

.1 Clause 5.3 of CAN/CSA-A371 applies except as follows: Walls to receive thinset ceramic tile: plumb within 1:600.

3.4 EXPOSED MASONRY

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

.2 Parging on the face of exposed masonry units will be rejected.

□

3.5 JOINTING

.1 Except where indicated otherwise on drawings or details or as below, make concave joints, allow joints to set just enough to remove excess water, then tool with round jointer to provide smooth, compressed, uniformly concave joints. Where joints are to receive plaster, tile, insulation, or other applied material except paint or similar thin finish coating, strike flush.

3.6 WEEPHOLES

.1 Provide 10 x 90 x 90 mm PVC weepers at regular intervals at both top and bottom of walls as indicated on Drawings. Ensure weepers are clear and not blocked by mortar or mortar droppings.

3.7 JOINING OF WORK

.1 Where necessary to temporarily stop horizontal runs of masonry, and in building corner, Step-back masonry diagonally to lowest course previously laid. Do not "tooth" new masonry. Fill in adjacent course before heights of stepped masonry reach 1200 mm.

3.8 CUTTING

.1 Cut out neatly for electrical switches, outlet boxes, and other recessed or built-in objects.

.2 Make cuts straight, clean, and free from uneven edges. Use masonry saw where necessary.

3.9 BUILDING-IN

.1 Build in items required to be built into masonry by other trades.

.2 Prevent displacement of built-in items during construction. Check for plumbness, alignment, and correctness of position, as work progresses.

.3 Brace door jambs to maintain plumbness. Fill door frame with concrete.

3.10 WETTING OF BRICKS

.1 Except during winter, wet clay brick having an initial rate of absorption exceeding 1g/min/100mm2; wet to uniform degree of saturation, to 24 hours before laying, and do not lay until surface is dry.

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

3.11 SUPPORT OF LOADS

.1 Except where drawing requirements are more stringent, comply with Clause 6.3 of CSA S304.1.

.2 Where concrete fill is used in lieu of solid units, use minimum 25 MPa concrete to Section 03 30 00.

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.3 Install building paper below voids to be filled with concrete; keep paper 25 mm back from faces of units.

3.12 PROVISION FOR MOVEMENT

.1 Leave 5 mm space below shelf angles.

.2 Leave 6 mm space and do not use wedges between tops of non-load bearing walls and partitions and structural elements.

3.13 LINTELS

.1 Install steel lintels above windows, doors and all mechanical and electrical as shown on structural drawings. Centre over opening width.

.2 Install loose steel lintels supplied by Section 05 12 23. Centre lintel over opening width. Minimum 150 mm solid bearing each end.

.3 Lintels over 2000 mm span to be complete with bearing plate and anchors each end.

.4 Bridge openings less than 450 mm wide with 6 mm thick mild steel plate lintels, bearing minimum 100 mm on each side of opening and set on dry pack grout. Width of plate to be equal to the wall thickness less 25 mm.

.5 Install precast concrete lintels supplied under Section 03 30 00.

3.14 CONTROL AND EXPANSION JOINTS

.1 Except as noted following, control joints required at maximum of 6000 mm o.c. in continuous walls having no openings, intersections or column locations. Refer to elevations for locations on exterior walls and advise Consultant of variances prior to executing the work. Control joints are not shown for clarity on the drawings for interior walls. If in doubt, request assistance from the Consultant.

.2 At doorway locations, unless indicated otherwise on elevation drawings, use one side of doorway beyond lintel. Use building paper to prevent that end of lintel to bond.

.3 Use standard block with concrete filled end core to form key. Line one side of core with building paper before filling core to prevent bonding. Complete vertical separation, full height and thickness of wall are required.

.4 Stop masonry reinforcing at each side of the joints. Caulking specified in Section 07 92 10 – Joint Sealers.

.5 At expansion joints in brick and veneer, install Rapid Expansion joint DA 2015, to leave vertical joint free of mortar to allow for horizontal expansion.

3.15 INSPECTION & TESTING

.1 Refer to Section 01 11 00 – Summary of Work, section 1.29.

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3.16 CLEANING

.1 Perform cleaning as soon as possible after installation to remove construction and accumulated environmental dirt.

.2 On a weekly basis and at completion of work remove all debris, cut blocks and bricks, and mortar droppings.

.3 Power wash or brush exterior masonry surfaces at completion of work.

.1 Soft, clean cloths.

.4 Clean concrete brick masonry as work progresses.

.1 Allow mortar droppings on masonry to partially dry then remove by means of trowel, followed by rubbing lightly with small piece of brick and finally by brushing.

.5 Upon completion of installation, remove surplus materials, rubbish, tools and equipment barriers.

END OF SECTION

□

Part 1 General

1.1 RELATED SECTIONS

.1 This section to be read in conjunction with Section 04 21 13 for Execution Requirements.

.2 Work performed by other Sections and which is related to this Section is specified in:
Section 03 10 00: Concrete Formwork: for dovetail anchor slots in concrete, concrete lintels.

.3 Supply of work which shall be installed by this Section is specified in:

Section 05 12 23: Structural Steel for Buildings: to furnish bearing plates, steel lintels

Section 05 31 00: Steel Decking: to furnish weld plates. Miscellaneous inserts and attachment devices to support the installations of other Sections, frames and miscellaneous metal work

.4 This Section shall include performance of work which is specified in:
Section 04 05 12: Mortar and Grout

1.2 SYSTEM DESCRIPTION

.1 Tolerances:
Lay masonry to tolerances specified in CSA A371 and:
.1 Level within 6 mm in any bay or 6 m maximum distance, and 13 mm in 12 m or more.
.2 Opening sizes within 6 mm of designated dimension.
.3 With joints to dimensions indicated, but in no case greater than 13 mm.

1.3 QUALITY ASSURANCE

.1 Requirements of Regulatory Agencies:
.1 Construct masonry as required by jurisdictional authorities.
.2 Before commencing masonry work, verify that site conditions will allow construction of masonry within required limitations for wall heights, wall thickness, openings, bond, anchorage, lateral support, and compressive strengths of masonry units and mortars.
.3 Construct masonry fire rated assemblies, which are validated by UDI, ULC, or NRC fire tests, in complete accordance with the test design specification. Fire rated assemblies constructed otherwise will be acceptable only on presentation of authorization by jurisdictional authorities.

1.4 REFERENCES

.1 CAN/CSA-A165 SERIES-04 (R2009): Concrete Block Masonry Units
CAN/CSA-A370-04 (R2009): Connectors for Masonry
CAN/CSA-A371-04 (R2009): Masonry Construction for Buildings
CSA S304.1-04: Design of Masonry Structures (Limit States Design)

.2 Reference standards quoted in Contract Documents refer to: ASTM A924/A924M-95, Specification for General Requirements for Steel Sheet Metallic Coated by the Hot-Dip Process.
CAN/CGSB-37.2-M88, Emulsified, Asphalt, Mineral Colloid Type, Unfilled, for Dampproofing and Waterproofing, and for Roof Coatings.

1.5 SUBMITTALS

.1 Samples:
Submit samples of unit masonry for review.

.2 Affidavits:
Submit affidavits by an approved independent testing laboratory stating that materials supplied are in accordance with the Specifications, if requested.

1.6 DELIVERY, STORAGE AND HANDLING

.1 Isolate masonry units from contact with ground and other materials until laid, to prevent staining.

.2 Ensure that moisture content of concrete masonry units is maintained within specified limits from time of shipment from plant, to time of installation.

.3 Cover masonry unit stockpiles while stored to prevent exposure to weather. Keep water out of all holes and reglets in units during freezing weather.

.4 Handle and store masonry units to prevent soiling and chipping.

.5 Deliver products to the place on site as directed, and to meet installation schedule.

Part 2 Products

2.1 MATERIALS

.1 Meet specified requirements of CSA A370 and CSA A371 for materials unless specified otherwise.

.2 Asphalt Emulsion:
To meet specified requirements of CAN/CGSB-37.2.

.3 Joint Packing at Walls:
.1 Fire Separation Packing: at tops of fire rated walls and partitions: Thermafiber 200 degree glass fibre insulation by Canadian Gypsum Company, Limited, or Firebarrier fibre firestopping by AD Distributors Ltd.
.2 Expansion Joint Packing: Glass fibre insulation, rigid board, density of 48 kg/cu.m.; or Rodofoam by Sternson Limited, or closed cell neoprene DA2015 by Dur-O-Wal Ltd.

.4 Joint Reinforcement:

.1 Provide joint reinforcement in width to ensure that longitudinal rods at faces of wall have minimum mortar cover of 16 mm and that they are centred on shells of hollow core units.

.2 Horizontal joint reinforcing shall include longitudinal and cross rods, welded steel rod, Truss type extra heavy duty Blok-Lok BL-30 or 120 Truss-Mesh by Hohmann & Barnard Inc. Galvanizing as per Section 2.1.9.

.3 For Exterior single-wythe block wall horizontal joint reinforcement shall include cross ties hot dipped galvanized Truss type (Extra Heavy Duty). Spacing to be minimum everty 3rd course, U.N.O.

.4 For Interior Single Wythe Load-bearing Walls shall include 4.8mm cross ties mill galvanized Truss type (Extra Heavy Duty). Spacing to be as per drawings.

.5 For Interior Single Wythe Non-Load-bearing Walls provide 3.76 mm dia. longitudinal and cross rods, welded steel rod, galvanized, ladder design (Standard). Spacing shall be every second block course.

.6 All joint reinforcing to be galvanized as per 2.19 of this Section.

.5 Masonry Veneer Wall Tie (Steel Stud Back-up):

Adjustable, dual component slotted design; e.g. Fero Slotted Stud Tie (Type 1), comprised of:

.1 Slotted Stud Plate: 1.61 mm thick hot dipped galvanized steel plate to ASTM A153; length to suit air space dimension and stud width.

.2 V-Tie: 4.76 mm diameter hot dipped galvanized steel wire to ASTM A153; length to provide placement of tie legs at centerline of veneer.

.3 Fasteners: self-tapping sheet metal screws, hex washer head, suitable length to penetrate stud no less than 13 mm; minimum 2 screws per tie.

.4 Insulation Retaining Clip: purpose-made plastic, as recommended by tie manufacturer.

.6 Masonry Veneer Wall Tie (CMU Back-up):

Adjustable, dual component slotted design; e.g. Fero Slotted Block Tie (Type 1), comprised of:

.1 Slotted Block Plate: 1.61 mm thick hot dipped galvanized steel plate, to ASTM A153; length to suit air space and CMU width dimension, less 6 mm.

.2 V-Tie: 4.76 mm diameter hot dipped galvanized steel wire, to ASTM A153,; length to provide placement of tie legs at centerline of veneer.

.3 Insulation Retaining Clip: purpose-made plastic, as recommended by tie manufacturer.

.7 Wall Tie (Structural Steel Back-up):

Adjustable, dual component design; suitable for welded attachment; e.g. Blok Lok Flex o-lok ties BLT-9, hot dipped galvanized c/w V-Tie, 4.8 mm size; hot dipped galvanized, suitable length to provide placement of tie legs at central line of veneer.

.8 Strap Anchors: 6.35 mm thick steel plate, hot dipped galvanized; U-shaped and Z-shaped to suit application; e.g. BLT 11Z BY Blok-Lok.

.9 Galvanizing:

.1 For Joint Reinforcement, Bond Ties, Anchors, and Accessories in Exterior Walls:

To meet specified requirements of ASTM Specification A153 , Class B, hot dip.

.2 For Joint Reinforcement, Anchors, and Accessories in Interior Walls: above grade Manufacturer's standard mill galvanising.

.3 For Joint Reinforcement, Bond Ties, Anchors, and Accessories in interior walls below grade: To meet specified requirements of ASTM Specification A153, Class B, Hot Dip Gavanized.

.10 Reinforcing Steel:
For reinforced block lintels: to meet specified requirement of CSA Standard G30.18.

.11 Dovetail Anchor:
25 mm x 2mm formed sheet steel dovetail brick anchor galvanised, with end bent to form hook, to suit dovetail anchor slot specified for installation by formwork constructor.

.12 Weep Holes:
Plastic tube, 10mm OD x 100 mm long, or 10 mm x 38 mm x 90 mm long rectangular; or DA1069 Cell Vent by Dur-O-Wall Limited.

.13 Concrete Masonry Units:

.1 To meet specified requirements of CAN3-A165 Series – 04.

.2 Include all special shapes, such as end, bond, sash groove and lintel units, required for complete masonry installation indicated on Drawings. Use bullnose corner block at all door jambs, vertical external corners and where otherwise indicated on Drawings.

.3 Modular size units.

.4 Provide 100% solid units where required by jurisdictional authorities.

.5 Moisture controlled ("M") units acceptable to Consultant.

.6

.1 Normal Weight Units: For use in walls below ground floor elevation:
Hollow Units: H/15/A/O.
75% Solid Units: S/15/A/M.
Solid Units: Sc/15/A/O:

.2 Light Weight Units: For use in walls above ground floor elevation:
Hollow Units: H/15/C/M
75% Sold Units S/15/C/M
Solid Units: Sc/15/C/M

.7 Supply lintel blocks for fabrication of lintels by Section 03 30 00.

Part 3 Execution

3.1 PROTECTION

.1 Cover exposed tops of masonry walls when laying is not in progress and until protected by completed construction. Cover with non-staining waterproof material to overhang top edges of wall by 600 mm minimum and secured to prevent dislodgement.

.2 Protect exposed external corners of masonry with materials which will not damage or soil finished surfaces.

.3 Protect all finished surfaces from mortar droppings.

.4 Take particular care to protect faces of concrete unit masonry from mortar droppings and smears as laying proceeds.

.5 Turn over or cover scaffolds and mortar boards at completion of each day's work to avoid staining of finished surfaces by splashed rain.

3.2 LAYING MASONRY

.1 Lay masonry to meet specified requirements of CSA A370 and CSA A371, unless otherwise specified.

.2 Lay masonry to course as shown on Drawings and to minimise cutting of units.

.3 Coordinate coursing of dissimilar sized units only as approved by Consultant.

.4 Use only dry and unfrozen materials.

.5 Remove sections of masonry which have been frozen before laying of masonry continues.

.6 Lay masonry in running bond with vertical joints of alternate courses in line.

.7 Lay concrete unit masonry with thick ends of webs on top.

.8 Joints:

.1 Make joints of uniform thickness with vertical joints from course to course maintained plumb.

.2 Provide full bed and head joints for shear walls.

.3 When laying is resumed on walls previously laid with mortar either partially or totally set, remove loose units and mortar from top and adjoining surfaces. Remove mortar completely when masonry is removed and replaced with new.

.4 Form tooled concave joints wherever exposed to view, whether behind cabinets, fitments, and wall accessories, or not. When mortar has become "thumb-print" hard, tool joints and clean off burrs with trowel or burlap. Use a tool with a bearing surface of 550 mm minimum length on horizontal joints to avoid uneven depressions.

.5 Rake out joints to masonry exposed to view to provide for caulking
: at junction of interior and exterior walls with columns.
: at junction of interior with exterior walls.
: intersections of walls and partitions where joint reinforcement is installed.
: at caulked joints where indicated typically.

.9 Stop off horizontal runs of walls by racking back a half unit in each horizontal course: do not touch.

.10 Do not wet concrete units.

.11 Distribute masonry units of varying colours and textures to avoid spotty appearance over

wall surfaces exposed to view. Do not use units which contrast too greatly with overall range.

.12 Use chipped and blemished units only where concealed. Do not use defective or broken units. Do not lay concrete units with markedly smooth face that will appear slick where exposed to view, whether painted or not.

.13 Maintain bracing of walls and piers continuously during construction until structure provides support.

.14 Lintels:

.1 Build in Lintels supplied by Section 03 30 00 and 05 50 00. Set and level lintels on a bed of mortar.

.2 Build in precast concrete block lintels fabricated under work of Section 03 30 00.

.3 Provide means to prevent damage due to differential movement resulting form expansion or contraction and from deflection of lintel.

.4 Bridge openings not exceeding 450 mm in width with 6 mm mild steel plate lintels bearing 100 mm on each side of opening. Width of plate shall be wall thickness less 25 mm. Joint at lintel to be dry packed. Provide weep joints in mortar at 800 mm above lintels.

.15 Built-In Items:

.1 Verify that built-in items specified in other Sections are available for building in before laying of masonry commences. Co-operate in the setting and aligning of built-in items and provide for later installation of items which are installed by other Sections, to avoid cutting, fitting, and patching.

.2 Build masonry around pressed steel door frames supplied and set as specified in other sections. Ensure that anchors are well secured and that frames are true and plumb. Completely fill frames with mortar as each course is laid. Maintain protective frame covering and ensure that no mortar is left on frame faces.

.16 Cope, cut and split concrete masonry units with power-driven abrasive discs. Cut units wherever electrical outlets, grilles, and pipes occur. Allow 3.2 mm clearance around items which are incorporated in walls.

.17 Do not expose open cells, cores or frogs of masonry units to view.

.18 Coat faces of concrete covered with less than 200 mm of masonry veneer at exterior walls and parapets with prime coat and one dampproof coat of asphalt emulsion.

.19 Locate bearings and piers as indicated on Drawings; provide solid masonry units at bearings.

.20 Extend walls and partitions at top to deck, slab or structural members, as applicable, except where otherwise noted on Drawings. Incorporate both lateral support and deflection space at termination of walls as required by this Section. Where walls terminate at bottoms of steel joists, close space at joists to deck or slab with metal lath and plaster on one side of joist or with 16 mm thick fire rated, Type X. gypsum board secured to each side of joists, if infilling with masonry is impractical; and to meet specified requirements of Section 09 21 16. Ensure that construction at joists completely

closes and seals space.

.21 Masonry Solid Wall Anchorage:

.1 Use dovetail anchors for slots at concrete construction.

.2 Keep masonry a minimum of 12.7 mm clear of faces of structural members or as indicated on Drawings, and fill space with glass fibre board, leaving space for caulking at joints exposed to view or the weather.

.3 Bed anchors solidly in mortar joints.

.4 Fill cores of hollow units solidly with mortar where anchors are embedded.

.5 Co-ordinate with Section 031 0 00 to ensure that dovetail anchor slots in concrete are located correctly. Assist in their installation if requested.

.6 Coodinate with Section 11 52 00 locations of all wall mounted Gymnasium equipment and fill blocks solid above, below, and within mounting locations.

.22 Joint Reinforcement:

1. Install joint reinforcement in single wythe masonry walls and partitions. Place reinforcement continuously in horizontal joints spaced as noted on structural drawings, beginning with course 400 mm above bearing, unless otherwise specified or indicated.
2. Place reinforcement additionally in courses 200 mm, 400 mm and 800 mm above and below openings, and extending 600 mm beyond jambs of openings.
3. Where changes in wall thickness occur, extend reinforcement of lesser width 450 mm beyond changes of width.
4. Lap reinforcement a minimum of 150 mm at splices.
5. Do not run reinforcement through control joints.
6. Wherever walls and partitions intersect one another, or each other, continue reinforcement through. Do not carry reinforcement through intersections where lateral support anchors are installed or at intersections of walls and partitions with solid piers.
7. Bond cavity walls together with cavity-wall ties staggered in alternate course and spaced not to exceed 800 mm horizontally and 600 mm vertically. Provide additional ties spaced not more than 400 mm apart within 200 mm of openings and on each side of control and expansion joints, except where wythes are bonded together with masonry returns or otherwise.
8. Install vertical reinforcing to size and spacing as shown on Drawings. Fill voids with minimum 10 MPa grout.
9. Properly position vertical bar reinforcement in concrete masonry pilasters, columns, and walls and secure against displacement.
10. Provide two 15M size reinforcing bars grouted vertically into masonry unit cores on both sides of masonry openings. One bar per cell.
11. Solidly fill block cores containing vertical reinforcement or anchor bolts with grout.
12. Lap splices 30-bar diameters minimum. Clear distance between vertical bars and masonry units shall be 15 mm.
13. Provide 20M size reinforcing bars full height, each cell, complete with 25MPa concrete as shown on drawings.

.23 Deflection Space:

.1 Incorporate a deflection space between tops of non-load-bearing walls and partitions and structure to prevent transference of structural loads to masonry.

.2 Fill deflection space with glass fibre board compressed to 50% of original thickness to completely seal space.

.3 Co-ordinate laying of masonry with installation of lateral support specified in this Section and as provided by Section 05 50 00.

.24 Penetrations of Masonry:

.1 Fill voids of masonry to within 19 mm of structural members, pipes, ducts and conduit that penetrate masonry walls and partitions, unless otherwise indicated.

.2 Keep masonry units similarly clear of such penetrations.

.3 Finish mortar smooth at face of masonry.

.4 Pack remainder of annular void surrounding penetrating item with fire separation packing to within 12.7 mm of face of masonry to allow for sealant.

.25 Shrinkage Control Joints:

.1 Incorporate vertical shrinkage control joints in walls of which concrete masonry units are a part.

.2 Install control joints at junctions of walls and columns, at intersections of unit concrete masonry load-bearing walls, and wherever indicated on Drawings, and otherwise in wall with no openings, at a maximum spacing of 6000 mm o/c. Carry joints full height of walls.

.3 Ensure complete vertical separation through walls incorporating control joints. Make control joints 9.5 mm wide, rake back 19 mm at junctures with concrete, and leave joints free and clear for caulking, as specified in Section 07 92 10.

.4 Construct control joints of standard block and fill void between block with 20 MPa concrete grout to form a continuous key full height of joint by installation of continuous building paper between concrete key and block on one side of joint.

.26 Expansion Joints:

.1 Incorporate expansion joints in walls where indicated on Drawings.

.2 Maintain expansion joints free of mortar with temporary filler when laying masonry. Pack joints full height with glass fibre board compressed to 50% of original thickness.

.3 Leave clean space in joints for caulking as specified in Section 07 92 10.

.27 Fire Separations:

.1 Construct fire separation walls tightly to construction at perimeter, and without openings or voids.

.2 Do not reduce the thickness of masonry fire separations to less than the thickness indicated for the required fire separation rating.

.3 All load bearing and non-load bearing partitions shall carry to the underside of structure above.

.4 All openings in partitions, even above ceilings shall be patched to maintain sound and fire separation.

.5 In partitions and walls not required to be fire separations, fill space between partitions and structural elements with rock wool compressible filler to maintain complete sound separation.

.6 In fire separations, spaces to be firestopped in accordance with Section 07 84 00 – Firestopping.

.7 Use U.L.C. labeled mortar for all patching in fire separations.

.28 Lateral Support Anchors:

.1 Vertical:

.1 At intersecting and abutting load bearing walls, use prefabricated corners and tees to match horizontal reinforcing.

.2 At intersection of non-load bearing walls with load bearing or non-load bearing walls, use corrugated galvanized ties.

.3 At wood parapet and similar conditions, use model BL404 with BLT9 ties, all by BlokLok. Ensure ties extend a minimum of 50 mm into the brick or block outer wythe.

.29 Bonding

.1 Walls of two or more widths: bond using metal ties in accordance with subsection 5.6 of CAN3-A371.

.2 Submit procedure and obtain approval by Architect.

.3 In cavity walls, keep all cavity spaces free of mortar and debris by placing a wood strip on the ties. Retain strip on a wire line and pull up level and clean off droppings prior to placing next course of ties. Install mortar control device at 300 mm o.c. horizontally, in a staggered pattern so as to overlap each other on each side. Install in every 2nd course above foundation and shelf angles.

.30 Thru-wall flashing and Thru-wall Building Paper at Control Joints

.1 Install thru-wall flashing at ground floor elevation in all walls on foundations.

.2 Leave 2” (50 mm) of thru-wall flashing or building paper hanging, projecting off all lintels and all required locations. Architect will review prior to cutting.

.3 Cutting protruding flashing: This procedure is to ensure that thru-wall flashing is installed where intended.

.31 Base Course Detail

.1 Provide square base block in areas of porcelain tile installation for porcelain cove base and fitted corners. Contractor to grind upper 50mm of block corner to match upper courses of bullnose block walls Refer to Details

.32 Cold Weather Protection

.1 Refer to the Ontario Masonry Contractor's Association's provision and publications. Include for tarped heated enclosures, heated mortar mixing pans - no non-freeze additives such as calcium will be tolerated on this project.

3.3 ADJUSTMENT AND CLEANING

.1 Patch damaged masonry in walls which have been rejected as unacceptable.

.2 Point all holes in mortar joints except weepholes.

.3 Point all voids in concrete unit masonry faces.

.4 Cut out defective mortar joints to a minimum depth of 13 mm and repoint.

.5 Clean concrete masonry units with dry brushes and as otherwise recommended by the supplier to remove mortar and stains.

.6 Do not use wire brushes for cleaning.

.7 Should specified cleaning methods be insufficient, proceed with other methods only with approval.

.8 Protect adjacent materials, construction and finished surfaces from damage while cleaning.

.9 Ensure that all efflorescence and mortar deposits are removed from surfaces to receive coating.

END OF SECTION

Part 1 General

1.1 GENERAL REQUIREMENTS

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

1.2 WORK IN OTHER SECTIONS

.1 Related Work Specified in Other Sections

Section 03 30 20 – Cast-in-Place Concrete
Section 04 20 00 – Unit Masonry
Section 05 30 00 – Metal Decking
Section 05 50 00 – Miscellaneous Metal
Section 07 41 00 – Preformed Metal Panels & Siding
Section 07 51 00 – Insulated Built-up Bituminous Roofing
Section 08 10 00 – Metal Doors and Frames
Section 08 40 00 – Aluminium Doors, Frames & Windows
Section 09 90 00 – Painting
Division 15 – Mechanical
Division 16 – Electrical

.2 Products Supplied Under Work of this Section
and Installed Under Work of Other Sections

Section 03300	:	To install anchor bolts and loose bearings plates
Section 04200	:	To install anchor bolts, loose bearing plates & anchors
Section 04200	:	To install loose lintels

1.3 REFERENCE STANDARDS

CSA S16-14: Design of Steel Structures
CSA W59-13: Welded Steel Construction (Metal Arc Welding)
CSA G40.20-13: General Requirements for Rolled or Welded Structural Quality Steel
CSA G40.21-13: Structural Quality Steel
CSA W48-14: Filler Metals and Allied Materials for Metal Arc Welding
CAN/CSA G164-M92 (R2003): Hot Dip Galvanizing of Irregularly Shaped Articles
ASTM F3125/F3125M-15a: Standard Specification for Structural Bolts, Steel, Heat Treated 830 MPa Minimum Tensile Strength
The Ontario Building Code, (O. Reg. 332/12)

1.4 SOURCE QUALITY CONTROL

.1 Submit 2 certified copies of mill reports covering chemical and physical properties of steel used in this work.

.2 Submit affidavits from the manufacturer or fabricator that materials supplied comply

with this Specification.

.3 All double chord trusses, open web steel joists and long span steel joists are to be inspected by an independent inspection company in accordance with Division 1. Inspection is to be conducted at the premises of the fabricator, prior to delivery, and is to include verification of materials used, sizes and dimensions of members, welding, alignment, camber, paint coverage and general workmanship. All joists are to be designed for the loads and spans indicated on the Drawings. Submit copies of design shop drawing complete with the Engineer's stamp, dated and signed.

.4 At least one-third of the joists are to be fabricated and ready for delivery prior to calling the inspection company, thus limiting the number of visits required to three (3). All deficiencies are to be corrected prior to delivery.

.5 The Owner will appoint an independent inspection and testing company to ensure that the Work of this Section is performed in accordance with the Specifications. The cost of all inspections/testing shall be paid for from the cash allowance allocated for this in Section 01050 - Allowances.

1.5 DESIGN OF DETAILS AND CONNECTIONS

.1 Design details and connections in accordance with requirements of CAN/CSA-S16, latest edition, to resist forces, moments and shears indicated.

.2 For non-standard connections, submit sketches and design calculations stamped and signed by qualified professional Engineer registered in the Province of Ontario.

.3 For standard connections, select details from CISC Handbook of Steel Construction to ensure structural adequacy.

.4 Submit shop fabrication details stamped and signed by a qualified professional licensed in the Province of Ontario.

1.6 SHOP DRAWINGS

.1 Submit shop drawings in accordance with Section 01300 Submittals.

.2 Indicate shop and erection details including cuts, copes, connections, holes, bolts and welds. Indicate welds by welding symbols defined in CSA-W59-13.

.3 Submit copy of erection drawings to the Consultant for review and reference.

.4 Submit all weld procedures pertinent to the work prior to or along with the first submission of shop drawings, for subsequent review and acceptance by the Consultant.

1.7 STORAGE AND HANDLING

.1 Handle all materials with the necessary care to prevent damage to fittings, finishes and alignments.

.2 Materials damaged due to faulty storage or handling shall be repaired or replaced, without additional expense to the Owner, all to the satisfaction of the Consultant.

.3 Replace promptly all items verified as received in a damaged condition.

1.8 EXAMINATION

.1 Examine surfaces with which Work is to be anchored or connected.

.2 Report to the Consultant, all unsatisfactory conditions likely to prevent or prejudice the proper installation of the work.

.3 Commencement of Work implies unconditional acceptance of substrate and surface and condition to which all members are to be anchored and secured.

1.9 QUANTITY OF ITEMS

.1 Where a component, device, item or part of material is referred to in the singular number, such reference shall mean as many as are required to complete the work.

Part 2 Products

2.1 MATERIALS

.1 Structural steel: to CAN/CSA-G40.21 Grade 350W for rolled sections and plates, Grade 350W for Hollow Structural sections.

.2 Anchor bolts: to CAN/CSA-G40.21, Grade 300W.

.3 Bolts, nuts and washers: to ASTM A325M.

.4 Welding materials: to CSA W48 Series.

.5 Shop paint primer: to CGSB 1-GP-40M. Refer to Formulas in Section 09900.

.6 Hot dip galvanizing: galvanize steel, where indicated, to CAN/CSA G164, minimum zinc coating of 600 g/m^2.

Part 3 Execution

3.1 INSPECTION AND COORDINATION

.1 The Contractor shall field check all dimensions and elevations affecting his trade at the site. All discrepancies shall be reported to the Consultant before proceeding with the work.

.2 The Contractor shall report in writing all defects in the work prepared under other sections of the Specifications which will affect the work of this Section. Commencement of the work will

imply acceptance of previously prepared work.

.3 Verify all requirements and dimensions of existing, proceeding and following Work before commencing fabrication.

3.2 FABRICATION

.1 Fabricate structural steel, as indicated, in accordance with CAN/CSA-S16 and in accordance only with reviewed and stamped shop drawings.

.2 Supply fastenings, anchors and accessories required for fabrication and erection of Work. Make exposed metal fastenings and accessories of same material, texture, colour and finish as base metal on which they occur unless otherwise shown or specified. Keep exposed fastenings to absolute minimum and inconspicuous, spacing them evenly and setting them out neatly. Make fastenings of permanent type.

.3 Beams shall be rolled sections, combined as noted. Beam connections shall be standard double angle clip type, developing full strength of all the members.

.4 Clean all steel members by scraping, wire brushing or other effective means to remove loose mill scale, rust, oil or other foreign matter. Surfaces shall be thoroughly dry before painting.

.5 Apply one (1) shop coat of paint, conforming to CGSB 1-GP-40D primer, to all surfaces except surfaces to be in contact with or encased in concrete and surfaces and edges to be field welded or high tension bolted.

.6 Apply two (2) shop coats of paint, conforming to CGSB 1-GP-40D primer to all surfaces which will be inaccessible after assembling. Touch up all bolts, welds and surfaces of connecting members damaged during construction.

.7 All steel exposed to weather including steel lintels in exterior walls shall be hot dip galvanized.

.8 All members shall be assembled true and without twists or open joints. Shop connections shall be welded.

.9 High tensile bolted connections, where used, shall be in accordance with CAN/CSA-S16 latest edition. Holes shall be accurately spaced and of size to allow insertion of bolts of 1.5 mm (1/16") diameter less than hole diameter.

.10 Welding shall be executed so as to avoid damage or distortion to the work. Welds on exterior work shall be continuous to provide proper weathering; all welds on exposed finished work shall be ground smooth.

.11 There shall be no burning of holes in members in the shop or field without the permission of the Consultant. If consent is given, burned members shall be finished to an acceptable appearance.

.12 Mark materials in accordance with CAN/CSA-G40. Do not use die stamping. If steel is to be

left in unpainted condition, place marking at locations not visible from exterior after erection. Shop mark bearing assemblies and splices for fit and match.

3.3 ERECTION

.1 Erect structural steel as indicated in accordance with CAN/CSA-S16 latest edition and in accordance with shop drawings.

.2 Continuously seal members by continuous welds where indicated. Grind smooth.

.3 Obtain written permission of the Consultant prior to field cutting or altering of structural members.

.4 Touch up shop primer to bolts, rivets, welds and burned or scratched surfaces at completion of erection.

.5 Erection of structural steel on site shall be properly co-ordinated by the Contractor with the work of all other trades. Co-ordinate the work to incorporate all electrical appurtenances, and protect same from damage during erection.

.6 Bolted assemblies for base connections shall not be tightened until at least 72 hours after the grout pad has been placed.

.7 All bolts shall be tightened by using a suitable torque wrench, torquing as required in CAN/CSA-S16 latest edition.

.8 Damaged work will not be accepted on site. Damaged work arriving on site will be returned to the shop for repair and/or refinishing.

.9 All temporary supports shall be attached to the work in such a manner so as not to mar the surface on the finished section.

.10 All steel shall be set accurately to the lines and elevations shown on the Drawings.

.11 Assume full responsibility for the correct plumbing, alignment and setting of all members; set all guys, braces, etc., necessary to maintain the structure during erection, and until such time as the work of other trades is in place.

3.4 OPEN WEB STEEL JOISTS

.1 Minimum bearing, unless otherwise detailed, shall be 63.5mm (2½") on steel and 100mm (4") on concrete or masonry. Where joists span from one side only they shall bear directly over centre of beam unless otherwise shown. Open web steel joists and their design shall conform to CAN/CSA-S16 latest edition.

.2 Shoes are to be designed so that the allowable bearing pressure on the supporting material is not exceeded.

.3 Provide bridging in accordance with CAN/CSA S16 latest edition.

.4 Extend and if necessary deepen top chords of joists with cantilevered ends to carry the specified

loading indicated or implied.

3.5 LONG SPAN STEEL JOISTS

.1 Design, supply and erect long span steel joists in accordance with the manufacturer's published standards and this Specification. Design joists to safely withstand the total dead and live load per linear foot indicated on the Drawings. Provide cross bridging, bottom chord extensions, framing for openings, anchors, welded anchorage, bolts at bearings, and all other accessories indicated or required.

3.6 DOUBLE CHORD TRUSSES

.1 Fabrication, welding and splicing of double chord trusses is to be strictly to the details shown on the drawings. Dimensions, weld sizes and details shown are critical and excessive deviations will not be accepted.

END OF SECTION

Part 1 General

1.1 GENERAL REQUIREMENTS

.1 The Contractor shall ensure that no asbestos containing materials are used in connection with the work of this section.

1.2 RELATED SECTIONS

.1 Section 04 22 00 - Concrete Unit Masonry

.2 Section 05 10 00 - Structural Steel and OWSJ Framing

1.3 REFERENCE STANDARDS

CSA S136-12: North American Specification for the Design of Cold-Formed Steel Structural Members.
CSA W59-13: Welded Steel Construction (Metal Arc Welding)
CSA W47.1-09 (R2014): Certification of Companies for Fusion Welding of Steel
CSA W48-14: Filler Metals and Allied Materials for Metal Arc Welding

.1 Work of this section shall conform to CSA-S136-16 and to meet the specified requirements of the Canadian Sheet Steel Building Institute "Standard for Steel Roof Deck" and "Standard for Steel Floor Deck".

.2 Welding shall meet requirements of CSA-W59-13 and undertaken to meet requirements of CSA-W47.1-09 (R2014) and CSA-W55.3-08 (R2013)

1.4 DESIGN REQUIREMENTS

.1 Metal deck shall be of suitable design and thickness to safely support the indicated live and dead loading over the spans shown without exceeding the maximum working stress of 143.8 MPa.

.2 Wherever structural framing permits, steel deck shall be designed and fabricated to span continuously over at least 4 supports (3 spans).

.3 Provide an adequate increase in thickness of metal to compensate for continuity wherever fewer supports may occur.

.4 Steel deck and connections to steel framing to carry dead, live and other loads including lateral loads, diaphragm action, and uplift as indicated.

.5 Deflection under specified live load not to exceed 1/240 of span for roofs and 1/360 for floors.

.6 Metal roof deck and composite concrete slab sections shall have a depth not less than 38mm.

1.5 SHOP DRAWINGS

.1 Submit erection drawings in accordance with directions.

.2 Fabrication shall not commence until drawings are reviewed.

.3 Indicate deck plan, profile, dimensions, base steel thickness, metallic coating designation, connections to supports and spacings, projections, openings, reinforcement details and accessories.

.4 When requested shop drawings are to bear the Seal and Signature of the Licensed Professional Engineer responsible for the design.

.5 When requested submit design calculations complete with Stamp and Signature of the responsible Professional Engineer.

.6 Allow ten (10) working days for the review of shop drawings and supply as many copies for review and distribution as directed. Shop drawings shall be checked in detail by the General Contractor before submission. Drawings which fail to meet this requirement shall be returned marked NOT REVIEWED.

.7 The review of such drawings shall not relieve the Contractor of the responsibility of seeing that this work is complete, accurate and in conformity with the drawings and the specification.

Part 2 Products

2.1 MATERIALS

.1 STEEL SHEET to ASTM A653/A653M (Structural quality) grade 230 with a base nominal thickness (BNT) as noted on the drawings.

.2 ZINC COATING

.1 Unless otherwise noted, provide a ZF 275 coating as designated by ASTM A653/A653M.

.2 Deck surfaces which are designated for finish painting (Refer to Architectural Drawings & Finish Schedules) shall not receive chemical treatment that will adversely affect paint application.

.3 TYPES OF DECKING:

.1 Roof deck: Shall be single fluted element with ribs of depth as shown on the drawings.

.2 Acoustic Deck: shall be single fluted elementary with ribs of depths as shown on drawings and with perforations on the vertical faces of the flutes complete with a sound absorbing strip [fibreglass density 17.6 kg/m³ (1.1 lb/ft³)] supplied by the deck fabricator for installation by the roofing contractor.

.3 Deck shall have interlocking side joints between panels.

.4 CLOSURES:

.1 Provide cover plates, edge stiffeners, cell closures and flashings from sheet steel similar to decking with a base nominal thickness of 0.76 mm. (Refer to Architectural Drawings).

.2 Provide and install closures at the top of all walls. Type to match the profile and finish of selected decking.

.5 PRIMER: to conform to CAN/CGSB-1.181

.1 Acceptable Product - GALVAFROID by Meadows

.6 PRE-FINISH: to conform to CAN/CGSB-1.181

.1 Acoustic deck for Library to be factory applied finish. Colour to be selected by Architect.

.7 METAL UPSTANDS/CURBS:

.1 Where required by the Architectural Drawings provide and install 1.6 mm (16 gauge) galvanized metal upstands.

Part 3 Execution

3.1 PREPARATION

.1 Verify the location and condition of all bearing surfaces placed by others. All such surfaces shall be at the elevation called for on the drawings.

.2 Commencement of erection implies acceptance of the work of other sections, which affect the work of this section.

.3 No claim for relief from contractual responsibility or for extras to the contract will be allowed unless such claim is made in writing prior to commencement of the work.

.4 Protect steel deck during shipping and handling in accordance with CSSBI standards.

.5 The steel deck welder must be certified to CSA W47.1 for fusion welding of steel deck.

3.2 FABRICATION & ERECTION

.1 Conform to CSA S136, CSA W59, CCSBI 10 M.

.2 Erect Steel Decking as indicated to manufacturer's direction and to reviewed shop drawings.

.3 Accurately align the deck and lap at supports. 50 mm (2") minimum.

.4 Supply and place steel packing as required to produce an even bearing pressure at supports.

.5 Any material which has been damaged shall be replaced at no expense to the owner.

.6 Provide for ribs to bear on beams parallel to flutes when tops of such beams are at same elevation as deck bearing.

.7 Provide reinforcing stiffeners for unsupported edges of metal deck.

.8 Install 50 x 50 x 6 mm steel angles or formed channels perpendicular to flutes, welded to 2 flutes each side of opening for deck openings from 150 mm 450 mm in size.

.9 For deck openings over 450 mm and for areas of concentrated load, reinforce in accordance with structural framing details.

.10 Install closures and upstands as shown on drawings and reviewed shop drawings.

.11 After alignment and levelling and unless otherwise noted on drawings, the minimum attachment for steel deck to the bearing surfaces shall be:

- .1 The first, third and fifth low corrugations, 300 mm (12") maximum centers and each side of each sheet, are spot welded with 20 mm (3/4") nominal top diameter.
- .2 Side laps of adjacent units shall be crimped together at 450 mm (18") centres.
- .3 Side (edge) conditions shall be welded with 20 cm (3/4") welds at 600 mm (24") maximum spacings.

.12 Immediately after decking is permanently secured in place, where top and/or bottom surfaces have been burned by welding or where surface coating has been damaged during transit or in erection.

- .1 Touch-up galvannealed surfaces with specified coating.

.13 Where pre-finished acoustic deck is specified, provide mechanical fasteners equivalent to spot welding specified at other roof areas. Submit mechanical fastener type and methods to Engineer for approval prior to start of construction.

3.3 FIELD QUALITY CONTROL

.1 General

.1 Routine inspection and testing of materials and erection shall be carried out by an independent Inspection and Testing Company appointed by the Owner, and be paid for out of Cash Allowances.

.2 Any testing or inspection required by the Consultant because of an error or due to a departure from the contract documents by the Contractor shall be paid for by the Contractor.

.2 Routine Inspection

.1 Field Inspection of welded and/or screwed joints.

.2 General inspection of field cutting and alterations required by other trades.

.3 General inspection of shop priming and field painting as to quality of materials and workmanship.

.3 Specific Inspection

.1 Profile of section, gauge of deck and steel grade.

.2 Thickness of zinc coating.

.3 Fusion welds, side connections.

.4 Bearing of steel deck.

.4 Reports

.1 Distribute copies of all reports for shop and field work as directed.

END OF SECTION

Part 1 General

1.1 GENERAL REQUIREMENTS

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

1.2 WORK IN OTHER SECTIONS

.1 Related Work Specified in Other Sections
Section 03 30 00 – Cast-in-Place Concrete
Section 04 20 00 – Unit Masonry
Section 05 12 00 – Structural Metal Framing
Section 05 50 00 – Miscellaneous Metal

1.3 DESCRIPTION OF WORK

.1 Provide labor, material, equipment and services required to furnish and install metal floor deck and accessories shown on drawings or specified.

1.4 SUBMITTALS

.1 Shop Drawings
- .1 Submit completely detailed shop drawings to the Consultant for review prior to fabrication and shipment. Drawings shall indicate material thickness (not gauge), finish, fastening methods for deck units, accessories, closure pieces, fittings, size and location of framing supports and type of sequence of connections.
- .2 Location, lengths and markings of deck units shall correspond with sequence of installation. Accessories shall be fully detailed.

.2 Mill Certificates
- .1 Mill Certificates from the sheet steel coil and producer's testing and inspection report shall be submitted for review.

1.5 QUALITY ASSURANCE

.1 Deck units shall be designed and manufactured according to CSA Standard CAN3-S136-M84 and Canadian Sheet Steel Building Institute Standard 12M-84.

Part 2 Products

2.1 COMPOSITE FORM DECK

.1 Fabricate from metallic coated sheet steel conforming to CSSBI 101M-84 with minimum yield strength of 230 MPa, 38 mm deep.

.2 Galvanizing of sheet steel shall be by hot-dip process and shall conform to ASTM designation A525, coating class G90.

2.2 FABRICATION

.1 Deck unit shall be cut to lengths required so end joints occur on supporting structural members with minimum lap of 50 mm.

2.3 ACCESSORIES

.1 Cover plates shall be of the same material gauge as decking or of greater thickness, if required. Closures shall be tight to prevent leakage of concrete. Form to match deck contour, minimum 150 mm wide.

.2 Column flashing shall be provided to close spaces between floor units and columns, weld in place.

.3 End closures shall be provided to close open ends of cells at columns, walls, and openings in floor.

.4 Closures shall be provided for closing voids between cells over partitions that are perpendicular to direction of cells. Closures may be rubber or steel metal. Closures above fire-resistant partitions shall be sheet metal at both sides of partition. Fibrous glass insulation shall fill spaces between pair of closures.

.5 Provide angles and other steel members not designated as structural steel or miscellaneous metal work but which are required for a complete and rigid deck installation.

.6 Provide flat cover plate of same material gauge as decking or of greater thickness to cover transition areas of roof deck with opposing slope (valleys) warrant cutting of deck. Minimum width shall be 300 each side of joint.

2.4 SHEAR CONNECTIONS

.1 Headed stud type, ASTM A108, Grade 1015 or 1020, cold finished carbon steel, with dimensions conforming CAN3-S16.1-M84.

Part 3 Execution

3.1 INSTALLATION OF COMPOSITE METAL DECK

.1 Do not start placing of floor deck units until supporting members are in place and secured. Adjust to final position with ends bearing on supporting members, ends of adjacent units staggered, and accurately aligned end to end, before fastening permanently. Lap side joints by interlocking rib edges of adjacent units. Place and align floor deck units so as to maintain required number of units indicated on reviewed shop drawings.

.2 Install deck units in strict accordance with manufacturer's recommendations, as indicated on reviewed shop drawings, and as follows:-

.1 Lay units to span three or more support spacings, shingle fashion, with ends telescoping and lapped a minimum of 50 mm directly over bearings, with side ribs

lapped.

.2 Ends of adjacent form units shall be staggered on supporting members so that butt ends are not terminated on one member, except at slab edges or at openings.

.3 Form units shall start and terminate at the center of supporting members at ends of runs, at openings, or elsewhere as shown on the reviewed shop drawings.

.3 Provide metal closures at open, uncovered ends and edges of floor deck, weld in place, to provide rigid installation. In addition, provide metal closures in voids between metal floor deck units and top of walls and partitions, where so indicated on drawings.

.4 Fastening

.1 Steel units shall be placed on supporting steel framework and adjusted to final position before being permanently fastened. Panels shall be welded to steel framework at ends and intermediate supports by 20 mm diameter puddle welds at 300 mm centers. Where two sections are combined to form a cellular panel, the panels shall be structurally resistance welded to develop their full section properties. Side closures of panels shall be tack welded at minimum of 900 mm centers. End closures shall be tack welded at minimum 1200 mm centers. Cut and place column closures.

.2 Comply with aws requirements and procedures for manual shielded metal arc welding, appearance and quality of welds, and methods used in correcting welding work.

.5 Accessories

.1 Provide sheet metal cover plates as required to close panel end conditions, where panels change direction or abut. Provide material for column closures to close openings between panels and columns.

.2 In areas of suspended ceiling, hanger lip tabs shall be provided at 1200 mm centers along entire length of panel joint. Hanger tabs shall be for the use of ceiling suspension. Tabs shall be hooked over male leg before female leg of the next panel is placed over it. Tabs shall be designed so that they can be moved along panel joint after erection and until concrete is poured.

3.2 CUTTING AND REINFORCING OPENINGS

.1 Provide holes in the floor deck as required for the passage of pipes, duct and structural supports, equipment and other openings, and similar construction. Furnish and install steel angle framing at two sides of such openings where the structural capacity of the deck is impaired by cutting of one full rib or more, where building framing is not provided. Use angles 450 mm longer than the opening width, placed at right angles to the deck ribs, welded to the bottom of each rib.

.2 Install floor deck to provide an even top surface, ready to receive concrete fill. Trim deck to fit closely to adjacent construction, and force lap joints into tight contact. Installation shall prevent flow of concrete cement through floor deck joints.

3.3 CLEANING AND TOUCH-UP PAINTING

.1 Upon completion of floor deck installation, clean top and bottom surfaces of mud, dirt, weld spatters and other contaminants. Wire brush, clean, and touchup paint all scarred areas on top and bottom surfaces of deck to leave deck in good condition ready for subsequent construction. Scarred areas include welds, welds scars, abraded surfaces, bruises and rust spots. Use rust-inhibitive prime paint, on painted surfaces, of same kind as used in the shop. At phosphatized finished surfaces, wire brush and leave ready for concrete placement, as provided in section 03010 of specification.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

.1 Section 01 33 00 – Submittal Procedures

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

.3 Section 04 21 13 – Masonry

.4 Section 05 12 23 – Structural Steel

.5 Section 05 21 00 – Steel Joist Framing

.6 Section 05 31 00 – Steel Deck

.7 Section 09 91 22 – Painting

1.2 REFERENCES

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

.1 ASTM A53/A53M-02, Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated Welded and Seamless

.2 ASTM A269-02, Specification for Seamless and Welded Austenitic Stainless Steel Tubing for General Service

.3 ASTM A307-02, Specification for Carbon Steel Bolts and Studs, 60,000 PSI Tensile Strength

.2 Canadian General Standards Board (CGSB)

.1 CAN/CGSB-1.40-97, Anti-corrosive Structural Steel Alkyd Primer

.2 CAN/CGSB-1.181-92, Ready-Mixed, Organic Zinc-Rich Coating

.3 CISC/CPMA 1 – 73B, Quick Drying, One-Coat Paint for Use on Structural Steel

.4 CISC/CPMA 2 – 75, Quick Drying, Primer for use on Structural Steel

.3 Canadian Standards Association (CSA International)

.1 G40.20-04: General Requirements for Rolled or Welded Structural Quality Steel

.2 G40.21-04 (R2009): Structural Quality Steel

.3 CAN/CSA G164-M92 (R2003): Hot Dip Galvanizing of Irregularly Shaped Articles

.4 CSA S16.1-09: Limit States Design of Steel Structures

.5 CAN/CSA – S136-07: North American Specification of the Design of Cold-formed Steel Structural Members

.6 CSA W47.1-09: Certification of Companies for Fusion Welding of Steel

.7 CSA W59-03 (R2008): Welded Steel Construction (Metal Arc Welding)

.8 CSA NSS.3-1965 (r2003): Resistance Welding Qualification Code for Fabricators of Structural Members in Buildings

.4 The Environmental Choice Program

.1 CCD-047a-98, Paints, Surface Coatings

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.2 CCD-048-98, Surface Coatings - Recycled Water-borne

1.3 SUBMITTALS

.1 Shop Drawings

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

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

1.4 DELIVERY, STORAGE, AND HANDLING

.1 Packing, Shipping, Handling and Unloading:

.1 Deliver, store, handle and protect materials in accordance with manufacturer recommendations.

.2 Storage and Protection:

.1 Cover exposed stainless steel surfaces with pressure sensitive heavy protection paper or apply strippable plastic coating, before shipping to job site.

.2 Leave protective covering in place until final cleaning of building. Provide instructions for removal of protective covering.

1.5 WASTE MANAGEMENT AND DISPOSAL

.1 Remove from site and dispose of packaging materials at appropriate recycling facilities.

.2 Divert unused metal materials from landfill to metal recycling facility approved by Consultant.

Part 2 Products

2.1 MATERIALS

.1 Steel sections and plates: to CSA-G40.20/G40.21, Grade 350W for hollow structural sections Class H and Grade 300W for Plates and Flat Shapes.

.2 Welding materials: to CSA W59.

.3 Bolts and anchor bolts: to ASTM A307.

.4 Stainless steel tubing: to ASTM A269, Type 316 alloy, Seamless welded with AISI No. 4 finish.

.5 Grout: non-shrink, non-metallic, flowable, 15 MPa at 24 hours.

2.2 PRIMERS, COATINGS AND SHOP PAINTING

.1 Interior Steel in Dry Areas: Quick drying oil alkyd conforming to CISC/CPMA 2.75.

.2 Exterior Steel, Interior Steel in Unheated Areas, Steel Embedded in Concrete**:** Hot dip galvanized conforming to CSA G164, minimum Z275 coating. Galvanizing of structural steel components and loose lintels: refer to Section 05 12 23.

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.3 Galvanized Coating Touch-Up**:** W.R. Meadows "Galvafroid" or Kerry Industries "Z.R.C." zinc rich coating or similar manufacturer containing minimum 90% zinc by weight.

.4 Apply two (2) shop coat(s) of primer or coating as indicated above and according to manufacturers recommendations. Do not prime aluminum, stainless steel or those components to be galvanized or encased in concrete.

.5 Use primer unadulterated, as provided by manufacturer. Paint on dry surfaces free from rust scale and grease. Do not paint when temperature is lower than 10 deg. Celsius and rising.

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

2.3 FASTENINGS

.1 Use nuts and bolts conforming to ASTM A307, A325, and A563 as applicable.

.1 For interior work, use cadmium-plated fastenings where other protection is not specified.

.2 For exterior work, use Type 300 or 400 stainless steel.

2.4 ANCHORS AND SHIMS

.1 For exposed anchorage of aluminum, if applicable, use stainless steel and otherwise to match metal anchored. For non-exposed work, anchors and shims may be galvanized steel.

2.5 PIPE

.1 To ASTM A53, extra strong steel pipe for bollards.

2.6 BITUMINOUS PAINT

.1 Alkali-resisting to meet specified requirements of CAN/CGSB-1.108, Type 2. Use to insulate contact between dissimilar metals.

2.7 FABRICATION

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

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

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

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

.5 Weld all connections where possible, and bolt where not possible unless indicated otherwise on drawings.

.6 Weld all stainless steel by the Argon Arc Process. Grind smooth and polish joints, crence-free, and flush without seams.

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2.8 LIST OF MISCELLANEOUS METAL FABRICATIONS

.1 This Section includes, but is not limited to the following list. Note: Galvanize all exterior items and other items noted. Prime paint all interior items.

.1 Anchors, Bolts, Inserts, Sleeves for work in this Section.
.2 Miscellaneous angles at edges of exposed ceilings to cover insulation in deck flutes.
.3 Bench Supports and Shelf Brackets (see ADs).
.4 Steel Stairs, railings, handrails.
.5 Fire route gate (see ADs).
.6 Elevator pit ladder.
.7 Bollards (see ADs).
.8 Hangers and Supports (for work in this Section).
.9 Lintels (if not by Structural Steel).

Part 3 Execution

3.1 GENERAL

.1 Supply and install all miscellaneous metal work indicated on the Drawings and not indicated in work of other Sections in addition to items listed below.

3.2 ERECTION

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

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

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

.4 Exposed fastening devices to match finish and be compatible with material through which they pass.

.5 Provide components for building by other sections in accordance with shop drawings and schedule.

.6 Make field connections with bolts to CSA-S16.1, or weld.

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

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

.9 Touch-up galvanized surfaces with zinc rich primer where burned by field welding. Spray or brush apply a minimum of three (3) coats of zinc-rich paint to achieve a dry film thickness of 8 mils. Apply a finish coat of aluminum paint to provide a colour blend with the surround galvanizing.

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3.3 WALL BENCHES AND UPPER SHELF

.1 Steel Angles, Steel Channel, Flat Bar Steel, Steel Rod as indicated on details.

.2 Use secure round head fasteners or countersink holes for flat head screws.

.3 Prime paint: Galvafroid.

.4 Chamfer cut ends of Rod 2 mm.

.5 Refer to AD drawings.

3.4 STEEL STAIRS

.1 Refer to Structural Drawing for Stair Construction Components. The sizes shown on structural drawings are minimum sizes. The stairs and its components shall be designed and certified by Fabricator's design Engineer licenced in the Province of Ontario.

.2 Refer to Drawing A20 for dimensions, location, and guardrail details.

.3 Note: install stairs, handrails, plumb, level, rigid and secure, as per details shown on Drawings.

.4 Provide shop drawings indicating profiles, sizes, connections, anchorage, etc. stamped and certified by a Professional Engineer (P. Eng.). The Engineer shall visit the site on periodic basis during construction, report in writing for each visit and upon completion of work, and provide a certificate stating that the work was performed in general conformance with the drawings and specifications.

3.5 GATE

.1 Welded steel pipe construction, as shown on AD 218 drawing. Galvanize after fabrication.

.2 Provide post & wheel to vehicle gate to prevent sagging.

3.6 ACCESS STAIR & LADDER

.1 Fabricate interior and exterior roof access ladders as described on drawings AD 515 & AD 517. Typical Construction is detailed on Structural Drawings.

3.7 WALL BRACKETS AND HOOKS

.1 As shown on Drawings - prime paint.

3.8 BOLLARDS

.1 Supply and install galvanized steel bollards as shown on Drawings. Bollards shall be 150 mm diameter x 9.5 mm thick wall at 1200 mm high, seamless steel pipe. Install 1200 mm into a concrete foundation. Fill bollard with 25 MPa concrete and round top. Round top of footing also. For number of Bollards required - refer to Drawings.

.2 Refer to drawing AD 209.

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3.9 SOCCER GOAL POSTS

.1 Refer to drawing AD 211 in Specification Binder C for information. Provide 1 moveable goalpost at each end of play field (2 in total).

.2 Goalposts can also be supplied by a gymnasium equipment supplier listed in Section 11 52 00. Moveable goalposts must meet the required size as described in AD 211.

3.10 STAGE RIGGING & SUPPORT ANGLES

.1 Refer to ADs for details.

3.11 GARBAGE BIN ENCLOSURE

.1 Refer to drawings AD 221 & AD 222 for details.

3.12 GYM STORAGE FENCE AND GATE

.1 Wire Storage System:

.1 Welded wire mesh partition and swing doors as manufactured by Spinnaker.

.2 Provide a complete assembly, complete with hinges and locking hasps; for Gym Storage compartment.

3.13 DUST COLLECTOR GATE

.1 Provide a complete assembly as shown on drawings, complete with acoustic louvre (refer to specification Section 08 92 00 Louvres) hinges and locking hasps.

3.14 GALVANIZED STEEL

.1 Galvanize steel members, fabrications, and assemblies after fabrication by the hot dip process in accordance with CSA G164, minimum Z275 coating.

.2 Galvanize bolts, nuts and washers and iron and steel hardware components in accordance with CSA G164.

.3 Safeguard products against steel embrittlement in conformance with ASTM A143.

.4 Design features which may lead to difficulties during galvanizing shall be pointed out prior to dipping.

.5 The composition of metal in the galvanizing bath shall be not less than 98.0% zinc.

3.15 ERECTION

.1 Erect work in accordance with shop drawings and in coordination with trades whose work relates to this Section

.2 Erect work plumb, straight, square and accurately fitted with tight joints at intersections.

.3 Where possible install work in one continuous piece.

□

.4 Anchor all components to structure, walls, and floors as required with weld or other methods of anchorage approved by the Consultant.

3.16 TOUCH-UP AND REPLACEMENT

.1 Touch-up adjacent primed surfaces burned, scratched or otherwise damaged during erection with prime paint, to match shopcoat, or galvafroid for galvanized when erection is completed.

.2 Paint over bare areas on galvanized surfaces and welds with zinc rich paint.

.3 Replace damaged or unacceptable materials indicated by the Consultants.

3.17 CLEANING

.1 Perform cleaning after installation to remove construction and accumulated environmental dirt.

.2 Upon completion of installation, remove surplus materials, rubbish, tools and equipment barriers.

END OF SECTION

□

Part 1 General

1.1 RELATED SECTIONS

.1 Section 03 10 00 – Concrete Forms and Accessories.

.2 Section 08 11 14- Steel Doors and Frames.

.3 Section 07 50 13 – Common Work Results for Roofing

.4 Section 07 50 16 – Rough Carpentry for Roofing.

1.2 REFERENCES

.1 Canadian Standards Association (CSA International)

- .1 CSA B111-[1974(R1998)], Wire Nails, Spikes and Staples.
- .2 CAN/CSA-G164-[M92(R1998)], Hot Dip Galvanizing of Irregularly Shaped Articles.
- .3 CSA O121-[M1978(R1998)], Douglas Fir Plywood.
- .4 CAN/CSA-O141-[91(R1999)], Softwood Lumber.
- .5 CSA O151-[M1978(R1998)], Canadian Softwood Plywood.
- .6 CAN/CSA-O325.0-[92(R1998)], Construction Sheathing.
- .7 CAN/CSA-086M-01(R2006), Engineering Design in Wood.

.2 National Lumber Grades Authority (NLGA)

- .1 Standard Grading Rules for Canadian Lumber [2000].

1.3 QUALITY ASSURANCE

.1 Lumber identification: by grade stamp of an agency certified by Canadian Lumber Standards Accreditation Board.

.2 Plywood identification: by grade mark in accordance with applicable CSA standards.

.3 Plywood, OSB and wood based composite panel construction sheathing identification: by grademark in accordance with applicable CSA standards.

1.4 WASTE MANAGEMENT AND DISPOSAL

.1 Remove from site and dispose of packaging materials at appropriate recycling facilities.

.2 Divert unused wood materials from landfill to recycling, reuse, composting facility approved by Consultant.

.3 Do not dispose of preservative treated wood through incineration.

.4 Do not dispose of preservative treated wood with materials destined for recycling or reuse.

.5 Dispose of treated wood, end pieces, wood scraps and sawdust at sanitary landfill approved by Consultant.

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.6 Dispose of unused wood preservative material at official hazardous material collections site approved by Consultant.

.7 Do not dispose of unused preservative material into sewer system, into streams, lakes, onto ground or in other locations where they will pose health or environmental hazard.

Part 2 Products

2.1 LUMBER MATERIAL

.1 Lumber: unless specified otherwise, softwood, S4S, moisture content 19% or less in accordance with following standards:

.1 CAN/CSA-O141.

.2 NLGA Standard Grading Rules for Canadian Lumber.

.2 Furring, blocking, nailing strips, grounds, rough bucks, cants, curbs, fascia backing and sleepers:

.1 Douglas fir Graded 122-C, construction or No. 2 Pine, pressure treated in accordance with CSA 080M.

.2 Board sizes: "Standard" or better grade.

.3 Dimension sizes: "Standard" light framing or better grade.

.4 Post and timbers sizes: "Standard" or better grade.

.5 Fasteners: Proprietary fasteners toggle bolts, expansion shields and lag bolts, crews and lead or inorganic fire plugs, explosive actuated fastening devices, recommended for purpose by manufacture. Use stainless steel or galvanized to CSA G164-M1981 fasteners for all exterior fastening and for any damp or moist areas.

.6 Wood Preservatives: Surface-applied wood preservative: clear copper napthenate or 5% pentachlorophenol solution, water repellent preservative.

.7 Material shall be straight, sawn square, true, dressed four sides properly sized, shaped to correct dimensions from nominal sizes noted on Drawings.

2.2 PANEL MATERIALS

.1 Douglas fir plywood (DFP): to CSA O121, standard construction, good one side with waterproof adhesive.

2.3 ACCESSORIES

.1 Nails, spikes, staples, screws, bolts anchors lag screws, special fastening devices and supports required for erection of all carpentry components: to CSA B111. Use galvanized components where exposed to exterior atmosphere.

2.4 FINISHES

.1 Galvanizing: to CAN/CSA-G164, use galvanized fasteners for exterior work and interior highly humid areas.

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Part 3 Execution

3.1 GENERAL

.1 Supply and install all other carpentry shown on drawings or as required for completion of work. Co-operate with other trades in installing items supplied by other sections, cut openings in woodwork when so required and make good disturbed surfaces.

3.2 PREPARATION

.1 Do all wood framing in accordance with the Ontario Building Code and Can3 086M 01 (2006).

.2 Machine dressed work shall be slow fed using sharp cutters and finished members shall be free from drag, feathers, slivers or roughness of any kind.

.3 Frame materials with tight joints rigidly held in place.

.4 Design construction methods for expansion and contraction of the materials.

.5 Erect work plumb, level, square and to required lines.

.6 Be responsible for methods of construction for ensuring that materials are rigidly and securely attached and will not be loosened by the work of other trades.

3.3 FURRING AND BLOCKING

.1 Supply and install furring and blocking, required.

.2 Align and plumb faces of furring and blocking to tolerance of 1:600.

3.4 ROUGH BUCKS AND NAILERS

.1 Install wood bucks and nailers, as indicated, including wood bucks and linings around frames for doors and windows.

.2 Except where indicated, otherwise, use material at least 38 mm thick secured with 9 mm bolts located within 300 mm from ends of members and uniformly spaced at 1200 mm between.

.3 Countersink bolts where necessary to provide clearance for other work.

3.5 ROOF FASCIAS, CANTS, NAILERS CURBS

.1 Install wood cants, fascia backing, nailers, curbs and other wood supports for roofing, sheet metal fork, roof mounted equipment.

.2 Secure with galvanized 9 mm bolts, where indicated, galvanized nails elsewhere. Locate fastenings within 300 mm from ends and uniformly spaced between. Space bolts at 1200 mm and nails at 600 mm centres, except where indicated otherwise.

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.3 Staple vapour retardant sheet strip to underside of nailers before installation. Apply strip continuous with 200 mm overlap at joints, free of wrinkles and tears, with at least 200 mm exposed for overlap on roof deck.

.4 Install wood nailers for roof hoppers, dressed, tapered and recessed slightly below top surface of roof insulation.

3.6 SUPPORTS FOR MECHANICAL UNITS

.1 Performed by Section 07 50 16. Refer to Section 07 50 13 for work division.

3.7 PRESSURE TREATED WOOD

.1 Use wood pressure treated in accordance with CSA 080M for all wood members in contact with exterior walls and roofs.

.2 Re-treat surfaces exposed by cutting, trimming or boring with liberal brush application of preservative before installation.

3.8 GARBAGE ENCLOSURE DOORS

.1 Supply and install 38 mm x 140 mm pressure treated wood slats to front of garbage enclosure doors.

.2 Fasten each slat to steel frames with 2 screws at top, bottom and at diagonal bracing.

3.9 INSTALLATION OF HOLLOW METAL FRAMES

.1 Set frames plumb and square in their exact location and at correct elevation. Firmly block and brace to prevent shifting. Shim up where required to ensure proper alignment dimensions from finished floor to head of frame. Install temporary wood spreaders at mid-height.

.2 Where pressed steel frames are installed in concrete walls, secure frames to concrete using lead expansion shields and anchor bolts through pipe sleeves. Perform drilling of concrete as required. Fill recessed bolt heads flush to frame face with approved metal filler and sand smooth.

.3 Install fire rated door frames in accordance with requirements of National Fire Code Volume 4, produced by The National Fire Protection Association (NFPA 80).

3.10 GENERAL

.1 Supply and install all other carpentry shown on drawings or as required for completion of work. Co-operate with other trades in installing items supplied by other sections, cut openings in woodwork when so required and make good disturbed surfaces.

3.11 ERECTION

.1 Frame, anchor, fasten, tie and brace members to provide necessary strength and rigidity.

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.2 Countersink bolts where necessary to provide clearance for other work.

3.12 INSTALLATION

.1 Lay out work carefully and to accommodate work of others. Cut and fit accurately. Erect in position indicated by drawings. Align, level, square, plumb, and secure work permanently in place. Brace work temporarily as required. Join work only over solid bracing.

.2 Bore holes true to line and to same size as bolts. Drive bolts into place for snug fit, and use plates or washers for bolthead and nut bearings. Turn up bolts and lag screws tightly when installed, and again just before concealed by other work or at completion of work.

.3 Co-operate with work of other Sections to ensure that unity of actions will ensure orderly progress to meet construction schedule.

.4 Provide anchors, bolts and inserts, required for attachment of the work of this Section, to those performing the work of other Sections and who are responsible for their installation.

.5 Work shall include rough hardware such as nails, bolts, nuts, washers, screws, clips, hangers, connectors, and strap iron required for installation of work and all operating hardware required on work of this Section for temporary use.

.6 Do no attach work by wood plugs or blocking in concrete or masonry. Use lead shields, expansion shields, concrete nails, or similar methods only as approved by the Architect.

.7 Do not regard grounds, blocking, furring, and such other fastening provisions as shown on Drawings as exact or complete. Provide required provisions for fastening, located and secured to suit site conditions, and adequate for intended support.

.8 Cut fastening work into lengths as long as practicable and with square ends. Erect work plumb, in true planes, and fastened rigidly in place.

.9 Grounds around openings in cavity wall systems, under sills and thresholds to provide continuous support shall be 50mm (2”) minimum thickness, preservative treated.

.10 Install supports and furring members as required to receive components of cabinetwork.

.11 Install blocking at roofs, as indicated on Drawings, secured permanently to structure, trimmed and levelled to accommodate roofing components, and to receive flashings.

.12 All members shall be accurately cut to length, angle and be true to line to assure tight joints.

.13 Correct alignment and plumb must be maintained until specified lateral bracing is installed. Cutting and altering of trusses is not permitted except by approval by the Engineer. Heavy concentrated loads must not be placed on top of trusses until permanent bracing and decking have been installed. In any event, these temporary loads must not exceed the truss design loads.

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3.13 SCHEDULES

.1 Provide electrical equipment backboards for mounting electrical equipment as indicated. Use 19mm thick plywood on 19 x 38 mm furring around spacing, perimeter and at maximum 300 mm intermediate

END OF SECTION

□

Part 1 General

1.1 RELATED SECTIONS

.1 Section 01 33 00 - Submittal Procedures.

.2 Section 06 10 11 – Rough Carpentry.

.3 Section 06 47 00 – Plastic Laminates.

.4 Section 08 80 50 – Glazing.

1.2 REFERENCES

.1 American National Standards Institute (ANSI)

.1 ANSI A208.1-[99], Particleboard.

.2 ANSI A208.2-[94], Medium Density Fiberboard (MDF).

.2 American Society for Testing and Materials (ASTM)

.1 ASTM E1333-[96], Standard Test Method for Determining Formaldehyde Concentrations in Air and Emission Rates From Wood Products Using a Large Chamber.

.2 ASTM D2832-[92(R1999)], Standard Guide for Determining Volatile and Non-volatile Content of Paint and Related Coatings.

.3 ASTM D5116-[97], Standard Guide for Small-Scale Environmental Chamber Determinations of Organic Emissions from Indoor Materials/Products.

.3 Architectural Woodwork Manufacturers Association of Canada (AWMAC)

.1 AWMAC Quality Standards for Architectural Woodwork.

.4 Canadian General Standards Board (CGSB)

.1 CAN/CGSB-71.20-[M88], Adhesive, Contact, Brushable.

.5 Canadian Standards Association (CSA)

.1 CSA B111-[74(R1998)], Wire Nails, Spikes and Staples.

.2 CSA O112.4-[M1977(R1999)], Standards for Wood Adhesives.

.3 CSA O112.5-Series-M-[1977(R1999)], Urea Resin Adhesives for Wood (Room- and High-Temperature Curing).

.4 CSA O112.7-Series M-[1977(R1999)], Resorcinol and Phenol-Resorcinol Resin Adhesives for Wood (Room- and Intermediate-Temperature Curing).

.5 CSA O115-[M1982(R2001)], Hardwood and Decorative Plywood.

.6 CSA O121-[M89(R1998)], Douglas Fir Plywood.

.7 CAN/CSA O141-[91R1999], Softwood Lumber.

.8 CSA O151-[M1978(R1998)], Softwood Plywood.

.9 CSA O153-[M1980(R1998)], Poplar Plywood.

.10 CSA Z760-[94], Life Cycle Assessment.

.6 Environmental Choice Program (EPC)

.1 ECP-44-[92], Adhesives.

.2 ECP-45-[92], Sealants and Caulking Compounds.

.3 ECP-76-[98], Surface Coatings.

.7 International Organization for Standardization (ISO)

.1 ISO 14040-[97], Environmental Management-Life Cycle Assessment - Principles and Framework.

.2 ISO 14041-[98], Environmental Management-Life Cycle Assessment - Goal and Scope Definition and Inventory Analysis.

.8 National Electrical Manufacturers Association (NEMA)

.1 NEMA LD-3-[95].

.9 National Hardwood Lumber Association (NHLA)

.1 Rules for the Measurement and Inspection of Hardwood and Cypress [, January 1996].

.10 National Lumber Grades Authority (NLGA)

.1 Standard Grading Rules for Canadian Lumber [, 2000].

1.3 SHOP DRAWINGS

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

.2 Indicate details of construction, profiles, jointing, fastening and other related details.

.1 Scales: profiles full size, details 1/2 full size.

.3 Indicate materials, thicknesses, finishes and hardware.

1.4 SAMPLES

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

.2 Submit duplicate samples: sample size 300 x 300 mm samples of each type of paneling laminate, melamine and each type of solid wood or plywood to receive stain or natural finish.

.3 Submit a typical prototype unit representative of the work of this section.

1.5 QUALIFICATION

.1 Millwork manufacturer to have not less than 5 years proven first class experience in institutional millwork, shall be a member of AWMAC or shall be able to provide a maintenance bond as specified.

1.6 GUARANTEE

.1 This architectural woodworker shall furnish the owner with a two (2) year AWMAC Guarantee Certificate, or an equivalent maintenance bond, to the full value of the architectural woodwork sub-contract, certifying that the architectural woodwork has been manufactured and/or installed in accordance with the standards incorporated in the

AWMAC Quality Standards Manual, (edition in effect at time of tender). Those providing the maintenance bond, instead of the Guarantee Certificate, to submit a letter from their insurer stating that they will provide the bond. A copy of this letter to be attached to their tenders. The Guarantee shall cover replacing and/or refinishing to make good any defects in architectural woodwork due to faulty workmanship or defective materials supplied by this architectural woodworker, which appear during a two (2) year period following the date of substantial completion of the project.

1.7 INSPECTION

.1 Architectural woodwork shall be manufactured and/or installed to the specified AWMAC Quality Standards and shall be subject to an inspection at the plant and site by an appointed inspector, approved by the AWMAC Chapter. Such inspection costs shall be paid from Cash Allowances. Shop drawings shall be submitted for review or approval before any work is commenced. Any work which does not meet AWMAC Quality Standards, as specified, shall be replaced by this architectural woodworker, at no additional cost to the owner and to the satisfaction of the consultant and the inspector.

1.8 DELIVERY, STORAGE, AND HANDLING

.1 Protect millwork against dampness and damage during and after delivery.

.2 Store millwork in ventilated areas, protected from extreme changes of temperature or humidity.

Part 2 Products

2.1 MATERIALS

.1 Softwood lumber: unless specified otherwise, S4S, moisture content 10 % or less for interior work in accordance with following standards:

.1 CAN/CSA-O141.

.2 NLGA Standard Grading Rules for Canadian Lumber.

.3 AWMAC premium grade, moisture content as specified.

.2 Hardwood lumber: moisture content 10% or less for interior work in accordance with following standards:

.1 National Hardwood Lumber Association (NHLA).

.2 AWMAC premium grade, moisture content as specified.

.3 Species: to be Maple unless otherwise noted.

.3 Hardwood plywood: to CSA O115, of thickness indicated, rotary cut face veneer, birch plywood, veneer core, No. 1 grade. Select veneers to provide book match veneer strips to be 240 mm wide minimum.

.1 Species: to be Birch, unless otherwise noted.

.4 Nails and staples: to CSA B111, galvanized for exterior work, interior high-humidity areas and for treated lumber; plain finish elsewhere. Use spiral thread nails except where specified elsewhere.

.5 Particle Board core: to CAN3-0188.1-M78, Grade R, 720 kg/m3 density in thicknesses indicated.

.6 Plywood core for shelving: to CSA 0120.

2.2 PLASTIC LAMINATE

.1 Refer to Section 06 47 00.

2.3 MELAMINE FACED PARTICLEBOARD

.1 To CAN3-0.188.1-M78, Grade "R" particleboard sanded faces, 13 mm, 16 mm, and 19 mm thickness, faced with laminated plastic. Melamine resin impregnated cover sheet with coloured and/or pattern paper inner layer. Thermally fuse to rigid particleboard substrate. Melamine faces shall be 8 mil thickness. Wood grain pattern to be chosen by Consultant from manufacturer's full range.

.1 Acceptable Material: Melamine faced particleboard as manufactured by Flakeboard, Formica or Arborite Division of Domtar Construction Materials Ltd., are of acceptable quality but colour/pattern requires approval prior to confirmation of full acceptance.

2.4 EDGE BANDING

.1 Solid polyvinyl chloride (PVC), 3 mm thickness x full width of panel edge, colour/pattern to match finished face of melamine panel or as selected by Consultant. All exposed edges of banding to be radiused to 2 mm radius after installation on panels. Submit sample of edge-banded panel with radiused edges to Consultant for approval prior to fabrication of architectural woodwork.

.1 Acceptable Material: Solid PVC edging as manufactured by "Woodtape" Edge-Banding.

.2 Acceptable Material: Solid PVC edging as manufactured by "Complast Inc."

.3 Provide solid hardwood edging, and plastic laminate edging where specified on AD drawings.

2.5 CABINET HARDWARE

.1 Furnish and install all hardware to custom casework as follows:

.1	Cupboard Doors - 19 mm thick.:		
	.1	Hinges	200 Series 110° Salice
	.2	Roller Catches	807N 2G (SgDr) Onward
	.3	Elbow Catches	T03222 C15 (DhDr)
	.4	Door Pulls	CBH235-3 1/2" C32D
	.5	Cupboard Locks	8703/8704 14a National
.2	Drawers - 19 mm thick.:		
	.1	Drawer Slides	"Accuride Slide" 3832-2G full extension with ball bearing rollers, 100lb. capacity
	.2	Drawer Pulls	CBH235-3 1/2" C32D
	.3	Drawer Locks	8703 - 14a National
.3	Shelving:		
	.1	Plaster strips	KV255 Zinc Knape & Vogt

.2 Shelf Clips KV256 Zinc Knape & Vogt

.4 Teacher's Closet Doors - 35 mm thick.:

.1 Hinges F179 76x76 Stanley C15

.2 Roller Catches 504N Onward C26

.3 Surface bolt 043-4 X Angle Strike C15

.4 Teacher's Closet Locks supplied and installed under Section 08 71 10 & 08 71 15.

.5 Closet Rods and Flanges

.1 Rods: chrome finish, Ø 33 mm.

.2 Flanges: chrome finish, closed flanges at both ends of rods.

.6 Shelf and Rod Steel, white enamel, model No. 1797, manufactured by Hager.

.7 Display Case:

.1 Pilaster Strips: Brush Finish

.2 Shelf Brackets: Brush Finish

.3 Aluminum sliding track, top and bottom to accommodate sliding glass doors

.4 Lock sets and all required hardware for sliding glass door display system

.5 Glazing: 12mm tempered glass for shelves. 8mm tempered glass for sliding doors. Glazing to display cases to be provided by Section 08 80 50 and installed by the Section 06 40 00.

.8 Counter Brackets:

.1 Teacher's Workroom Counter & Computer Room Counter (750mm counter depth) Support Bracket
Model: Hafele Hebgo Bracket, model no. 287-44-489, 150 kg capacity per pair, grey powder coat, refer to AD 600 series.

.2 Library Workroom Counter (635mm counter depth) Support Bracket
Model: Hafele Hebgo Bracket, model no. 287-45-477, 150 kg capacity per pair, grey powder coat, refer to AD 600 series.

.3 Copier Workroom #110 Counter (400mm counter depth) Support Bracket
Model: Hafele Hebgo Bracket, model no. 287-44-443, 150 kg capacity per pair, grey powder coat, refer to AD 600 series.

.9 Library Book Cart: springs for bottom panel support: 4 springs – "Producto" AM19908C ½" bar

.10 Safety Release Coat Hook:

.1 High strength polycarbonate coat hook with safety release weight under downward pressure to not exceed 12 kg (26 lbs.)

.2 Supply all suitable mounting hardware for a vandal proof, secure installation using stainless steel sleeve bolts on partition doors or panels. Do not supply standard Robertson or Phillips head screws.

.3 Colours: 2 premium colours from manufacturer's complete range.

.4 Acceptable Materials: "Henkel Hook" as manufactured/distributed by Henkel Diversified Inc, London ON, Tel. (519) 641-5872.

.5 Locations: to all Childcare and Kindergarten 'Cubbies'; two per unit as shown on AD 644. Hooks for these areas noted above are to be supplied

by this section. All other areas, safety hooks are to be supplied by Section 10 11 25.

.6 Samples: submit test data and samples for review as specified in Section 013330 – Submittal Procedures.

.11 Bench Support Brackets:

.1 Bench support brackets to be Hafele Hebgo bracket. Model to be coordinated by millwork contractor based on size and load capacity of 150 kg per 600mm.

.2 This section shall also include accessories such as rubber door silencers (2 per drawer or door), and other items necessary for the completion of the millwork.

.3 Cabinet Keying: Key all cabinet and drawer locks alike for the entire school, except teachers" closets.

2.6 MELAMINE CLAD CABINETWORK

.1 All cabinet frames whether for base, wall or tall floor standing cases, shall be fabricated so each is a self-contained module. Front side top and bottom, exterior and interior surfaces shall be finished allowing future relocation of any module, into any bench arrangement, without need of any additional finishing.

.2 Gables and panels shall be fabricated from 19 mm thick melamine surfaced panels with a P.V.C. edging applied to exposed edges.

.3 Bottoms shall be fabricated utilizing the same materials and edge finish as gables. Front edge will be edged with P.V.C. edging. All other edges will be thoroughly sealed and moisture proofed prior to attachment to gables.

.4 Rails shall be fabricated and machined to join the gables and form a rigid cabinet frame.

.5 Tops (applies to wall and tall units only) shall be fabricated utilizing the same material and edge finish as gables. Front edge will be edged with P.V.C. edging.

.6 Toe kick rail shall have a 100 mm x 19 mm section, machined to receive four screw nails for attachment to bottom front edge of gables. Cabinet base shall be plywood attached to melamine cabinet separately, insuring the melamine particle core gables do not come in contact with the floor.

.7 Backs in base cupboards shall be fabricated from a 6 mm hardboard.

.8 Backs in wall and tall cabinets shall be fabricated from 13 mm thick melamine surfaced panels securely glued and screw nailed into the check out provided in the backs of gables, tops, and bottoms.

.9 Shelves shall be fabricated from 19 mm birch plywood with solid birch edge and lacquer finish. All shelves shall be adjustable at 13 mm increments and each will be supported by a shelf support resting in four pilaster strips attached to the gables.

.10 Doors shall be fabricated from 19 mm thick melamine surfaced panels. All four edges shall be P.V.C. edging.

.11 Drawer fronts shall be fabricated utilizing the same material and edge finish as doors. All four edges shall P.V.C. edging. Fronts will be secured to drawer bodies with five screw nails through the front of the drawer body into the core of the drawer front.

.12 Drawer bodies shall consist of box construction fabricated from 13 mm birch plywood with solid birch edge, front, sides and back with a 6 mm hardboard bottom dadoed and glued into box members. Joint front, sides and back with carefully fitted glued and tenoned joints. Alternately, Blum Metabox drawer body and side can be used.

.13 35 mm thick doors shall be solid core with plastic laminate both sides and on all four edges, color and grain to match melamine.

.14 Solid hardwood glazed door fronts and frames shall receive lacquer finish. Glazing shall be 3mm tempered clear glass.

.15 Finish:

.1 Melamine surfaced panels shall be finished both sides in the same colours, patterns, and grain as selected by the Consultant.

.2 Solid hardwood glazed doors and drawer bodies shall be sanded, then sealer coated, and sanded with two finish coats of catalytic type acid resistant varnish.

2.7 PLASTIC LAMINATE on PLYWOOD cabinetwork

Refer to AD drawings (binder C) for locations

.1 Plastic Laminate factory glued to plywood core, thickness as shown or specified.

.2 Plastic laminate graphics to be book matched or run in same direction where applicable. All exposed finished casework, drawer, cupboard and door fronts shall have vertical grain orientation.

.3 Use solid hardwood for exposed edges, typical for Library/Learning Commons millwork.

.4 Case bodies: ¾" plywood, finish with plastic laminate factory adhered. Typical for gables and panels

.6 Backs: ¼" plywood, finished with plastic laminate. Backs in wall and tall cabinets shall be securely glued and screw nailed into the check out provided in the backs of gables, tops, and bottoms.

.7 Shelving: ¾" plywood, finish with plastic laminate factory adhered. All shelves shall be adjustable at 13mm increments and each will be supported by a shelf support resting in four pilaster strips attached to the gables.

.8 Drawers:

.1 ¾" plywood, finish with plastic laminate. All four edges shall have plastic laminate edging. Fronts will be secured to drawer bodies with five screw nails through the front of the drawer body into the core of the drawer front.

.2 Drawer box including front, back and sides shall consist of box construction, carefully fitted glued and tenoned joints.

.3 Drawer bottom to be ¼" plywood, plastic laminate finished, dadoed and glued into box members.

.9 Casework doors: ¾" plywood, plastic laminate finished with plastic laminate to all four sides. Locks to be provided as indicated on details.

.10 All cabinet frames whether for base, wall or tall floor standing cases, shall be fabricated so each is a self-contained module. Front side top and bottom, exterior and interior surfaces shall be finished allowing future relocation of any module, into any bench arrangement, without need of any additional finishing.

.11 Rails shall be fabricated and machined to join the gables and form a rigid cabinet frame.

.12 Tops (applied to wall and tall units only) shall be fabricated utilizing the same material and edge finish as gables.

.13 Toe kick rail (behind rubber or ceramic base, as applicable) shall have a 4" x 3/4" section, waterproof fir plywood, machined to receive four screw nails for attachment to bottom front edge of gables. Cabinet base shall be plywood attached to cabinet separately, insuring the plastic laminate plywood gables do not come in contact with the floor.

2.8 SHOP FABRICATION

.1 Shop install cabinet hardware.

.2 Provide cutouts for plumbing fixtures, inserts, appliances, outlet boxes and other fixtures.

.3 Shop assemble work for delivery to site in size easily handled and to insure passage through building openings.

2.9 BENCHES

.1 32 x 92 solid maple boards with 32 x 108 solid maple edges. Lengths, as indicated on Plans, secured to metal supports. Polyurethane finish, semigloss.

.2 Bench support brackets to be Hafele Hebgo bracket. Model to be coordinated by millwork contractor based on size and load capacity of 150 kg per 600mm.

2.10 SLATWALL

.1 Maple or birch veneered slatwall panels, with metal inserts

.2 Standard slatwall panel sizes 1219 mm x 2438 mm (4'x8') x 19mm (3/4") thick.

.3 Grooves 150mm (6") OC (industry standard) to accept standard industry slatwall accessories.

.4 To be used in Library millwork unit (refer to Binder C – ADs) and applied to Library Workroom walls (Library side) per interior elevations.

2.11 PLASTIC LAMINATED TOPS

.1 Coordinate with Section 06 47 00.

.2 19 mm thick particle board core with post-forming grade plastic laminate finish bonded with resorginal formaldehyde resin glue to a particleboard core. All countertop front face to return vertically 35 mm ± . All front and backsplash edges to be rounded.

.3 Underside to receive a backing sheet, sanded one side and bonded same as surfacing material.

.4 Exposed edges to be finished with same material as used for the top.

.5 Drip grooves to be cut into underside of the top where exposed edges occur.

.6 Splash backs, curbs and curb shelves are to be of similar construction as the tops.

.7 Use acid resistant post-forming grade laminate, where indicated on drawings. Colour: black.

.8 At all wall termination, provide backsplash return.

2.12 MOULDING AND TRIMS

.1 Fabricate mouldings in maximum practical lengths to profile shown. Install with concealed fasteners.

.2 Note requirement for this Section to supply and install solid maple or birch wood trim with clear satin trim to **Acoustic panels in Gymnasium** and **Applications Classroom 206**. Refer to Drawings and interior elevations for locations and details.

2.13 FABRICATION

.1 Set nails and countersink screws apply wood filler to indentations, sand smooth and leave ready to receive finish.

.2 Shop install cabinet hardware for doors, shelves and drawers. Recess shelf standards unless noted otherwise.

.3 Shelving to cabinetwork to be adjustable unless otherwise noted.

.4 Provide cut-outs for plumbing fixtures, inserts, appliances, outlet boxes and other fixtures.

.5 Shop assemble work for delivery to site in size easily handled and to ensure passage through building openings.

.6 Obtain governing dimensions before fabricating items which are to accommodate or abut appliances, equipment and other materials.

.7 Ensure adjacent parts of continuous laminate work match in colour and pattern.

.8 Form shaped profiles and bends as indicated, using postforming grade laminate to laminate manufacturer's instructions.

.9 Use straight self-edging laminate strip for flatwork to cover exposed edge of core material. Chamfer exposed edges uniformly at approximately 20 degrees. Do not mitre laminate edges.

.10 Apply laminate backing sheet to reverse side of core of plastic laminate work.

.11 Apply laminated plastic liner sheet where indicated.

2.14 SCIENCE CLASS UPPER CABINETS

.1 6 mm tempered Glazing to upper cabinet units in science classroom to be provided to Millworker by Section 08 80 50.

2.15 DISPLAY CASES

.1 Display Cases: Provide and install appropriate hinges, keyed locks and wood/glass shelf supports required for all display cases as described on drawings. Glazing to be provided by section 08 80 50. Refer to Section 08 80 50.

.2 Display/Trophy Case Finish:

.1 Linseed oil, Forbo Tackboard surfacing to interior of all display cabinets where felt or tackboard is indicated: supplied by Architectural School Products or equivalent product by other manufacturer approved by the Consultant. Colour to be selected by Architect.

2.16 INSTALLATION

.1 Do architectural woodwork to Quality Standards of the Architectural Woodwork Manufacturers Association of Canada (AWMAC), except where specified otherwise.

.2 Install prefinished millwork at locations shown on drawings. Position accurately, level, plumb straight.

.3 Set and secure all material and components in place, rigid, plumb and square.

.4 Provide heavy duty fixture attachments for wall mounted cabinets.

.5 Use draw bolts in countertop joints.

.6 At junction of plastic laminate counter back splash and adjacent wall finish, apply small bead of sealant.

.7 Apply water resistant building paper over wood framing members in contract with masonry or cementitious construction.

.8 After installation, fit and adjust operating hardware for wood and laminated plastic cabinet doors, drawers and shelves.

2.17 CLEANING

.1 Clean millwork, cabinet work, drawers and outside surfaces.

.2 Remove excess glue from surfaces.

2.18 PROTECTION

.1 Protect millwork and cabinet work from damage until final inspection.

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

.1 Materials and installation for asphalt for use as waterproofing.

1.2 RELATED SECTIONS

.1 Section 01 33 00 - Submittal Procedures.

.2 Section 01 51 00 - Temporary Utilities.

.3 Section 312310- Excavating, Trenching and Backfilling

.4 Section 033000- Cast- in-Place Concrete

.5 Section 042113- Masonry

1.3 REFERENCES

.1 Canadian General Standards Board (CGSB)

.1 CAN/CGSB-37.2-[M88], Emulsified Asphalt, Mineral-Colloid Type, Unfilled, for Dampproofing and Waterproofing and for Roof Coatings.

.2 CAN/CGSB 37.3-[M89], Application of Emulsified Asphalts for Dampproofing or Waterproofing.

.3 CAN/CGSB 37.5-[M89], Cutback Asphalt Plastic Cement.

.4 CGSB 37-GP-6Ma-[83], Asphalt, Cutback, Unfilled, for Dampproofing.

.5 CGSB 37-GP-9Ma-[83], Primer, Asphalt, Unfilled, for Asphalt Roofing, Dampproofing and Waterproofing.

.6 CGSB 37-GP-11M-[76(R1984)], Application of Cutback Asphalt Plastic Cement.

.7 CGSB 37-GP-12Ma-[84], Application of Unfilled Cutback Asphalt for Dampproofing.

.8 CGSB 37-GP-15M-[76(R1984)], Application of Asphalt Primer for Asphalt Roofing, Dampproofing and Waterproofing.

.9 CAN/CGSB 37.16-[M89], Filled, Cutback, Asphalt for Dampproofing and Waterproofing.

.10 CAN/CGSB 37.28-[M89], Reinforced Mineral Colloid Type, Emulsified Asphalt for Roof Coatings and for Waterproofing.

.11 CGSB 37-GP-36M-[76], Application of Filled Cutback Asphalts for Dampproofing and Waterproofing.

.12 CGSB 37-GP-37M-[77], Application of Hot Asphalt for Dampproofing or Waterproofing.

.2 Canadian Standards Association (CSA International)

.1 CSA A123.4-[98], Bitumen for Use in Construction of Built-Up Roof Coverings and Dampproofing and Waterproofing Systems.

.3 Health Canada

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.1 Workplace Hazardous Materials Information System (WHMIS)

.1 Material Safety Data Sheets (MSDS).

.4 National Research Council Canada (NRC)/Institute for Research in Construction (IRC)

.1 Canadian Construction Materials Centre (CCMC)

1.4 PRODUCT DATA

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

.2 Submit product data sheets for bituminous dampproofing products. Including:

.1 Product characteristics.

.2 Performance criteria.

.3 Application methods.

.4 Limitations.

.3 Manufacturer's Instructions: Provide to indicate special handling criteria, installation sequence, and cleaning procedures.

1.5 DELIVERY, STORAGE AND HANDLING

.1 Provide and maintain dry, off-ground weatherproof storage.

.2 Store materials on supports to prevent deformation.

.3 Remove only in quantities required for same day use.

.4 Store materials in accordance with manufacturer's written instructions.

.5 Store solvent base liquids away from excessive heat and open flame.

.6 Store emulsion liquids at above freezing temperatures, free from contact with cold or frozen surfaces.

1.6 WASTE MANAGEMENT AND DISPOSAL

.1 Remove from site and dispose of packaging materials at appropriate recycling facilities.

.2 Ensure emptied containers are sealed and stored safely.

.3 Fold up metal banding, flatten and place in designated area for recycling.

.4 Divert unused bituminous waterproofing, sealing compounds and asphalt primer materials from landfill to recycling facility approved by Consultant.

1.7 PROJECT/SITE ENVIRONMENTAL REQUIREMENTS

.1 Temperature, relative humidity, moisture content.

.1 Apply waterproofing materials only when surfaces and ambient temperatures are within manufacturers' prescribed limits.

.2 Do not proceed with Work when wind chill effect would tend to set bitumen before proper curing takes place.

.3 Maintain air temperature and substrate temperature at dampproofing installation area above 5 degrees C for 24 hours before, during and 24 hours after installation.

.4 Do not apply dampproofing in wet weather.

.2 Safety: Comply with requirements of Workplace Hazardous Materials Information System (WHMIS) regarding use, handling, storage, and disposal of asphalt, sealing compounds, primers and caulking materials.

.3 Ventilation:

.1 Ventilate area of Work as directed by Consultant by use of approved portable supply and exhaust fans.

.2 Ventilate enclosed spaces in accordance with Section 01 51 00 - Temporary Utilities.

.3 Provide continuous ventilation during and after waterproofing application. Run ventilation system 24 hours per day during installation; provide continuous ventilation for 7 days after completion of waterproofing installation.

1.8 QUALIFICATIONS AND QUALITY ASSURANCE

.1 Waterproofing shall be carried out by applicators skilled and with previous similar experience in this work in strict accordance with manufacturer's printed instructions. Submit proof of experience upon Consultant’s request.

.2 Manufacturer’s representative shall be called by the applicator to inspect the substrate prior to commencement of work.

.3 Manufacturer’s representative shall be retained by installer to provide technical assistance on a as-needed basis during course of installation of membrane.

1.9 EXTENDED WARRANTY

.1 Contractor performing the work of this Section, shall provide a full materials and labour warranty for 5 years from the date of Substantial Performance of the Contract.

.2 Contractor hereby warrants that the waterproofing membrane will stay in place and remain leakproof in accordance with the Contract, but for 5 years.

.3 Waterproofing membrane manufacturer shall provide a written warranty that the waterproofing membrane will remain in a watertight condition and will not leak as a result of faulty materials for a period of ten years.

Part 2 Products

2.1 MATERIALS

.1 Locations: Walls below grade adjacent to sodded and planted areas. Refer to Drawings for typical wall sections.

.2 Primary Waterproofing Membrane for Vertical Foundation Walls: Cold applied elastomeric asphalt emulsion waterproofing membrane in compliance with CGSB 37.2

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shall be Aqua-Bloc 720-38 Elastomeric Asphalt Emulsion Waterproofing Membrane as manufactured by Bakor, a one component waterproofing compound compatible with sheet waterproofing membranes and substrates, having the following characteristics:

.1 Elongation: 2000%,

.2 Maximum VOC: 10 g/l

.3 Water vapour permeance: 10 ng/Pa.m².s, ASTM E96,

.4 Chemical resistance: Alkalis, calcium chloride, mild acid and salt solutions.

.5 Approved alternate Mel-Rol LM by W.R. Meadows of Canada.

.3 Fabric Reinforcement for Cold Applied Waterproofing: Fabric reinforcement shall be 990-06 Yellow Jacket as supplied by Bakor, a glass reinforcement sheet capable of allowing the membrane to bleed through adequately to provide a monolithic reinforced membrane system.

.4 Prefabricated Drainage Board for Vertical Surfaces: Bakor DB 2000 Prefabricated Composite Drain Board, a polypropylene core board with polypropylene fabric attached, having the following physical properties:

.1 Flow Rate: 223 L/min/m,

.2 Compressive Strength: 11,000 psf,

.3 Thickness: 10 mm

.5 Prefabricated Drainage Board Accessories

.1 Securement Bars: Continuous 6mm x 20mm (1/4" x 3/4") HDPE bar for screw attachment.

.2 Moulding Strip: Continuous 90mm wide "Z" flashing strip to fit over exposed top edge of drain board.

.3 Drain Board Plugs & Nails: HDPE pre-moulded washer to fit dimples c/w high strength, corrosion resistant concrete nails, UCAN AFH 37 or equal.

.4 Termination Sealant: Polybitume 570-05 Polymer Modified Sealing Compound as manufactured by Bakor, a polymer modified sealing compound, compatible with sheet waterproofing membrane, substrate and insulation materials, complies with CGSB 37.29, remains flexible with ageing and chemically resistant to alkalis, calcium chloride, mild acid and salt solutions.

Part 3 Execution

3.1 WORKMANSHIP

.1 Keep hot asphalt:

.1 Below its flash point.

.2 At or below its final blowing temperature.

.3 Within its equiviscous temperature range at place of application.

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3.2 PREPARATION

.1 Before applying waterproofing:

.1 Seal exterior joints between foundation walls and footings, joints between concrete floor slab and foundation and around penetrations through waterproofing with sealing compound.

.2 Before commencing work, ensure environmental and site conditions are suitable for installation of waterproofing membrane.

.3 The substrate shall be clean and dry, free from surface water, ice, snow or frost, dust, dirt, oil, grease, curing compounds or any other foreign matter detrimental to the adhesion of the waterproofing membrane.

.4 Can be applied to damp or new green concrete. Ensure concrete is smooth and free from voids and honeycombing prior to application of waterproofing membrane.

.5 Voids, cracks, holes and other damages to horizontal or vertical surfaces shall be repaired before application of the membrane.

.6 Notify Consultant and Contractor in writing of unsuitable surfaces and working conditions. Commencement of work shall imply acceptance of surfaces and working conditions.

3.3 MOCK UP

.1 Construct a 3 m x 2 m mock-up area for each separate job condition for inspection by the Consultant prior to proceeding with the work. Mock-up may be part of finished work.

.2 Notify Consultant and allow 24 hours for inspection by Consultant.

3.4 DECK TO VERTICAL JUNCTURES, FOOTINGS/FOUNDATION WALLS, CRACKS IN SLABS AND PROTRUSIONS

.1 Coat penetrations, such as brackets, clips, braces, etc. that are set into the concrete with a 2.3 mm (90 mil) coating of primary waterproofing membrane to the height of the wearing course and around projections to ensure a complete seal prior to coating the entire area.

.2 Penetrations subject to movement should be flashed with fabric reinforcement set into a minimum thickness of 2.3 mm (90 mil) of primary waterproofing membrane to required height on the wall and at least 100 mm (4”) on the slab, embed fabric reinforcement into wet coating followed by second coat.

.3 To all cracks and cold joints less than 3 mm (1/8”) apply a coat of primary waterproofing membrane at a minimum thickness of 2.3 mm (90 mil) and reinforce with fabric reinforcement.

.4 To all cracks greater than 3 mm (1/8”), prime area and install self-adhered flashing membrane. Overlap end joint of sheet a minimum 75 mm (3”).

.5 At monolithic wall/slab junctures, apply primary waterproofing membrane at a minimum thickness of 2.3 mm (90 mil) to required height on the wall and at least 100 mm (4”) on the slab and embed fabric reinforcement into wet primary waterproofing membrane followed by a second coat.

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.6 At non-monolithic wall/slab junctures, prime area, trowel-in fillet bead to inside corners and install self-adhered flashing membrane sheet to the required height on the wall and at least 100 mm (4") on the slab. Lap primary waterproofing membrane over a minimum of 50 mm (2").

.7 At footing to foundation wall junctions apply a coat of primary waterproofing membrane at a minimum thickness of 2.3 mm (90 mil) and reinforce with fabric reinforcement followed by second coat.

3.5 WATERPROOFING MEMBRANE VERTICAL APPLICATION

.1 Apply a full and continuous coat of primary waterproofing membrane at approximately 1.5 l/m^2 (3.6 gal. US/100ft^2) and embed fabric reinforcement into coating ensuring no fishmouths or wrinkles are created and allow to set.

.2 Apply second full and continuous coat of primary waterproofing membrane at 1.5 l/m^2 (3.6 gal./100$ft.^2$) and allow to cure.

3.6 WATERPROOFING MEMBRANE HORIZONTAL APPLICATION

.1 Apply a full and continuous coat of primary waterproofing membrane at approximately 1.5 l/m^2 (3.6 gal. US/100ft^2) and embed fabric reinforcement into coating ensuring no fishmouths or wrinkles are created and allow to set.

.2 Apply second full and continuous coat of primary waterproofing membrane at 1.5 l/m^2 (3.6 gal./100$ft.^2$) and allow to cure.

3.7 INSTALLATION OF PROTECTION BOARDS

.1 Protection Boards shall be installed over the waterproofing membrane to prevent damage from materials used in backfilling.

.2 Allow waterproofing to cure dry and apply protection board adhesive in 12mm wide strips spaced at 450 mm o/c to cure waterproofing membrane. Immediately embed protection board and press into adhesive to ensure full contact.

.3 Do not backfill until adhesive has cure dried. Do not use excessive levels of adhesive.

3.8 APPLICATION OF DRAINAGE BOARD VERTICAL

.1 Align and hang drainage up to foundation wall. Position bottom edge of drainage board to be in moderate contact with weeping tile system.

.2 Secure drainage board to foundation wall with nails and washers spaced 450 mm o/c horizontally. Install minimum of 2 rows staggered and spaced 150 mm apart and min 150 from top edge.

.3 Align and install termination strip along top edge with nails spaced 300 mm o/c and seal with termination sealant.

.4 Align and install moulding strip over completed top edge detail.

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.5 Overlap end laps, pull back loose fabric to expose drain core and position core of second panel over the overlap flange of first panel.

.6 Bend drain board to create inside corners and cut board to create outside corners, provide 75 mm of extra fabric to wrap corner.

.7 Stagger or offset joints of drain board sheets.

.8 Place all subsequent sheets in an overlapping single fashion.

.9 Backfill bottom edge in conjunction with weeping tile system.

3.9 APPLICATION

.1 Do sealing work in accordance with CGSB 37-GP-11M except where specified otherwise.

.2 Do priming of surface in accordance with CGSB 37-GP-15M except where specified otherwise.

.3 Apply primer.

3.10 SCHEDULE

.1 Apply continuous, uniform coating to entire exterior faces of foundation walls from 50 mm below finished grade level to and including tops of foundation wall footings.

.2 Apply continuous, uniform coating to exterior side of foundation walls enclosing rooms below finished grade. Include exterior portion of interior walls where floors in adjacent rooms are at different elevations.

.3 Apply two additional coats of dampproofing to vertical corners and construction joints for a minimum width of 230 mm on each side, and all around and for 230 mm along pipes passing through walls.

3.11 CLEANING

.1 Promptly as the work proceeds and on completion clean up and remove from site all rubbish and surplus materials resulting from the foregoing work.

END OF SECTION

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Part 1 General

1.1 RELATED SECTIONS

.1 Section 01 33 00 – Submittal Procedures.

.2 Section 04 21 13 – Masonry.

.3 Section 07 27 10 – Air Barriers.

.4 Section 07 55 00 – Roof insulation.

.5 Section 07 21 19 – Spray in Place Urethane Foam Insulation.

1.2 REFERENCES

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

.1 ASTM E96-[00e1], Test Methods for Water Vapour Transmission of Materials.

.2 Canadian General Standards Board (CGSB).

.1 CGSB 71-GP-24M-[77(R1983)], Adhesive, Flexible, for Bonding Cellular polystyrene Insulation.

.3 Underwriters Laboratories of Canada (ULC).

.1 CAN/ULC-S604-[91], Type A Chimneys.

.2 CAN/ULC-S701-[01], Thermal Insulation, Polystrene, Boards and Pipe Coverings.

.4 Environmental Choice Program (EPC).

.1 CCD-016-[97], Thermal Insulation.

1.3 SUBMITTALS

.1 Product Data:

.1 Submit manufacturer's printed product literature, specifications and data sheet in accordance with Section 01 33 00 - Submittal Procedures.

.2 Submit two copies of WHMIS MSDS - Material Safety Data Sheets in accordance with Section 01 33 00 - Submittal Procedures. Indicate VOC's insulation products and adhesives.

.2 Manufacturer's Instructions:

.1 Submit manufacturer's installation instructions.

1.4 QUALITY ASSURANCE

.1 Test Reports: certified test reports showing compliance with specified performance characteristics and physical properties.

.2 Certificates: product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.

.3 Pre-Installation Meetings: conduct pre-installation meeting to verify project requirements, manufacturer's installation instructions and manufacturer's warranty requirements.

1.5 WASTE MANAGEMENT AND DISPOSAL

.1 Remove from site and dispose of packaging materials at appropriate recycling facilities.

.2 Collect and separate for disposal paper, plastic, polystyrene, corrugated cardboard, packaging material [n appropriate on-site bins for recycling.

Part 2 Products

2.1 INSULATION

.1 Extruded polystyrene (XPS): to CAN/ULC-S701.

.1 R20.

.2 Thickness: **100 mm** or as indicated on drawings.

.3 Edges: ship-lapped.

.4 For use at typical cavity wall construction and at miscellaneous detail locations calling for rigid insulation.

.5 Acceptable Material: "**Styrofoam Cavity-Mate**" as manufactured by Dow Chemical Canada Inc.

.6 Acceptable Material: "**Foamular C200**" as manufactured by Celfortec Inc. (Owen Corning).

.7 or approved equal.

.2 Batt insulation: CAN/ULC-S702, Type 1.

.1 Friction fit batt insulation.

.2 For use in steel studs as indicated.

.3 Acceptable Material: 'Mineral Wool' by Roxul

.4 Or approved equal.

2.2 ADHESIVE

.1 Adhesive (for polystyrene): to CGSB 71-GP-24.

.1 Bakor Air Bloc 21.

.2 Compatible with respective rigid insulation, air/vapour and waterproofing membranes and recommended by manufacturers of those products. Use Bakor 230-21 rigid insulation adhesive for rigid insulation in contact with Blueskin air vapour barrier.

Part 3 Execution

3.1 MANUFACTURER'S INSTRUCTIONS

.1 Compliance: comply with manufacturer's written data, including product technical bulletins, product catalogue installation instructions, product carton installation instructions, and data sheets.

3.2 WORKMANSHIP

.1 Install insulation after building substrate materials are dry.

.2 Install insulation to maintain continuity of thermal protection to building elements and spaces.

.3 Fit insulation tight around electrical boxes, plumbing and heating pipes and ducts, around exterior doors and windows and other protrusions.

.4 Keep insulation minimum 75 mm from heat emitting devices such as recessed light fixtures, and minimum 50 mm from sidewalls of CAN4-S604 type A chimneys and CAN/CGA-B149.1 and CAN/CGA-B149.2

.5 Cut and trim insulation neatly to fit spaces. Butt joints tightly, offset vertical joints. Use only insulation boards free from chipped or broken edges. Use largest possible dimensions to reduce number of joints.

.6 Offset both vertical and horizontal joints in multiple layer applications.

.7 Do not enclose insulation until it has been inspected and approved by Consultant.

3.3 EXAMINATION

.1 Examine substrates and immediately inform Consultant in writing of defects.

.2 Prior to commencement of work ensure:

.1 Substrates are firm, straight, smooth, dry, free of snow, ice or frost, and clean of dust and debris.

3.4 RIGID PERIMETER FOUNDATION INSULATION INSTALLATION

.1 Apply adhesive to polystyrene in accordance with manufacturer's recommendations.

.2 Apply adhesive to insulation board by spot method with daubs 40 mm diameter x 25 mm high at 200 mm o.c. each way

.3 Interior application: extend boards vertically below bottom of finish floor slab as indicated on drawings, installed on inside face of perimeter foundation walls.

.4 Exterior application: extend boards below finish grade as indicated on drawings. Install on exterior face of perimeter foundation wall with adhesive.

.5 Under slab application: extend boards as indicated on drawings. Lay boards on level compacted fill.

3.5 RIGID CAVITY WALL INSULATION INSTALLATION

.1 System Comprised of:

.1 Specified thickness of rigid ship-lapped insulation on Henry-Bakor Blueskin SA air/vapour barrier.

.2 Henry-Bakor Airbloc 21 adhesive to be applied to all sides of insulation and continuous layer to all insulation surfaces in contact with air/vapour barrier. Butter all sides and back to ensure full air barrier integrity. Apply adhesive to polystyrene in accordance with manufacturer's recommendations

.3 Butter Air Bloc 21 at all brick tie penetrations to ensure a complete seal

.4 Install plastic LOC-Wedges at masonry veneer ties to ensure securement to structural wythe or back up wall and in full contact with air/vapour barrier on wall surfaces.

3.6 CLEANING

.1 Upon completion of installation, remove surplus materials, rubbish, tools and equipment barriers.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

.1 Section 04 21 13 - Masonry.

.2 Section 01 45 00 - Quality Control.

.3 Section 01 51 00 - Temporary Utilities.

.4 Section 07 21 13 – Board Insulation.

.5 Section 07 55 00 – Protected Membrane Roofing.

.6 Section 07 62 00 – Sheet Metal Flashing & Trim.

.7 Section 07 27 10 – Air Barriers.

1.2 ALTERNATE PRICE INFORMATION

.1 In relation to Cavity Wall Insulation only, this section is supplied for **INFORMATION ONLY for the purposes of providing the Alternate Price** required in Section 00 22 00 – 'Supplementary Bid Form'. Note that base cavity wall insulation is rigid board as specified in Section 07 21 13 and shown on drawings

.2 Notwithstanding this alternate price, other areas requiring spray foam insulation remain as part of this section.

1.3 REFERENCES

.1 Canadian Urethane Foam Contractors' Association Inc. (CUFCA)

.2 Underwriters' Laboratories of Canada (ULC)

.1 CAN/ULC-S101-[1989], Fire Endurance Tests of Building Construction and Materials.

.2 CAN/ULC-S102-[1988(R2000)], Surface Burning Characteristics of Building Materials and Assemblies.

.3 CAN/ULC-S705.1-[01], Standard for Thermal Insulation Spray Applied Rigid Foam, Medium Density, Material Specification.

.4 CAN/ULC-S705.2-[02], Standard for Thermal Insulation Spray Applied Rigid Foam, Medium Density, Installer's Responsibilities-Specification.

1.4 TEST REPORTS

.1 Submit test reports, verifying qualities of insulation meet or exceed requirements of this specification, in accordance with Section 01 45 00 - Quality Control.

.2 Submit test reports in accordance with CAN/ULC-S101 for fire endurance and CAN/ULC-S102 for surface burning characteristics.

1.5 QUALITY ASSURANCE

.1 Applicators to conform to CUFCA Quality Assurance Program.

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1.6 SAFETY REQUIREMENTS

.1 Protect workers as recommended by CAN/ULC-S705.2 and manufacturer's recommendations:

.1 Workers must wear [gloves] [respirators] [dust masks] [long sleeved clothing] [eye protection] [protective clothing] when applying foam insulation.

.2 Workers must not eat, drink or smoke while applying foam insulation.

1.7 PROTECTION

.1 Ventilate area in accordance with Section 01 51 00 - Temporary Utilities.

.2 Ventilate area to receive insulation by introducing fresh air and exhausting air continuously during and [24] hour after application to maintain non-toxic, unpolluted, safe working conditions.

.3 Provide temporary enclosures to prevent spray and noxious vapours from contaminating air beyond application area.

.4 Protect adjacent surfaces and equipment from damage by overspray, fall-out, and dusting of insulation materials.

1.8 WASTE MANAGEMENT AND DISPOSAL

.1 Remove from site and dispose of all packaging materials at appropriate recycling facilities.

.2 Collect and separate for disposal paper, plastic, polystyrene, corrugated cardboard packaging material in appropriate on-site bins for recycling.

.3 Fold up metal banding, flatten and place in designated area for recycling.

.4 Dispose of waste foam daily in location designated by Consultant and decontaminate empty drums in accordance with foam manufacturer's instructions and CAN/ULC-S705.2.

.5 Divert metal drums from landfill to metal recycling facility as approved by Consultant and to CAN/ULC-S705.2.

1.9 ENVIRONMENTAL REQUIREMENTS

.1 Apply insulation only when surfaces and ambient temperatures are within manufacturers' prescribed limits.

Part 2 Products

2.1 MATERIALS

.1 Insulation: spray polyurethane to CAN/ULC-S705.1.

.1 Density: 30.4 kg/m3 (1.9 lb/ft3) minimum.

.2 Compressive Strength: >185 KPa (per ASTM D1622)

.3 Tensile Strength: > 330 KPa (per ASTM D1623)

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.4 Air Barrier Classification:

.1 Type III (NRC) - permeance: 0.02 L/sec/m2 maximum at 75 Pa pressure differential.

.2 Air Barrier System Performance with leakage not exceeding 0.0054 l/m^2 @75 Pa pressure when tested in Accordance with CCMC Air Barrier System Requirements.

.3 All manufacturers/applicators shall submit test data reports prior to acceptance.

.5 Water Permeance: 125 ng/Pa.m2.s @25mm specimen thickness

.6 Submit manufacturer's Material Data Safety Sheets in accordance with and Sections 013300 – Submittal Procedures and 013530 – Health and Safety.

.7 Thickness: 50 mm (2.0 in.) .

.8 Acceptable material: Products meeting these specifications by BASF Canada Inc: "Walltite ECO". Installation shall only be by applicators specifically approved by the manufacturer/distributor.

.9 Acceptable material: Heatlok 0240 and Polar Foam 7300, distributed by Demilic Inc., contact Clifford Strassburger, 1-519-896-9307.

.10 Acceptable material: CertaSpray Closed Cell Foam, distributed by Certain Teed Insulation Canada Inc.

.11 Acceptable materials: other manufacturers meeting or exceeding these specifications as approved in writing by the Architect following specification, WMIS and test data submission.

.2 Primers: in accordance with manufacturer's recommendations for surface conditions.

.3 Sheet Air/Vapour Barrier Transition Membrane and Thru-Wall Flashing:

.1 Self adhering SBS modified bitumen membrane reinforced with non-woven fibrous glass:

.1 Thickness: minimum 1.45 mm

.2 Water Vapour Permeance: 0.05 perms max value. (2.8 ng/Pa.m2.s)

.3 Air Permeance: less than 0.01 l/m2 at 75 Pa pressure differentials.

.4 Adhesion: 7 day min. Peel adhesion at 5 deg. C :

.1 to primed Concrete: > 20 N/cm

.2 to selfedge: > 20 N/cm

.3 to primed plywood: > 25 N/cm

.4 to metal: > 30 N/cm

.5 Submit manufacturer's Material Data Safety Sheets in accordance with and Sections 01333 – Submittal Procedures and 013520 – Health and Safety.

.6 Acceptable Material: Blueskin SA by Bakor and Blueskin TW as thru-wall transition at masonry locations.

.2 Overlap typically minimum 150 mm on all adjacent layers/materials or as detailed.

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Part 3 Execution

3.1 APPLICATION

.1 Apply insulation to clean surfaces in accordance with CAN/ULC-S705.2 and manufacturer's printed instructions. Use primer where recommended by manufacturer.

.2 Apply sprayed foam insulation in thickness as indicated.

3.2 WORKMANSHIP

.1 Certification

.1 Installation is to be only by certified CUFCA/NECA applicators and manufacturer of the product being applied. Applicator shall provide proof of both approvals.

.2 Examination

.1 Install insulation after building substrata materials are dry, thoroughly clean and capable of providing a firm, uniform bonding surface and temperatures are within the range recommended by product manufacturers.

.2 Verify that surfaces and conditions are suitable to accept work required in this section.

.3 Report, in writing, defects in surfaces or conditions which may adversely affect the performance of products installed under this section to the Consultant; prior to commencement of work.

.4 Do not commence work until defects have been corrected.

.3 Preparation-Sprayed Insulation:

.1 Mask and cover adjacent areas to protect from overspray.

.2 Apply primers for special conditions as required by foam manufacturer.

.3 Clean work area prior to commencing spray operations.

.4 Preparation-Peel & Stick Membrane:

.1 Prime all surfaces using Blueskin Primer by Bakor or primer specifically approved by membrane manufacturer. Allow primer to dry. Apply primer only to areas to receive membrane within the same working day, or reprime surfaces.

.5 Application-Sprayed Insulation:

.1 Apply insulation to clean surfaces in accordance with CAN/CGSB 51-39-92 and manufacturer's printed instructions. Use primer where recommended by manufacturer. Ensure full adhesion to transition membrane.

.2 Completely fill jambs of all hollow metal frames with insulation and ensure continuous contact with sheet membrane used at head of frames.

.6 Application-Peel & Stick membrane:

.1 Ensure membrane widths capable of sealing to all door opens at heads of frames.

.2 Lap sides and ends a minimum of 100 mm or as per details. Ensure full adhesion as per details.

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.3 Position membrane for alignment with release film in place. Roll back, remove release film and press firmly in place. Roll all areas and laps with a steel or polyurethane roller.

.4 Seal ends of membrane to substrate using Polybithume by Bakor. or product approved specifically by membrane manufacturer.

.7 Tolerance

.1 Maximum variation from required thickness for sprayed insulation: 6 mm.

.8 Firestopping

.1 Required in all cavity walls 25 mm air space or greater.

.2 Install firestopping at 20 m intervals maximum horizontally and 3 m maximum vertically, in accordance with OBC requirements and manufacturer's approved method of Roxul AFB and transition membrane protection.

.3 At wall extending more than 1 storey in height, install additional firestopping horizontally at intermediate floor elevation.

3.3 LOCATIONS

.1 Cavity Walls Above Grade: **as an alternate price to Rigid Cavity Installation** – see Section 01 11 00 - Supplementary Information Form. Alternate Price to substitute Spray Urethane Foam insulation to all cavity walls,(complete with specified Blueskin Air/Vapour Barrier as transition membrane) and including mineral wool horizontal and vertical fire stopping to perimeter of the building cavity as required by OBC Division B, all in lieu of the specified Rigid Board Insulation system. Spray insulation is to include a 450mm high band of the specified rigid board insulation at the base of the wall cavity below the foamed in place insulation.

.2 On all structural steel in concealed locations exterior to insulated wall assemblies where steel penetrates through thermal barrier of wall forming a "cold bridge, whether shown on drawings or not.

.3 Concealed within Soffit Conditions: Refer to drawings.

.4 Jambs of Hollow Metal Frames: Refer to Section 081115 – Door Schedule.

.5 Behind Metal Siding/composite panels: Refer to Section 074143 – Aluminum Composite Panels.

.6 All other miscellaneous locations to ensure integrity of a continuous air/vapour barrier and insulation layer.

END OF SECTION

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Part 1 General

1.1 SECTION INCLUDES

.1 Materials and installation methods providing [primary] air vapour barrier materials and assemblies.

.2 Air/vapour barrier materials to provide continuous seal between components of building envelope and building penetrations.

1.2 RELATED SECTIONS

.1 Section 04 21 13 – Masonry.

.2 Section 07 51 12 – Built-Up Bituminous (BUR) Roofing.

.3 Section 07 46 13 – Preformed Metal Cladding Siding.

.4 Section 07 21 19 – Spray in Place Urethane Foam Insulation.

.5 Section 07 62 00 – Sheet Metal Flashing & Trim.

1.3 REFERENCES

.1 Canadian Construction Documents Committee

.1 CCDC 2 - Stipulated Price Contract.

.2 Canadian General Standards Board (CGSB)

.1 CAN/CGSB-19.13M-[M87], Sealing Compound, One Component, Elastomeric Chemical Curing.

.2 CAN/CGSB-19.18M-[M87], Sealing Compound, One Component, Silicone Base Solvent Curing.

.3 CAN/CGSB-19.24M-[M90], Multi-Component, Chemical Curing Sealing Compound.

.4 CGSB 19-GP-14M-[76], Sealing Compound, One Component, Butyl-Polyisobutylene Polymer Base, Solvent Curing.

.3 NBCC 1995; Part 5 - Environmental Separation

.4 Sealant and Waterproofer's Institute - Sealant and Caulking Guide Specification.

1.4 SUBMITTALS

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

.2 Submit manufacturer=s product data sheets in accordance with Section 01 33 00 - Submittal Procedures.

.3 Submit manufacturer=s installation instructions in accordance with Section 01 33 00 - Submittal Procedures.

1.5 QUALITY ASSURANCE

.1 Perform Work in accordance with Sealant and Waterproofer's Institute - Sealant and Caulking Guide Specification requirements for materials and installation.

.2 Maintain one copy of documents on site.

1.6 QUALIFICATIONS

.1 Applicator: Company specializing in performing work of this section with documented experience with installation of air/vapour barrier systems. Completed installation must be approved by the material manufacturer. .

.2 Applicator: Company who is currently licensed by National Air Barrier Association or certifying organization must maintain their license throughout the duration of the project.

1.7 DELIVERY, STORAGE AND HANDLING

.1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements.

.2 Deliver, store and handle materials in accordance with manufacturer=s written instructions.

.3 Avoid spillage. Immediately notify Consultant if spillage occurs and start clean up procedures.

.4 Clean spills and leave area as it was prior to spill.

1.8 WASTE MANAGEMENT AND DISPOSAL

.1 Place materials defined as hazardous or toxic waste in designated containers.

.2 Ensure emptied containers are sealed and stored safely for disposal away from children.

1.9 PROJECT ENVIRONMENTAL REQUIREMENTS

.1 Do not install solvent curing sealants or vapour release adhesive materials in enclosed spaces without ventilation.

.2 Ventilate enclosed spaces in accordance with Section 01 51 00 - Temporary Utilities.

.3 Maintain temperature and humidity recommended by materials manufactures before, during and after installation.

1.10 SEQUENCING

.1 Sequence work to permit installation of materials in conjunction with related materials and seals.

Part 2 Products

2.1 SHEET MATERIALS

.1 Refer to technical data sheets for physical properties of product.

.2 Sheet Seal Type [1]: Self-Adhesive bitumen laminated to high-density polyethylene film, nominal total thickness of 1 to 4 mm as indicated.

.1 Acceptable material: Bakor Blueskin SA, adhesive grade membrane, use ‘peel and stick’ Blueskin where Air-Bloc 21 not present or equal Blueskin SA or TG or Soprema ‘Sopraseal Stick.’

.2 Sealant and Adhesive as recommended by Manufacturer.

.3 Transition membrane adhesive to be Bakor Air-Bloc 21.

.4 Air Barrier Membrane to be Bakor Air-Bloc 21.

.5 Acceptable materials: with same characteristics as above by W.R. Grace and Soprema.

2.2 SEALANTS

.1 Sealants in accordance with Section 07 92 10 - Joint Sealing.

.2 Primer: Recommended by sealant manufacturer and Appropriate to application.

.3 Substrate Cleaner: Non-corrosive type recommended by sealant manufacturer and compatible with adjacent materials.

2.3 ADHESIVES

.1 Adhesive to be ‘Air-Bloc 21’ by Bakor.

2.4 ACCESSORIES

.1 Thinner and cleaner for As recommended by sheet material manufacturer.

.2 Stick-Clips: Perforated Galvanized steel anchors.

Part 3 Execution

3.1 EXAMINATION

.1 Verify that surfaces and conditions are ready to accept the Work of this section.

.2 Ensure all surfaces are clean, dry, sound, smooth, continuous and comply with air barrier manufacturer=s requirements.

.3 Report any unsatisfactory conditions to the Consultant in writing.

.4 Do not start work until deficiencies have been corrected. Commencement of Work implies acceptance of conditions.

3.2 PREPARATION

.1 Remove loose or foreign matter which might impair adhesion of materials.

.2 Ensure all substrates are clean of oil or excess dust; all masonry joints struck flush, and open joints filled; and all concrete surfaces free of large voids, spalled areas or sharp protrusions.

.3 Ensure all substrates are free of surface moisture prior to application of self-adhesive membrane and primer.

.4 Ensure metal closures are free of sharp edges and burrs.

.5 Prime substrate surfaces to receive adhesive and sealants in accordance with manufacturer's instructions.

3.3 INSTALLATION

.1 Install materials strictly in accordance with manufacturer's instructions.

.2 Apply sealant within recommended application temperature ranges. Consult manufacturer when sealant cannot be applied within these temperature ranges.

3.4 PROTECTION OF WORK

.1 Protect finished Work in accordance with Section 01 61 00 - Common Product Requirements.

.2 Do not permit adjacent work to damage work of this section.

.3 Ensure finished Work is protected from climatic conditions.

3.5 SCHEDULES

.1 Wall Air/Vapour Barrier Over Outer Surface of Inner Wythe of Masonry: Trowel seal Type F over masonry unit surface to a thickness of 6 mm, seal masonry anchor penetrations air tight.

.2 Wall Air/Vapour Barrier Over Exterior Surface of Gypsum Sheathing: Place sheet seal Type G over sheathing surfaces with Adhesive Type E. Seal with Type Y sealant.

.3 Window Frame Perimeter: Lap sheet seal Type H from wall air seal surface with 75 mm of full contact over firm bearing to window frame with 25 mm of full contact. Edge seal with Type Z sealant.

.4 Wall and Roof Junction: Lap sheet seal Type J from wall seal material with 150 mm of contact over firm bearing to roof air seal membrane with 100 mm of full contact. Seal with Type X sealant.

.5 Roof System Air/Vapour Barrier Over Steel Deck: Gypsum sheathing, taped joints, apply membrane air seal Type K over sheathing surfaces with Adhesive Type D; edge seal membrane with Type Y sealant.

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

.1 Requirements for the installation of preformed metal cladding/siding and screen work.

1.2 RELATED SECTIONS

.1 Section 01 33 00 - Submittal Procedures.

.2 Section 05 31 00 – Steel Deck

.3 Section 06 10 11 – Rough Carpentry.

.4 Section 04 21 13 – Masonry.

.5 Section 07 21 19 – Sprayed in Place Urethane Foam Insulation.

.6 Section 07 41 43 – Aluminium Composite Panels

1.3 REFERENCES

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

.1 ASTM A653/A653M - 09a, Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.

.2 ASTM A775/A775M - 07b, Standard Specification for Epoxy-Coated Steel Reinforcing Bars

.2 American National Standards Institute (ANSI).

.1 ANSI B18.6.4-1998 (R2005), Screws, Tapping and Metallic Drive, Inch Series, Thread Forming and Cutting.

.3 Canadian General Standards Board (CGSB).

.1 CGSB 93.5-92, Installation of Metal Residential Siding, Soffits and Fascia.

.4 Canadian Standards Association (CSA International).

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

.2 CAN/CSA-G40.20/G40.21M-04, General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steels.

.3 CSA S136-07, Cold Formed Steel Structural Members.

1.4 DESIGN REQUIREMENTS

.1 Design metal siding system in accordance with CSA S136, and to withstand live, dead, lateral, wind, seismic, handling, transportation, and erection loads.

.2 Design metal siding system in accordance with Climatic Design Data contained in Ontario Building Code.

.3 Design metal siding system to limit deflection under design loads, to L/240.

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.4 Design metal siding system to prevent restriction of thermal induced movement which would induce deformation such as warping, buckling, and failure of joint seals and fasteners. Design metal siding system to prevent vibration when subject to the effects of wind.

.5 Design miscellaneous, additional structural framing members and sag rods, required to complete metal siding system, where not indicated on Contract Drawings.

1.5 SUBMITTALS

.1 Shop Drawings:

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

.2 Indicate arrangement of sheets and joints, types and locations of fasteners and special shapes and relationship of panels to structural support members or support wall.

.3 Clearly detail and indicate locations of all Z clips, J-closures and edge trims.

.4 Describe in shop drawing details, suitable accommodation for the removal and joining of future cladding as described in 1.2.7 of this section and on drawings.

.2 Samples:

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

.2 Submit duplicate 300 x 300 mm samples of siding material, of colour and profile specified.

.3 Reports: Submit written field inspection and test report results after each inspection.

.4 Manufacturer's Instructions:

.1 Submit manufacturer's installation instructions.

1.6 QUALITY ASSURANCE

.1 Retain a licensed Professional Engineer, registered in Province of Ontario, to perform following services for metal siding Work:

.1 Design of metal siding Work.

.2 Review, stamp, and sign shop drawings.

.3 Conduct shop and field inspections and prepare and submit inspection reports.

.2 Mock-up:

.1 Fabricate, deliver, and erect one full scale 1200 mm wide x 1800 mm high mock-up panel of metal siding construction, in location acceptable to Consultant.

.2 Demonstrate finish, colours, and quality of workmanship.

.3 Mock-up may form part of final Work, if acceptable to Consultant. Remove and dispose of mock-ups which do not form part of Work.

.3 Pre-installation meeting: Arrange with manufacturer's representative, Contractor, and Consultant to inspect substrates, and to review installation procedures 48 hours in advance of installation.

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1.7 DELIVERY, STORAGE, AND HANDLING

.1 Stockpile panels tilted to provide water run-off, free from ground contact on firm, level, non-staining supports extending full width of sheet and spaced not more than 450 mm apart. Cover components with opaque polyethylene sheet. Vent to allow air movement.

1.8 WASTE MANAGEMENT AND DISPOSAL

.1 Divert used metal cut-offs from landfill by disposal removed for disposal at the nearest metal recycling facility.

.2 Divert reusable materials for reuse at nearest used building materials facility.

.3 Divert unused caulking, sealants, and adhesive materials from landfill through disposal at hazardous material depot.

1.9 EXTENDED WARRANTY

.1 Submit a warranty for metal siding system, covering materials and labour and the repair or replacement of defective work in accordance with the Contract, but for five (5) years total.

Part 2 Products

2.1 ACCEPTABLE MANUFACTURERS

.1 Metal siding:

.1 Peerless Enterprises or VicWest Steel Inc.

2.2 MATERIALS – METAL SIDING/SOFFIT

.1 For copings and flashings, provide prefinished metal 24 gauge thickness, colours as specified in Section 076200- Sheet Metal Flashing and Trim.

.2 For metal framing refer to Contract Drawings.

.3 Profile to match **Vicwest 7/8 Corrugated siding**.

.4 Colour: To be selected by Architect for manufacturer's full colour range.

.5 Structural shapes, plates, sag rods, and similar items: CAN/CSA-G40.20-G40.21-M, Grade 300W.

.6 Hollow structural sections: CAN/CSA-G40.20/G40.21-M Grade 350W, Class H.

.7 Screws: to ANSI B18.6.4, stainless steel Type 304; nylon head colour same as exterior sheet.

.8 Powder actuated fasteners: galvanized, peened ballistic point, plastic cap of same color as exterior sheet.

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.9 Sealants: in accordance with Section 079210- Joint Sealers, colour selected by Consultant. Allow for one (1) colour from manufacturers full range to match adjacent metal.

.10 Gaskets: soft pliable arctic grade vinyl, extruded profile.

.11 Touch-up paint: as recommended by panel manufacturer and Baycoat, compatible with prefinished coating.

.12 Isolation coating: alkali resistant bituminous paint or epoxy resin solution.

.13 Insulation: As noted on Drawings and in Section 072113 – Board Insulation, and sections pertaining to Insulation and Sheet Air/Vapour Barrier transition membrane.

2.3 COMPONENTS – METAL SIDING

.1 Exterior sheet: factory preformed coated metal, to profiles and thicknesses as indicated.

.2 Exterior corners: of same profile, material and finish as adjacent siding material, shop cut and brake formed to required angle, concealed corner brace, hairline exposed joint, pop rivet connections with painted head to match siding.

.3 Exposed joint ends of siding sheet shop cut clean and square, backed with tight fitting filler lapping back if joint, exposed components color matched to siding.

.4 Accessories: cap flashings, drip flashings, internal corner flashings, copings and closures for head, jamb, eaves, soffits sill and corners, of same material and finish as exterior siding, brake formed to shape. Exposed cut edges of metal profiles will not be accepted.

.5 Sub-girts: zinc coated to ASTM A653, G90 coating designation, profile as indicated to accept exterior sheet with structural attachment to building frame.

Part 3 Execution

3.1 GENERAL

.1 Compliance: comply with manufacturer's written data, including product technical bulletins, product catalogue installation instructions, product carton installation instructions, and data sheets.

3.2 INSTALLATION

.1 Install cladding in accordance with CGSB 93.5, reviewed shop drawings and manufacturer's written instructions.

.2 Supply and install miscellaneous, additional structural framing members, required to complete metal siding system, where not indicated on Contract Drawings.

.3 Maintain joints in exterior siding, plumb, true to line, tight fitting, hairline joints.

.4 Attach metal siding system components to prevent warping, buckling, and deformation induced by restriction of thermal induced movement.

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.5 Install sub-girts to masonry walls prior to the installation of the Urethane foam insulation

.6 Install exterior finish siding to internal sub-girts with concealed fasteners.

.7 Coordinate with mechanical Sections as required for ensure metal solar wall system is connected to fan inlet and ventilation system.

.8 Provide notched and formed closures, sealed to arrest direct weather penetration at vertical profiles for exterior siding. Ensure continuity of "pressure equalization" of rain screen principle.

.9 Provide alignment bars, brackets, clips, inserts, shims as required to securely and permanently fasten wall system to building structure.

.10 Supply and install flashing at connection between roof and preformed metal siding.

.11 Touch up marred surfaces with air dry formulation to match pre-finished siding if approved by Consultant, otherwise remove and replace damaged metal siding.

3.3 CONTROL JOINTS

.1 Construct control joints, as indicated.

.2 Use cover sheets, of brake formed profile, of same material and finish as adjacent material.

.3 Use mechanical fasteners to secure sheet expansion joints materials.

.4 Assemble and secure wall system to structural frame so stresses on sealants are within manufacturer's recommended limits.

3.4 CLEANING

.1 Upon completion of installation, remove surplus materials, rubbish, tools and equipment barriers.

.2 Wash down exposed surfaces using solution of mild domestic detergent in warm water, applied with soft clean wiping cloths.

.3 Remove excess sealant with recommended solvent.

END OF SECTION

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Part 1 General

1.1 REFERENCES

.1 American Society for Testing and Materials (ASTM)

- .1 ASTM C 36-[97], Standard specification for Gypsum Board.
- .2 ASTM C 1002-[98], Specification for Steel Drill Screws for the Application of Gypsum Board or Metal Plaster Bases.
- .3 ASTM D 1863-[86], Specification for Mineral Aggregate Used on Built-up Roofs.
- .4 ASTM D 2178-[97a], Specification for Asphalt Glass (Felt) Used in Roofing and Waterproofing.
- .5 ASTM D 4601-[97a], Specification for Asphalt Coated Glass Fiber Base Sheet Used in Roofing.

.2 Canadian General Standards Board (CGSB)

- .1 CAN/CGSB-37.5-[M89], Cutback Asphalt Plastic Cement.
- .2 CAN/CGSB-37.8-[M88], Asphalt, Cutback, Filled, for Roof Coating.
- .3 CGSB 37-GP-9Ma-[83], Primer, Asphalt, Unfilled, for Asphalt Roofing, Dampproofing and Waterproofing.
- .4 CGSB 37-GP-15M-[84], Application of Asphalt Primer for Asphalt Roofing, Dampproofing and Waterproofing.
- .5 CGSB 37-GP-19M-[76(R1985)]Cement, Plastic, Cutback Tar.
- .6 CGSB 37-GP-21M-[76(R1985)], Tar, Cutback, Fibrated, for Roof Coating.
- .7 CAN/CGSB-37.28-[M89], Reinforced Mineral Colloid Type, Emulsified Asphalt for Roof Coatings and Waterproofing.
- .8 CAN/CGSB-37.29-[M89], Rubber-Asphalt Sealing Compound.
- .9 CAN/CGSB-51.25-[M87], Thermal Insulation, Phenolic, Faced.
- .10 CAN/CGSB-51.26-[M86], Thermal Insulation, Urethane and Isocyanurate, Boards, Faced.
- .11 CAN/CGSB-51.33-[M89], Vapour Barrier Sheet, Excluding Polyethylene, for Use in Building Construction.
- .12 CGSB 51-GP-38M-[76], Thermal Insulation, Cellular Glass, Pipe Covering, Block and Board.

.3 Canadian Standards Association (CSA)

- .1 CSA A123.2-[M1979(R1992)], Asphalt Coated Roofing Sheets.
- .2 CSA A123.3-[M1979(R1992)], Asphalt or Tar Saturated Roofing Felt.
- .3 CSA A123.4-[M1979(R1992)], Bitumen for Use in Construction of Built-Up Roof Coverings and Dampproofing and Waterproofing Systems.
- .4 CSA A231.1-[1972], Precast Concrete Paving Slabs.
- .5 CAN/CSA-A247-[M86(R1996)], Insulating Fibreboard.
- .6 CSA A284-[1976], Mineral Aggregate Thermal Roof Insulation.
- .7 CAN/CSA-ISO[9001] [9002] [9003], Requirements for Quality Assurance, Parts 1, 2 and 3.
- .8 CAN/CSA-ISO 14001-[96], Environmental Management Systems - Specifications with Guidance for Use.

.9 CSA O121-[M1978], Douglas Fir Plywood.

.10 CSA O151-[M1978], Canadian Softwood Plywood.

.4 Canadian Roofing Contractors= Association (CRCA)

.1 CRCA Specification.

.5 Underwriters= Laboratories of Canada (ULC)

.1 CAN/ULC-S701-[97], Standard for Thermal Insulation, Polystyrene, Boards and Pipe Covering.

.2 CAN/ULC-S702-[97], Standard for Mineral Fibre Thermal Insulation for Buildings.

.3 CAN/ULC-S704-[98], Thermal Insulation, Urethane and Isocyanurate, Boards, Faced.

.4 CAN/ULC-S706-[98], Insulated Fiberboard.

1.2 CO-ORDINATION

.1 Co-ordinate work of this Section with Related Work specified in other Sections to insure construction schedule is maintained and water tightness and protection of the building and finished work is maintained at all times.

.2 Co-ordinate work with other trades and provide materials and methods compatible with other materials and methods in order to maintain air/vapour barrier tightness of the building envelope.

.3 Co-ordinate supply and installation of air seals under all wood blocking with various trades. Also co-ordinate trades for tying in the air/vapour barrier of the roof/wall junction at all walls, perimeter eaves and parapets.

1.3 SUBMITTALS

.1 Submit to the Architect/ Consultant a list of all materials intended for use before they are ordered.

.2 Provide written declaration that all components and materials are compatible with each other and are covered under one common warranty.

.3 Submit samples of materials intended for use in accordance to Section 013300 – Submittal Procedures.

.4 Manufacturer’s Instructions: Provide to indicate special handling criteria, installation sequence, and cleaning procedures.

1.4 PRODUCT DATA

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

1.5 DELIVERY, STORAGE AND HANDLING

.1 Deliver, handle, store and protect materials of this section in accordance with Section 01 61 00 - Common Product Requirements.

.2 Provide and maintain dry, off-ground weatherproof storage.

.3 Store materials on supports to prevent deformation.

.4 Remove only in quantities required for same day use.

.5 Store materials in accordance with manufacturers written instructions.

.6 Store insulation protected from sunlight and weather and deleterious materials.

.7 Identification for delivery: indicate on containers or wrappings of and materials:

.1 Manufacturer's name and brand.

.2 Compliance with applicable standard.

.3 Mass where applicable.

.8 Deliver materials in original containers, sealed, with labels intact. Ensure that shelf life of materials has not expired.

.9 Keep material storage on roof to a minimum. Keep covered and protect stored materials from moisture and degrading effects of the sun. Elevate on raised platform minimum 100mm. Remove only those required for day's operation.

.10 Provide WHIMS Material Safety Data Sheets for materials supplied.

.11 At temperature below 5ºC, store membrane roofing, adhesive and sealants that will be affected by temperature in dry heated storage. Remove product immediately prior to installation.

.12 Protect edges of roll goods. Stand on end to prevent flattening.

.13 Deliver fasteners in boxes or kegs and keep in protective storage until used. Do not oil or grease fasteners.

.14 Remove damaged and/or rejected materials from site.

1.6 WASTE MANAGEMENT AND DISPOSAL

.1 Place materials defined as hazardous or toxic waste in designated containers.

.2 Ensure emptied containers are sealed and stored safely for disposal away from children.

.3 Fold up metal banding, flatten and place in designated area for recycling.

.4 Plan and coordinate insulation work to minimize generation waste.

.5 Collect and separate plastic and/or paper packaging for recycling.

.6 Give preference to suppliers who take back mineral fibre insulation waste for reuse or recycling.

.7 Use the least toxic sealants and adhesives necessary to comply with requirements of this section.

.8 Close and seal, tightly, all partly used sealant and adhesive containers and store protected in well ventilated, fire-safe area at moderate temperature.

.9 Place used hazardous sealant tubes and adhesive containers in areas designated for hazardous materials.

.10 Collect, package and store partly used or unused containers of asphalt, sealing compounds, primers and roofing felts for recycling, and return to recycler.

1.7 PROJECT/SITE ENVIRONMENTAL REQUIREMENTS

.1 Temperature, relative humidity, moisture content.

.1 Apply built-up bituminous membranes only when surfaces and ambient temperatures are within manufacturers' prescribed limits.

.2 Do not install built-up bituminous membranes when air and substrate temperature remains below 5EC in accordance with manufacturer's recommendations or when wind chill gives equivalent cooling effect.

.3 Install built-up bituminous membranes on dry substrate, free of snow and ice, use only dry materials and apply only during weather that will not introduce moisture into system.

.2 Safety: Comply with requirements of Workplace Hazardous Materials Information System (WHMIS) regarding use, handling, storage, and disposal of asphalt, sealing compounds, primers and caulking materials.

.3 Ventilation:

.1 Ventilate enclosed spaces in accordance with Section 01 51 00 - Temporary Utilities.

.2 Provide continuous ventilation during and after dampproofing application. Run ventilation system 24 hours per day during installation; provide continuous ventilation for 7 days after completion of dampproofing installation.

1.8 QUALIFICATIONS

.1 Contractors must be experienced and approved for application of the materials and system being installed and have been responsible for satisfactory installation similar to that specified.

.2 By submitting this Tender the Contractor represents they have the special qualifications, training and experience for performing the work.

.3 Provide a competent foreman to supervise all work and act as the Contractors representative on site. Employ only experienced and qualified workers and ensure that workmanship conforms to best trade practices. Replace all work that results from inferior products or workership.

.4 Review contract documents with material manufacturer for products intended for use. Obtain mutual agreement and provide a letter co-signed by the manufacturer, that the details and specifications are appropriate and adequate for the construction and or renovations set out.

.5 In submitting their bid the Contractor reconfirms to be a member in good standing of the Canadian Roofing Contractors' Association and have been established as a roofing Contractor a minimum of five years and have adequate plant, equipment and skilled tradesmen to perform expeditiously and are known to have been responsible for satisfactory installations similar to that specified.

.6 In submitting their bid the Contractor confirms and represents to have the special qualifications for doing the work, and that the details and specifications are in their opinion appropriate and adequate for the construction described.

.7 In submitting their bid the Contractor acknowledges to be a trained and approved applicator for the materials and membrane systems specified.

1.9 SPECIAL PROTECTION

.1 Protect adjacent work, buildings, grounds and other property from damage during roofing operations. Locate garbage removal chutes and equipment away from locations where smoke and dust could be detrimental to the building or its occupants. Protect walls with tarpaulins in chute, hoisting and pumping areas.

.2 Proceed with caution. Use equipment that will not damage or impair the function of the deck.

.3 Do not overload the structure with materials or equipment.

.4 Remove all tools or equipment overnight that could be used to provide access to the building or used by persons intent on doing damage.

.5 Materials such as adhesives, solvents and thinners must be stored in well vented areas away from exists and air intake vents to avoid a build up of poisonous and caustic chemicals.

.6 Store solvent soaked cleaning rags in approved container, in a location to prevent a threat to fire safety or health of the building's occupants or workers. Dispose from site daily.

.7 Co-ordinate work to ensure that special protection against damage from traffic or work performed on top of completed roofing is provided.

.8 Protect roofing used as working platform by plywood sheets installed over work area including hoisting, pumping and traffic zones. Underlay platform with polyethylene when installed directly over bituminous membrane. Remove when not in use, otherwise weight down to prevent removal by wind.

.9 Remove and dispose asphalt mops from roof and site at end of working day. Storage arrangements shall provide free access of air to mops to minimize the possibility of spontaneous combustion. Mops to be stored in safe location to prevent the spread of fire should spontaneous combustion occur.

.10 Disconnect propane burners and torches from heating containers when not in use. Store heating fuel in protected area away from ignition sources and buildings.

.11 Fire Extinguishers: maintain one stored pressure rechargeable type with hose and shut-off nozzle, ULC labelled for A, B and C class protection. Size 10 kg on roof per torch applicator, within 10 m of torching operation.

.12 Maintain fire watch for 1.5 hours after each days roofing operations cease.

1.10 QUALITY CONTROL

.1 The roof inspection and testing shall in no way relieve the roofing contractor from his responsibility or obligation under the terms of the Contract.

.2 If the initial inspection and tests required to establish compliance with the Contract Documents indicate non-compliance with the Contract Documents, subsequent testing or re-inspection occasioned by non-compliance shall be performed. The cost of re-inspection and testing will be borne by the Contractor and deducted from the price of the Contract.

1.11 AIR TIGHTNESS

.1 Co-ordinate work with other trades and provide materials and methods compatible with other materials and methods in order to maintain air/vapour barrier tightness of the building envelope.

.2 Co-ordinate supply and installation of air seals under all wood blocking with various trades. Also co-ordinate trades for tying in the air/vapour barrier of the roof/wall junction at all walls, perimeter eaves and parapets.

1.12 WARRANTY

.1 Provide a written warranty signed and issued in the name of the Owner stating that the Contractor and Sub-Contractor jointly and severally warrant the complete roofing, and sheet metal flashing system against leakage, degradation of materials and thermal value, failure to stay in place, undue expansion, deformation, delamination, buckling, ridging, and splitting or loosening of seams, failure to adhere, deterioration, blistering, dislodged surfacing, and degradation of colour that detracts from performance or visual appearance and defective workmanship. All defects shall be repaired to restore the roof to good condition to the original Drawings and Specifications.

.2 The guarantee period shall be two years from date of Substantial Completion of the Building.

.3 Form of guarantee is enclosed.

.4 In addition to the 2 year specified guarantee provide the material manufacturers extended 10 year watertight warrantee covering labour, material and workmanship. The cost of the extended warrantee shall be included in the overall contract price. All roofing components must be supplied and/or pre-approved by the membrane manufacturer in order to comply with the acceptance criteria of the workmanship warranty.

1.13 SCHEMATIC ROOF DESIGNS

.1 Refer to Parts 2 and 3 for details on materials and installation procedures

.2 Roofs at steel deck:

.1 aggregate and bitumen surfacing
.2 1 ply #15 felt and 4 plies type IV felt and asphalt roofing membrane
.3 fiberboard/ tapered insulation
.4 86 mm polyisocyanurate insulation,
.5 Kraft paper vapour barrier
.6 Steel deck or acoustic deck with flute insulation

Part 2 Products

2.1 COMPATIBILITY

.1 Compatibility between components of system and adjacent materials is essential. Provide written declaration to Consultant stating that materials and components, as assembled in system, meet this requirement.

2.2 VAPOUR RETARDER

.1 Single layer of a ULC approved asphalt laminated sheet (kraft paper) conforming to CAN/CGSB-51.33-M80, type 2 and ULC approved fire retardant adhesive as manufactured by IKO, Johns Manville or approved equal.

2.3 AIR SEAL

.1 Self-adhering Grade SBS Modified Bitumen minimum thickness 3.0mm, with minimum 180g/sq.m., polyester reinforcement, Type II, Class C, Grade 2 and conforming to CGSB 37-GP-56M as supplied by Bakor, IKO, Johns Manville, Siplast, or Soprema.

2.4 POLYISOCYANURATE ROOF INSULATION

.1 Polyisocyanurate foam rigid insulation boards 3.4" (88 mm) thick. Insulation boards to be Type 3, Class 2, manufactured with HC blowing agent (Pentane) bonded to glass fibre reinforced facers on top and bottom surfaces during the manufacturing process. Standard of acceptance to be E'NRG'Y3 as manufactured by Johns Manville or approved equal. Maximum board size: 1200 mm x 1200 mm. Insulation Boards to meet the following requirements:

.2 Approved and listed by Factory Mutual Global for Class 1-60, 1-75, and 1-90 windstorm classification and meeting FM4470 approval requirements for Class 1 fire as a component in roof deck construction.

.3 Meet the physical property requirements of ASTM C 1289 and CAN/ULC S-704.

.4 Dimensional stability change of less than 2% conforming to ASTM D 2126.

.5 Conformity to CAN/ULC S704 and Can/ULC S770 for Long Term Thermal Resistance in polyisocyanurate insulation.

2.5 TAPERED FIBREBOARD

.1 Tapered high density fibreboard insulation min. 45 psi. meeting the requirements of CAN/CSA A-247-M86 and CAN/ULC-S706. Tapered insulation per the tapered layout.

.1 Acceptable Material: High Density Fibreboard insulation as supplied by Posi-Slope or Accuplane

2.6 OVERLAY FIBREBOARD

.1 Overlay insulation is to be a minimum 13 mm on flat areas. Insulation to be high density fibreboard insulation min. 45 psi. meeting the requirements of CAN/CSA A247-M86 and CAN/ULC-S706. Install overlay insulation as indicated on drawings.

.2 Overlay insulation at parapets and flashings to be torchable 13 mm recover board by Johns Manville or 13 mm Sopraboard by Soprema.

2.7 PRIMERS

.1 Asphalt primer: to CGSB 37-GP-9Ma.

.1 Acceptable material: as recommended by manufacturer.

.2 Zinc rich, ready mix to CAN/CGSB-1.181-92.

.1 Acceptable material: as recommended by manufacturer.

2.8 BUILT-UP MEMBRANE

.1 1 Ply #15 felt and 4 plies type IV felt asphalt and felt built-up conventional membrane roof and waterproofing system.

2.9 BITUMEN

.1 Asphalt: to CSA A123.4, Type 2 and 3.

2.10 FELTS

.1 Saturated organic felts: to CSA A123.3 No.15, saturated asphalt.

.1 Acceptable material: Bakor, IKO, Johns Manville or Soprema.

.2 Saturated glass fibre felts: to ASTM D 2178, Type IV-ply sheet.

.1 Acceptable material: Bakor, IKO, Johns Manville or Soprema.

2.11 SEALERS

.1 Plastic cement: asphalt, to CAN/CGSB-37.5.

.1 Acceptable material: as recommended By manufacturer.

.2 Sealing compound: to CAN/CGSB-37.29, rubber asphalt type.

.1 Acceptable material: as recommended by manufacturer.

.3 Sealant: in accordance with Section 07 92 10 - Joint Sealing not contain total of volatile organic compounds in excess of [5] % by weight, asbestos-free sealant, compatible with systems materials, recommended by system manufacturer.

.4 Polyurethane Caulking: 1 part Polyurethane compound for concealed horizontal metal joints, and reglets and exterior uses to CAN/CGSB Standard 19.13-M87. "Dymonic" by Tremco Ltd. or approved equivalent. Use colour to match adjacent materials

.5 Caulking: Silicone to CAN/CGSB 19.18-M87.

2.12 CANT STRIPS

.1 Cut from 75 mm x 75 mm x 38 mm thick fibreboard material to measure 140 mm on slope.

2.13 MEMBRANE FLASHING

.1 Base Sheet Flashing

.1 Self-adhering Grade SBS Modified Bitumen minimum thickness 3.0mm, with minimum 180g/sq.m., polyester reinforcement, Type II, Class C, Grade 2 and conforming to CGSB 37-GP-56M as supplied by Bakor, IKO, Johns Manville, Siplast, or Soprema.

.2 Cap Sheet Flashing

.1 Torch Grade SBS Modified Bitumen minimum thickness 4mm, with minimum 180g/sq.m., non-woven polyester reinforcement, Type 1, Class A, Grade 2, and conforming to CGSB 37-GP-56M as supplied by Bakor, IKO, Johns Manville, Siplast, or Soprema.

.3 Primer for Self Adhering Base Sheet

.1 Synthetic rubber based primer Elastocolle 500 by Soprema or equal.

2.14 FASTENERS

.1 All fasteners for steel, wood, concrete and specialty decks must meet factory mutual approvals.

.2 Use galvanized, copper, aluminum or stainless nails or screws as most compatible with materials being employed. Screws shall be minimum 38mm (1.5") #10 cadmium plated hex head with neoprene and steel washers by Atlas Bolt or approved equal. Rawl lead shields as required for anchoring. Use fasteners as most generally suitable to Consultant's approval.

.3 General Fasteners: #10 ardox nails of length to penetrate bases minimum 13mm (0.5"). Horizontal Membrane Fasteners: Use ardox 50mm (2.0") nails with minimum 25mm (1.0") solid caps for securing membrane to insulation stops.

.4 Vertical Flashing Fasteners: Nails, Tapgrip or Permagrip fasteners with 25mm (1.0") solid caps. Minimum length 38mm (1.5").

.5 Screws: Minimum 38mm (1.5") #10 cadmium plated hex head with neoprene and steel washers by Atlas Bolt or approved equal. Rawl lead shields as required for anchoring.

.6 Insulation to substrate: fasteners and plates must meet Factory Mutual 4470 Standard for wind uplift and corrosion resistance.

2.15 ROOF GRAVEL

.1 To ASTM D 1863, 10 mm x 16 mm, clean crushed stone, slag or gravel.

2.16 CONCRETE PAVERS

.1 Paving slabs: to CSA A231.1, 600 mm x 600 mm x 38 mm, precast concrete paving slabs welded wire mesh reinforced concrete paver with 6% - 8% air entrainment and to 30 MPa.

.2 Provide from existing roof access to new ladder at Addition and from roof access to new rooftop units providing a complete surround of pavers at each unit. Contractor to calculate number of units from roof plans.

2.17 PAVER PEDESTALS

.1 Pedestals and levelling plates made of high density polyethylene with integral spacer ribs on upper surface.

2.18 VENT STACK FLASHING

.1 SJ-24 pre-insulated spun aluminium with telescoping cap complete with stainless steel vandal proof cap by Thaler Metal Industries Inc. 80mm diameter, installation to conform to Local Plumbing Code. Confirm with Mechanical Section for size, number and location.

2.19 METAL SLEEVES

.1 Fabricate from one-piece 454 gms. (16.0 oz.) copper or 26 gauge stainless steel fabricated minimum 300mm (12.0") high above finished roof surface, with 125mm (5.0") flange as approved by the Consultant. All seams to be continuous and soldered.

2.20 SCUPPERS AND OVERFLOWS

.1 Size and materials as specified or shown, fabricated from 454 gms. (16.0 oz.) copper, 26 gauge stainless steel or 25 gauge PVC coated metal with minimum 125mm (5.0") roof flange and gravel guard to Consultant's approval. Make all seams continuous and watertight by soldering or heat welding.

2.21 BITUMINOUS METAL PAINT

.1 “Gilsonite Asphalt 410-02" by Monsey Bakor Inc. to CGSB1-GP-108 Type II.

2.22 B-VENT FLASHING

.1 MEF-4A by Thaler. Supplied by Mechanical Section and installed as approved by Roofing inspector.

2.23 SOURCE QUALITY CONTROL

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

.2 Submit laboratory test reports certifying compliance of bitumens and roofing felts with specification requirements.

Part 3 Execution

3.1 WORKMANSHIP

.1 Do work in accordance with applicable, standard in Canadian Roofing Contractors Association (CRCA)] Roofing Specifications Manual, except where specified otherwise.

.2 Do priming for asphalt in accordance with CGSB 37-GP-15M.

3.2 HEATING OF ASPHALT

.1 Asphalt to be heated in kettle or tanker sufficiently to provide correct EVT range at point of application.

.2 In cold weather insulate hauling equipment and re-circulation lines to minimize heat loss.

.3 Do not heat asphalt above its Final Blowing Temperature (FBT) in tanker.

.4 Heating asphalt above its FBT may be permissible in kettle as long as asphalt is used up within four hours.

.5 Equip kettle and tanker with working thermometers.

3.3 PLANT AND EQUIPMENT

.1 Do not use direct fired equipment.

.2 Use only kettles equipped with thermometers or gauges in good working order.

.3 Locate kettles in safe place outside of building or, if approved by Consultant, on noncombustible substrate at location to avoid danger of igniting combustible material below. When locating kettles, give consideration to direction of prevailing winds, building fans and air handling units to minimize possibility of smoke and fumes entering surrounding occupied buildings. If wind direction causes smoke and fume problems, relocate kettles on daily basis when directed by Consultant.

.4 Maintain supervision while kettles are in operation and provide metal covers for kettles to smother flames in case of fire. Provide suitable fire extinguishers.

.5 Maintain efficiency of kettles and equipment by frequent cleaning. Remove all carbonized bitumen.

.6 Use only fibreglass roofing mops.

3.4 PROTECTION AND SUBSTRATE EXAMINATION

.1 Review plans, specifications and drawings for the original and any subsequent alterations for the building's construction and interview those involved in the construction of the building. Investigate the location of services that may be installed under or in the deck,

built into the structure on or within the assembly. These services are to include but are not limited to mechanical, electrical, communications, lightning protection, cable, security and fire alarms. Ensure that all services are located and protected from damage from work under this contract.

.2 Inspect the surface for soundness and notify the Architect/Consultant in writing of any surface unsound and unsuitable for roofing. Do not commence work until you have documented conditions and obtained a ruling from the Architect/Consultant on the acceptability of surfaces and/or corrective measures required. The cost for any delays due to postponement of work that results from investigating the site problem or obtaining a ruling will be at the Contractor's expense.

.3 Before proceeding with roofing application, ensure that:

.1 All surfaces are clean of debris and free of snow, frost and moisture.

.2 Surface is clean and sufficiently dry to ensure specified adhesion will be obtained.

.3 Surface is sound, constructed smooth in true planes and levels or sloped to drains, in conformity to design intent.

.4 Surfaces are free of cracks that are wider than bridging ability of roofing materials.

.5 Adjacent construction and installation of work of others incorporated when roof is completed.

.6 Preparations have been made for bases on which equipment will be installed.

.7 Existing fasteners are tight and deck irregularities and levels are corrected to provide a suitable surface for new roofing.

.8 Curbs have been built.

.9 Drains have been installed at proper elevations relative to finished roof surface.

.10 Plywood and lumber nailer plates have been installed to walls and parapets as indicated.

3.5 PREPARATION OF STEEL DECK (CHANNEL TYPE)

.1 Install sound absorbing insulation in flutes of acoustical steel roof deck in accordance with deck manufacturer's instructions.

.2 Install sand in flutes of steel deck as indicated on drawings.

3.6 PRIMING CONCRETE DECK

.1 Not applicable to this project.

3.7 DECK SHEATHING

.1 Mechanically fasten sheathing to steel deck with screws spaced [400] mm oc each way.

.2 Place sheathing with long axis of each sheet transverse to steel deck ribs, with end joints staggered and fully supported on ribs.

3.8 ASPHALT APPLICATION

.1 Heat asphalt to obtain proper application temperature and viscosity at point of contact. The EVT temperature is the temperature when the asphalt attains a viscosity of 125

centistokes for hand mopping and 75 centistokes for mechanical application. To compensate for wind chill, ambient temperature and shading a tolerance of (±15º C) (±25ºF) is allowed. Keep asphalt in constant use to prevent distillation. If heating temperatures are not supplied on the containers or bills of lading for the asphalt on site heat to no more than 246ºC (475ºF) for Types II and III.

.2 In cold weather, insulate pump pipes and transport bitumen on roof in insulated carriers to minimize temperature fall back between kettle and point of application.

.3 Bitumen shall not be heated to flash point or held at final blowing temperature for more than 4 hours to prevent asphalt fallback.

.4 Unless otherwise specified by Manufacturer literature use the following E.V.T. temperatures.

.1	Mechanical Application	Mop Application
.2	Type II 400ºF (±25ºF)204ºC (±15ºC)	Type II 400 ºF (±25ºF)204ºC (±15ºC)
.3	Type III 450ºF (±25ºF)232ºC (±15ºC)	Type III 425 ºF (±25ºF)218ºC (±15ºC)

.5 Maintain constant supervision of tankers kettles to ensure that bitumen is not overheated. Check temperature of bitumen in kettle at a minimum of 30 minute intervals with an accurate thermometer. Maintain a record of bitumen temperatures.

.6 Do not place kettles on the roof without obtaining written permission from Owner and insurance underwriters. Where permission is granted, in addition to the requirements outlined in these documents, higher safety and insurance limits may be imposed. Any additional cost to meet these requirements will be at the Contractor's expense.

.7 Install all bitumen in a uniform continuous application insuring good adhesion is achieved. For #15 felts, apply at the rate of not less than 1.0 kgs./m^2 (20 lbs./100ft^2) per ply and for glass felts not less than 1.2 kgs./m^2 (25 lbs./100ft^2) per ply. Insure that bitumen bleeds out from both sides of the roll not less than 13mm (0.5").

.8 Use Type II for slopes up to 127mm/m (1.5"/ft.) (1:8).

.9 Use Type III for slopes greater than 127mm/m (1.5" to 3.0"/ft.) (1:8 to 1:4) and for felt flashings.

3.9 ACOUSTIC DECK INSULATION APPLICATION

.1 Not applicable to this project.

3.10 PRIMER

.1 Prime masonry and concrete surfaces which will be in direct contact with asphalt at the rate of 0.15 L./m^2 (0.33 gal./100 ft^2) to CGSB 37-GP-15M. Ensure that surfaces are tack-free before proceeding.

.2 Limit quantity of primer at deck openings and points of termination to prevent bleedthrough to the building interior.

.3 Broom primer into surface.

.4 Re-prime all surfaces that become contaminated with dust or become marred due to their exposure to roof traffic or weather.

3.11 VAPOUR RETARDER

.1 Install one ply asphalt laminated sheet (kraft paper) conforming to

.2 CAN/CGSB-51.33-M80, Type 2 in adhesive with a ULC approved fire retardant adhesive at a rate prescribed by the manufacturer.

.3 The vapour barrier shall be fully sealed at all overlaps and to adjacent surfaces with the adhesive.

.4 The vapour retarder is to overhang all edges and be carried up verticals a minimum 6" to allow for the formation of a water cut-off and enveloping the insulation.

3.12 VAPOUR RETARDER (CONCRETE GYPSUM BOARD PLYWOOD DECK)

.1 Not applicable to this project.

3.13 AIR SEALS

.1 Install self adhering modified Bitumen air seals under wood blocking, over metal upstands and all points shown on drawings. Overlap with air/vapour barrier of the roof/wall junctions at all wall perimeter eaves and parapets.

3.14 INSULATION

.1 The base insulation shall be 86 mm of Polyisocyanurate insulation mechanically secured to the deck with 4 1/4" Trufast stainless or coated screws and plates to meet the requirements of FM 1-90. (5 fasteners per panel minimum or more as required by FM) At acoustic deck use prefinished screws to match deck color.

.2 Over top of the base insulation a layer of 13 mm high density fibreboard insulation is mopped in type 3 asphalt at a rate of 25# per 100 sq. ft.. At the parapet and flashing, the torchable recover board is to be mechanically secured to the back-up surface through the base layer of insulation.

.3 Insulation boards shall be installed with staggered joints so adjacent boards are butt together without gaps. Boards are to be cut at projections and perimeters to minimize heat loss at these locations. All joints in the 2 layers of insulation are to be off set a minimum of 6" (150 mm).

.4 At all drain locations, the base insulation shall be reduced by 1” (25 mm) in thickness to create an 8'x8' (2440x2440 mm) sump for positive drainage. Install tapered high density fiberboard sump from 1 ½” to ½” over 4’.

.5 Fasteners and plates used to secure the insulation to the roof deck must meet Factory Mutual 4470 Standard for wind uplift resistance I-90 and corrosion resistance. Trufast

fasteners and metal plates and/or an equal pre-approved by the Consultant prior to the Tender Closing Date.

3.15 TAPERED INSULATION: APPLICATION

.1 For all locations of tapered insulation, provide shop drawings from tapered insulation Manufacturer for Consultant's review prior to installation.

.2 Where shown on roof plan, install width and thickness of tapered fibreboard insulation shown on drawings over base insulation set in a solid coat of Type III asphalt. Allow for wood blocking to compensate for additional insulation thickness.

.3 At all drain locations, provide tapered fibreboard insulation to form a sump each side of drain to promote positive drainage as shown on drawings.

.4 Ponding water will not be permitted.

3.16 CONVENTIONAL MEMBRANE APPLICATION

.1 Ensure all substrate surfaces are dried by artificial or natural means before installation of membrane.

.2 The roof membrane is to be constructed from 1 ply #15 felt and 4 plies type IV felt with plies overlapping 698mm (27.5"). 3+1 or 2+2 applications are not acceptable.

.3 Roll and squeegee each ply into uniform solid layer of bitumen to obtain complete embedment.

.4 Install felts smooth, free of wrinkles, air pockets, fishmouths and tears. Coinciding end joints are not acceptable.

.5 All fishmouths in membrane are to be cut and worked into bitumen immediately while bitumen is still hot. Repair all fishmouths with an additional ply of glass felt extending minimum 150mm (6.0") in each direction of defect.

.6 Do not gang roll felts during application as this will result in the displacement of bitumen. Keep rolls minimum 2.0 metres (6.5 ft.) apart during application. Protect new membrane from wheel and foot traffic until bitumen is set.

.7 Install felts with the slope to prevent slippage of the roll due to gravitational forces starting at low point in continuous application to top of cants.

.8 Ensure that felts at inside and outside corners fit tight to all verticals without gaps. Seal membrane at top of cants with a continuous light coat of asphalt as work progresses. Cut membrane at all changes in plane to assure proper bond to surfaces.

.9 Extend felts to the top of cants at all vertical surfaces in a continuous operation to provide waterproof seal while bitumen is still hot. Secure membrane at 212mm (8.5") o.c. in center of insulation stop at the toe of the cant strip while bitumen is still hot prior to installing membrane flashings. Locate fasteners 38mm (1.5") from edge of overlapping plies. Glaze coat all felts with asphalt after securing membrane to insulation stops.

.10 Avoid coinciding end joints where possible. Terminating felts and cross strippings in ends is not acceptable. Use equipment and application techniques approved by Consultant.

.11 Install an additional two plies of fibreglass felt in solid bitumen to reinforce defects and lap joints where the membrane changes direction. Install an additional two plies of fibreglass felt in and 600mm (2'-0") beyond drainage sump and drainage channels.

.12 Install an additional 180gm/m^2 mop grade modified bitumen base sheet extending 200mm (8.0") beyond all areas where walkways, observation platforms or other apparatus are to be installed. Set base sheet in solid coating of Type III asphalt prior to gravelling area.

.13 Flashing application.

.1 Prior to installing the flashings, the roofing supervisor and foreman shall check, and approve the condition of the substrate. If required corrective action must be taken to rectify problem areas to the satisfaction of all parties. The start of work shall be deemed to constitute acceptance of the conditions governing the contract.

.2 Ensure substrate is dry before installation of membrane.

.3 At curbs, joints, parapets and verticals install 1 ply of base sheet flashing self-adhered to points shown extending 150mm beyond the toe of the cant and extending up and over to points shown. Ensure that membrane achieves solid contact and is left free of wrinkles, air pockets, fishmouths and tears. Overlap all end joints and corners minimum 150mm and ensure a positive watertight seal. Install in one meter lengths, cut from across the roll.

.4 Install 1 ply of granular surfaced cap sheet flashing, torched in place, extending 300mm beyond the toe of the cant, extending up and over to points shown. Work membrane into place with wet sponge to ensure that a permanent watertight seal is achieved. Leave finished product free of buckles, air pockets, fishmouths and tears.

.5 Prepare all overlaps with heat and trowel to fully embed the granules and obtain a continuous flow of bitumen.

.6 Overlap all end joints minimum 150mm. Install in 1 metre lengths cut from across the roll. Offset side laps of cap sheet roofing and cap sheet flashings by 50%.

.7 At inside and outside corners, carry first ply around onto opposite plane, minimum 150mm. Trim overlapping ply flush to corner. Fold over and secure cap sheet to outside faces and top of curbs with nails and caps at 225mm o.c. Secure the top of the membrane flashings at all vertical walls at 225mm o.c. with caps and fasteners most generally suitable. Seal the tops of all flashings and points of termination with modified sealant.

.14 Bituminous Surfacing

.1 Do not install bitumen and aggregate surface until membrane and membrane flashings are complete, inspected and accepted. Insure membrane and flashings asphalt have set prior to gravelling operation.

.2 Prior to installation of bituminous and aggregate surface carefully inspect and repair all defects and deficiencies in the membrane and flashings that was not corrected during the initial installation.

.3 Pour hot bitumen flood coat over entire surface without skips at a rate of not less than 3 kg./m^2 (60 lbs./100 ft^2). Apply full covering of gravel at the rate of not less than 24 kg./m^2 (500 lbs./100 ft^2). If skips are found, sweep back gravel and reflood area.

.4 Remove all loose gravel and embed a second full coat of bitumen and aggregate 5.0 metres (15'-0") at all outside corners of the building and 600mm (2'-0") back from all roof openings.

.5 Provide a double pour of asphalt and gravel at locations where ponding depth exceeds 6mm (0.25") to disburse water to nearest drain. Contractor is to include to repour 5% of the total roof area in the original bid.

.6 Repeat application of bitumen and aggregate over entire roof for total aggregate mass of 48 kg/m^2 (10.0 lbs./ft^2).

.7 Check areas with broom to ensure proper embedment of aggregate. Clean and repour all areas as required to obtain a minimum 40% of adhesion of aggregate into bitumen.

3.17 CANTS

.1 Install fibre cants over rigid insulation.

.2 Apply hot bitumen to receiving surface and embed cant firmly by hand.

.3 Angle cut cants to fit tightly on back and bottom where roof to wall angle varies from 90E.

3.18 ROOF DRAINS

.1 Ensure roof drains are properly secured and set to permit positive roof drainage. Lower or extend mechanical services required to conform to specified requirements and design intent.

.2 Coat drain flange to receive roofing solid with modified mastic and install 1 ply #15 felt in the sump as an underlay to the membrane laid with a solid coat of hot bitumen. Lay membrane roofing including the cap sheet continuously through sump and over roof drain flange. Neatly trim felts to interior face and seal inside face with modified mastic.

.3 Set clamp ring in solid bed of modified asphalt sealant and secure clamp ring as dictated by drain design immediately after membrane is installed. Tighten bolts to ensure a permanent watertight seal. Install drain screen and gravel guards to details and manufacturer instructions.

3.19 PLUMBING VENTS, STACKS AND SLEEVES

.1 Inspect and clean soil pipes of debris to insure they are open. Make all roof penetrations air/water tight by installing a flexible membrane extending minimum 150mm beyond pipe onto overlay. Cut hole in membrane and pull over pipe to provide tight fit, tighten with clamp and seal with caulking. Alternatively at projections foam deck at pipes with polyurethane foam.

.2 Trim bitumen membrane 25mm from openings to prevent bitumen from dripping.

.3 Set metal flashings on top of completed membrane roofing.

.4 Set and cover flanges to receive roofing solid with modified sealant.

.5 Flash all flanges with three plies of felt laid solid with bitumen. Install first ply 25mm from upturn, and continue 150mm onto roof, second ply 225mm and third ply 300mm beyond flange.

.6 Coat finished surface of membrane immediately upon installation.

.7 Co-ordinate work with appropriate section to ensure that pipes are adjusted to flashing heights by either cutting down or extending pipes with matching materials attached with mechanical couplers. Ensure pipe is minimum 25mm higher than flashing sleeve. Insulate all sleeves, except unit heater stacks, with loosely packed glass fibre insulation. Seal openings between flashings and pipes with caulking sloped to shed water

.8 Install telescoping caps on soil pipes sealed solid with caulking to prevent condensation traps. Install vandal proof caps to manufacturer's requirements.

.9 Roofing Contractor to supply and install all sleeves, caps and rain collars on mechanical equipment. Unit heaters, etc. Design and fabricate collars to match material to which it is to be attached. Solder rain collars up to .559 mm and weld .711mm or heavier.

.10 Replace all damaged flashings and poorly fitting collars.

.11 Protect exposed surface during roofing operation and clean surfaces free of bitumen before leaving site.

3.20 CONCRETE PAVERS

.1 Install concrete pavers where shown to requirements of Summary of Work, drawings and details.

.2 Install paver on a 38mm (1.5") thick layer of extruded polystyrene insulation underscored in both directions at 150mm (6.0") o.c. to allow for drainage and venting. Cut insulation 38mm (1.5") smaller on all sides than paver so overhang protects insulation from direct sunlight. Build up gravel at edge of paver for additional protection to insulation.

.3 When bolting wood or equipment to pavers pre-drill holes through paver and install bolt from underside through to top and secure equipment with washers and nuts. Countersink bolt heads to protect membrane.

.4 Gas line supports including concrete paver bases shall be supplied by Division 15

.5 Quantity: as shown on drawings and to be site verified by the Consultant

3.21 ROOFING NEW TO EXISTING

.1 Applicable to new cuts in existing roofing at new mechanical unit penetrations. Refer to drawings for locations.

.2 Make good existing roof, membrane flashing, and metal flashing. Scrape back existing roof surface minimum 18 inches (450 mm) along the entire perimeter involved, repair

surface as required, due to scraping operations. Provide all cant strips, expansion joint filler, new roof membrane, membrane flashings, and provide new roof surfacing all as detailed and/or directed by authorized owner's representative.

.3 Materials for the reinstatement of existing roof must be compatible with existing materials.

.4 Make good existing roofing, flashing membrane and sheet metal counter flashings to the satisfaction of owner's authorized representative.

.5 Special job conditions are anticipated and will require full co-operation and co-ordination. Provide all miscellaneous materials and labour as directed.

3.22 FIELD QUALITY CONTROL

.1 Inspection and testing of BUR application will be carried out in accordance with Section 011100 – Summary of Work, section 1.43.

3.23 PROTECTION OF COMPLETED WORK

.1 Ensure membrane is undamaged before application of protection board.

.2 Apply protection board to cover membrane at locations as indicated.

3.24 CLEANING

.1 Keep the premises free from accumulation of waste materials or rubbish at all times. Stock piling of debris on the roof will not be permitted.

.2 Leave roof clean of debris and bitumen left by spills and machine tracking.

.3 Leave grounds and building free of debris and bitumen spread by pedestrian traffic where applicable. Rake out excessive piles of aggregate and trim to neat, even surface.

.4 Clean surfaces and penetrations of all contaminants and touch up to the satisfaction of the Owner. Include roof top equipment, curbs, soil stacks, sleeves, gas lines, vents, drains, ladders and walls.

.5 Check drains to ensure they are functional and where required remove all debris by vacuum.

.6 At the completion of the work remove all rubbish, tools, equipment and surplus materials.

.7 Be responsible to repair and pay all costs and fees required to rectify damage caused by work of this Contract with materials and finish to match original.

END OF SECTION